ABSTRACTS BOOK

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EUROPEAN MUSCULO-SKELETAL ONCOLOGY SOCIETY

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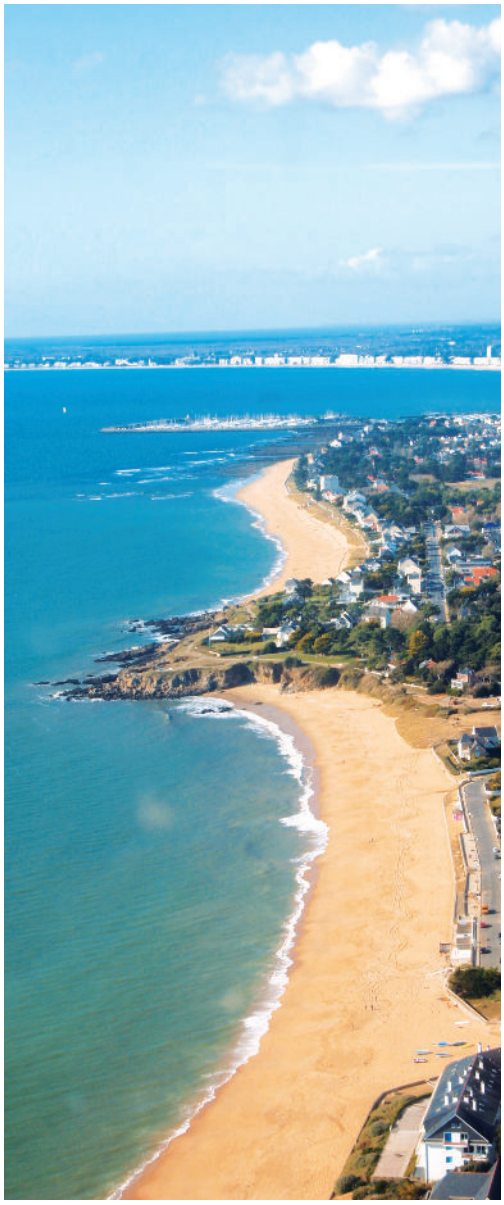

2016

25th, 26th, 27th May

La Baule

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FRANCE

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SESSION 1
EWING SARCOMA

Imaging study of 33 small cell osteosarcomas.

Abstract ID : 1053
Submitted by : daniel vanel the 2016-01-08 14:34:42
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Small cell osteosarcoma is a very rare type of osteosarcoma, mimicking histologically a Ewing sarcoma. We present his imaging pattern.

Out of 2500 osteosarcomas of our files, an histological review confirmed 34 small cell osteosarcomas. Imaging studies were available in 33 cases. There were 19 females and 14 males aged from 7 to 72 years. Four were over 50 years old, the others under 25.There were 30 radiographs, 4 tomograms, 19 CT and 15 MRI. Their results are presented.

Long bones were involved in 28 cases, mainly distal femur (8), proximal tibia (7) and proximal humerus (3). Lesions were metaphyseal (18) and/or diaphyseal (15). Lesions involved rarely axial bones (pelvis : 3, scapula :1, vertebra : 1). All were lytic, but a sclerotic component was visible on 19 cases, corresponding to bone formation and never cartilaginous type calcifications. Lesions were aggressive, with a distroyed cortex, soft tissue extension, periosteal reactions (27, perpendicular : 10) and poor limitation (3 : 31). There were usually central. Skip lesions were visible in 4 cases, multiple lesions in 3 cases, including one multicentric presentation.

The imaging pattern of a small round cell osteosarcoma is very often typical of an osteosarcoma, because of the sclerotic component made of bone, or the metaphyseal location in the knee. The radiologist is very useful to the pathologist. In the rare dubious cases, genetic tests on the biopsy usually solve the problem.

Keywords : osteosarcoma. Ewing.imaging. differential diagnosis.
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Speaker : Yes

Targeting the epigenetic readers in Ewing sarcoma inhibits the oncogenic transcription factor EWS/FLI1

Abstract ID : 1156
Submitted by : Camille JACQUES the 2016-02-08 15:15:30
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Ewing Sarcoma is the second most common primitive malignant bone tumor after Osteosarcoma. This childhood cancer is defined by a chromosomal translocation leading to the production of a chimerical transcription factor, EWS-Fli1, which is implicated in the progression of this malignancy. As current treatments improve its outcome, therapeutic resistances remain, leading to the patient's relapse. It is thus important to develop new therapeutic approaches and the recently synthesized molecule JQ1, an inhibitor of the BET bromodomain proteins could be a new original weapon in this context. The BET proteins family encompasses four members (BRD2, BRD3, BRD4 and BRDT) interacting with acetylated histones to regulate the chromatin accessibility to transcription factors and RNA polymerases. As JQ1 was recently shown to reduce the transcription of "super-enhancers"-dependent-genes such as oncogenes, which are highly sensitive to the BET proteins presence, it sounds relevant to hypothesize that EWS-Fli1's expression depends on the activity of these proteins.
Material &Method
The viability, the clonogenic capabilities, the migration potential as well as the cell cycle-repartition of the Ewing Sarcoma cells were studied in vitro consequent to a JQ1-mediated BET Bromodomain inhibition treatment. The ability of JQ1 to induce the cell death was also assessed in our model by the dosage of the caspase 3/7 activity and by the evaluation of the PARP cleavage. Using a Ewing Sarcoma nude mice model, intra-peritoneally injected by JQ1 at 50mg/kg twice a day, the effects of this molecule were assessed on both the tumor growth and the animals overall survival. Tumor samples were paraffin-embedded and the proliferative potential of the cells within the tumors, the apoptosis and the vascularization were evaluated by immunohistochemistry staining. The expression of EWS-Fli1 and some of its transcriptional target-genes (NR0B1, Gli1, VEGFA, p21, FOXM1, CCND1) were evaluated by RT-qPCR and Western blotting in vitro and in vivo and the direct regulation of EWS-Fli1 expression by BRD4 was checked by ChIP-qPCR.

Results
We demonstrated that the JQ1-mediated inhibition of the BET Bromodomains reduces the viability, the migration potential and the clonogenic capabilities of the Ewing Sarcoma cells as well as it leads to a G1-phase blockade. JQ1 also induces a dose- and a time-dependent apoptosis mediated by the caspase 3/7 and resulting in the PARP cleavage. In vivo, it delays the tumor growth and improves overall survival of the treated-mice. Our histological analyses also show thatJQ1 reduces the vascularization and the cell proliferation within the tumors, as well as it induces a caspase-dependent apoptosis. Those effects are correlated to the associated silencing of EWS-Fli1 and the consequent modulation of some of its target-genes resulting from the depletion of BRD4 from the EWS-Fli1 promoter.
Conclusion
Our results shed light on the BET bromodomains' role as essential regulators of the Ewing Sarcoma carcinogenesis. These proteins are indeed required to control EWS-Fli1's expression, consequently impacting its downstream signaling, which is functionally decisive for the maintenance of the tumorigenic features of these cancer-cells. Thus, the BET bromodomain proteins appear as promising therapeutic targets in the Ewing tumors context.

Keywords : Bromodomain, JQ1, EWS-Fli1, Ewing Sarcoma, Epigenetic
Authors :
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Improved Prognosis for Patients with Ewing Sarcoma in the Sacrum Compared with the Innominate Bones: The Scandinavian Sarcoma Group Experience

Abstract ID : 1161
Submitted by : Otte Brosjö the 2016-02-09 08:16:44
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

BACKGROUND:
Treatment of Ewing sarcoma of the pelvic bones remains one of the most difficult tasks in the treatment of bone sarcomas. Whether surgery or radiation therapy is the best local treatment is still a matter of debate. The aim of the present study was to compare sacral and nonsacral sites with regard to the treatment and outcome of pelvic Ewing sarcomas.
METHODS:
Patients with Ewing sarcoma of the osseous pelvis diagnosed between 1986 and 2011 were identified through the Scandinavian Sarcoma Group registry. Data regarding tumor size, local treatment (surgery or radiation therapy), metastatic disease, surgical margins, local recurrence, and overall survival were analyzed.
RESULTS:
Of the 117 patients examined, eighty-eight had tumors in the innominate bones and twenty-nine, in the sacrum. Radiation therapy was the sole local treatment for 40% of the innominate bone tumors in contrast to 79% of the sacral tumors. The five-year disease-free survival rate in the latter group (66%) was greater than that in the group with tumors in the innominate bones (40%) ($p = 0.02$ adjusted for size).
CONCLUSIONS:
Disease-free survival among patients with Ewing sarcoma was improved when the tumor was localized in the sacrum compared with the innominate bones, where these tumors are generally larger. Local radiation therapy alone appears to result in good local tumor control and may be the treatment of choice for sacral tumors.

Keywords : Pelvic Ewing, local control
Authors :
References : , , ,

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Chemotherapy-induced necrosis in Ewing sarcoma: which is the best scoring tool ?

Abstract ID : 1166
Submitted by : Piero Picci the 2016-02-09 11:42:07
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION AND AIMS
It is well known that chemotherapy-induced necrosis is a major predictive factor in Ewing sarcoma.
Different classification systems for histologic evaluation of necrosis have been adopted which are used to tailor post-induction chemotherapy. The most commonly used systems are based on the percentage of viable tumor (pure percentage, with 90% threshold for good and poor responder), amount and type of necrosis and presence of viable tissue (Huvos system: poor response, grade 1 and 2; good response grade 3 and 4), and evaluation of the true amount of viable tumor (Bologna System: poor response, grade1 macroscopic foci; good response grade2 microscopic foci and grade 3 no tumor).
The first 2 systems are derived from the methods utilized to evaluate necrosis in osteosarcoma, whilst the third one (Bologna system) was specifically adopted for Ewing sarcoma.
Aim of this work is to compare the predictive impact on Disease Free Survival (DFS) of the 3 different systems for grading necrosis.

MATERIAL AND METHODS
Histological maps of 474 localized Ewing sarcoma of bone treated at the Rizzoli Institute between 1982 and 2012 were reviewed to analyze response using the 3 different methods. All patients had received pre-op chemo and surgery (without pre-op radiotherapy) and post-op chemo, following 5 consecutive protocols.

RESULTS
At a median follow-up (for surviving patients) of 160 months (range 24-380), DFS for all patients is 58%, whilst the overall survival is 64%. Data were analyzed only in terms of DFS in consideration of the fact that post relapse treatment could bias the impact of necrosis.
All 3 systems showed a highly statistically impact on DFS with a $p<0.0001$, but with some differences in terms of percentages, and chi square value, as reported in Table 1:

System POOR Response DFS GOOD Response DFS Chi square
Percentage < 90% 38,1% => 90% 69,2% 48,96
Huvos 1 - 2 37,2% 3 - 4 69,3% 52,33
Bologna 1 37,6% 2 - 3 73,4% 67,24

A second evaluation revealed that none of the patients classified as poor responder with Percentage or Huvos Systems was classified as good responder with the Bologna System, whilst 36 good responder pts with Percentage between 90 and 99 were considered grade 1 (poor responders) with Bologna System (and other 91 were considered grade 2). The same was seen for 41 cases classified as good responders by Huvos grade 3, which using Bologna system were classified as grade 1 and grade 2 in 91 pts. The results are reported in the 2 figures.

CONCLUSION
All 3 Systems offer good predictive value for DFS in Ewing sarcoma. All 3 Systems are very similar in defining poor responders (Percentage < 60%, Huvos grade 1 and 2, Bologna 1), whilst the Bologna System seems to better stratify those patients with necrosis between 90 and 99% and Huvos grade 3.

Keywords : Ewing sarcoma, necrosis, preoperative chemotherapy
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/90-99-compared-to-bologna.pdf, http://sites.altilab.com/files/122/abstracts/huvos-3-compared-to-bologna.pdf
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Extending European collaboration to improve outcomes from Ewing sarcoma – the EURO EWING Consortium (EU grant 602856)

Abstract ID : 1200
Submitted by : Whelan Jeremy the 2016-02-11 12:22:08
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

About 60% of Ewing sarcoma (ES) patients achieve long-term survival with current treatment but there has been no improvement in this proportion for 25 years. Outcomes may be improved through (i) clinical trials, (ii) collaborative research. Widening collaboration to include the voice of patients may be beneficial.

Methods

Members of the European ES research community were awarded a Framework Programme 7 European Union grant to support the formation of the EURO EWING Consortium (EEC). The EEC is a coalition of 20 Partner organisations across nine countries in Europe and was awarded €5.7million for a period of five years. Two trials were opened: Euro Ewing 2012 for newly-diagnosed ES patients, and rEECur for patients with recurrent or primary refractory ES. Alongside the trials, processes were established for the collection and analysis of tissue samples at an international level. Patient and public representation was sought through national charities and support groups.

Results

The EEC has improved collaborative research, especially translational research in ES. The EEC has encountered numerous bureaucratic hurdles which have delayed the opening of the two trials but they are already, or will soon begin recruiting patients, in the UK, Spain, France, Italy, Belgium, Norway, Denmark, Finland and the Czech Republic. Partners in the EEC meet regularly for face-to-face meetings and by teleconference thus enhancing collaboration. Translational research opportunities have been extended beyond the original proposal and pilot biomarker studies using miRNAs and circulating tumour DNA have been performed. Recruiting patient experts to the EEC has been challenging and the majority of representatives are from the UK where there is a long-embedded and cohesive patient and public involvement programme in medical research.

Conclusion

The EEC has shown that a collaborative approach can benefit ES research but that achieving the aims is, and will continue to be, a challenge due to the difficulties of working within the varying regulatory requirements across Europe.

Keywords : Ewing sarcoma, collaboration, clinical trials, translational research, European
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Temozolomide and irinotecan in adult patients with recurrent Ewing Sarcoma

Abstract ID : 1212
Submitted by : Stefano Ferrari the 2016-02-11 18:20:13
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: The activity of temozolomide (TEM) and irinotecan (IRI) in recurrent Ewing sarcoma has been shown in retrospective studies mostly based on pediatric population. This joint study has focused on the use of TEMIRI in an adult population of patients with recurrent Ewing sarcoma.
Methods: Three referral centers participated to to the study. Patients receiving TEM (100 mg/m2/day orally) and IRI (40 mg/m2/die IV), day 1 to 5, every 21 days, and with measurable disease were eligible. Daily oral cefixime was used to reduce irinotecan-associated diarrhea
Overall response rate (ORR: CR + PR) and , 6-mo PFS were assessed.
Results: 38 patients (Male/Female ratio 2.2, median age 28 (18-65)).
ECOG 0: 21 (55%), ECOG ≥ 1: 17 (45%). 27 (71%) patients had received 2 or more chemotherapy lines for recurrent disease. High dose chemotherapy (HDT) with PBSC support had been previously used in 10 patients. Multiple sites of metastases were reported in 27 (71%) patients, 8 had only lung metastases and 3 bone lesion with soft tissue component.
Median number of cycles was 5 (range: 1-33).
No toxic death was recorded, grade 3-4-chemotherapy toxicity was reported in 4 patients (2 hematological, 2 gastrointestinal toxicities).
ORR: 13 (34%) patients had measurable tumor response (CR 2, 11 PR). Stable disease was reported in 13 (34%) patients, tumor progression was reported in 12 (32%) patients
6- month PFS rate was 44% without differences according to sex, number of lines of treatment, ECOG status, previous treatment with HDT.
Conclusions: In adult patients with recurrent Ewing sarcoma TEMIRI is an active regimen with a good toxicity profile.

Keywords : Ewing Sarcoma Temozolomide Irinotecan
Authors :
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Ewing sarcoma of the head and neck: local treatment evaluation, of the French population of Euro-Ewing99

Abstract ID : 1249
Submitted by : jebrane bouaoud the 2016-02-13 15:51:49
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background. Ewing Sarcoma (ES) is the second most common primary bone malignancy in child and adolescent. ES of the head and neck is rare [1-15% of all ES]. Few studies described its management while local treatment for head and neck ES is challenging. Objectives. To describe the characteristics, as well as local relapse, survival and acute and long-term functional and esthetic outcome, according to the choice of local control modalities. Method. We analyzed prospectively collected data of the French patients with head and neck ES registered in the Euro-Ewing 99 (EE99) trial from 1999 to 2014 and retrospectively reviewed their charts to refine some items on local treatment and sequels. Event-Free (EFS) and Overall survival (OS) were calculated with the Kaplan–Meyer method. Literature review was performed by a PubMed search.
Results. Overall 56 patients presented head and neck ES, confirmed by FISH or RT-PCR in all cases. Median age was 13.2 years [1,2-32,4 y]. Primary tumor mainly of the bone (90%) had usually small initial volume (<200ml; 92% of cases), were located in the skull (52%), mandible (20%) and maxilla (8%), with local, regional or metastatic extension, in respectively 82%, 10% and 8% of cases. After neoadjuvant chemotherapy (VIDE for 20 weeks [18-32 weeks]), local treatment consisted on combined surgery/radiotherapy (60%), surgery alone (22%) or exclusive radiotherapy (18%). The median follow up was 67 month. Seven and five patients had local (13%) and metastatic (9%) recurrences, within a median time of 22 months [13-34 months] and 33 months [6-83 months] after the start of chemotherapy. Local relapses occurred after surgery/radiotherapy (n=7/23 patients), surgery alone (n=3/13patients), or exclusive radiotherapy (n=2/7 patients). The 3-years, EFS and OS were respectively 80% [64-89%] and 86% [70-93%], for the all population of the study; 81% [65-90%] and 88% [72-96%] for localized head and neck ES.
Discussion. Survival of the French Head and Neck ES is comparable to the survival observed in the German Head and Neck ES similarly treated with the EE99 protocol. Local treatment indications, contraindications, and short term and long-term complications will be described after radiological review. Prognostic factors of local relapse will be studied after also further review of the margin quality with the new Euro-Ewing2012 pathological report, and of the radiation fields. These complementary data and survival according to treatment modalities will be presented at the EMSOS meeting.

Keywords : Ewing sarcoma, head and neck, local control, survival , sequels
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-es-baule-2016-nk-ngr-ngr.docx, http://sites.altilab.com/
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Local control and survival in pelvic Ewing sarcoma (EwS) in the Euro-EWING99 trial

Abstract ID : 1296
Submitted by : Dimosthenis Andreou the 2016-02-14 18:38:01
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: Approximately 20% of EwS are localized in the pelvis and have a poorer prognosis, compared to tumors localized in the extremities. The aim of the study was to identify factors associated with local recurrence (LR) and overall survival (OS) in patients undergoing multimodal treatment.
Methods: We performed a retrospective analysis of the medical files of 335 patients with newly diagnosed EwS registered in the Euro-EWING99 trial from centers in Germany, Austria, Belgium, the Czech Republic, the Netherlands and Switzerland between 1998 and 2009. The primary outcome was local recurrence-free survival (LRFS), defined as the interval between diagnostic biopsy and LR. A secondary outcome was OS.
Results: 53% of the patients presented with localized tumors and 47% with primary metastases. With a median follow-up of 3.1 years in all patients and 6.3 years in survivors, LRFS was 70.4% at 5 years, and OS was 46.7%. Primary tumor volume ≥200ml (p=0.022/p=0.001) and primary metastases (p=0.003/p<0.0001) were associated with a poorer LRFS and OS, while tumor regression ≤ 90% after neoadjuvant treatment (p=0.253/p=0.0001) and deviations from protocol treatment (p=0.761/p=0.041) were only associated with a poorer OS.
Patients who had received surgery and local radiotherapy had an improved LRFS and OS compared to patients who received surgery alone (p=0.009/p=0.005) or local radiotherapy only (p<0.0001/p=0.0002). Among patients who underwent surgical treatment, complete removal of the involved hemipelvis was associated with improved LRFS (p=0.007) and OS (p=0.001). Patients with >90% histological response to neoadjuvant treatment (n=118) had a higher LRFS (p=0.04) and OS (p=0.012) after a combined local treatment with surgery and radiation treatment, compared to patients undergoing surgical treatment only. Only a trend in OS (p=0.07) and no differences in LRFS (p=0.564) were detected in patients with ≤ 90% response (n=38).
Intralesional resection was associated with a poorer LRFS and OS than marginal (p=0.028/p=0.012) and wide or radical resection (p=0.001/p=0.001). Patients with bone tumors and soft tissue infiltration prior to surgery had a poorer OS (p=0.003) and a trend for a poorer LRFS (p=0.072). Additional local radiotherapy (n=58) was not associated with a significantly improved LRFS (p=0.104) or OS (p=0.095) compared to surgery alone (n=30) in these patients, with the numbers of patients available for this analysis.
Conclusion: Patients with pelvic ES seem to benefit in terms of local control and OS from a complete removal of the involved hemipelvis and a combined local treatment consisting of surgical resection and radiotherapy, even in cases with >90% response to neoadjuvant treatment. Persisting soft tissue infiltration prior to surgery appears to be a simple but important clinical prognostic factor in terms of survival.

Keywords : ewing sarcoma, pelvis, local control, survival, prognostic factors
Authors :
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Risk analysis factors for local recurrence in Ewing sarcoma: When should adjuvant radiotherapy be administered?

Abstract ID : 1299
Submitted by : Michael Parry the 2016-02-14 18:50:00
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Patients with Ewing's sarcoma require multimodal therapy with systemic chemotherapy and local control. Surgery and adjuvant radiotherapy has become the preferred method of local control, although radiotherapy alone is an acceptable alternative. The aim of this study was to analyse a group of patients with non-metastatic Ewing Sarcoma at presentation looking at various prognostic factors affecting local recurrence (LR).
Methods: A retrospective review of all Ewing sarcoma patients treated between 1980-2012 was done. Only patients treated with neo-adjuvant chemotherapy followed by surgery and/or radiotherapy were included. Patients were grouped according to site (central or extremities) for further analysis of prognostic factors.
Results: A total of 388 patients were included in the study. 5 year overall survival (OS) was 72% and 5 year local recurrence free survival (LRFS) was 83%. Sixty patients (15%) developed local recurrence at a median time of 19 months (range 7 to 150 months). Patients who developed LR only as the initial event (54% 5yrOS) or along with metastases (14% 5yrOS) presented with worse survival than without LR (78% 5yrOS, $p<0.0001$). For central tumors, size and response to chemotherapy were found to be significant factors for developing LR. For extremity tumors, chemotherapy response did not affect the rate of local recurrence. Intralesional and marginal resections significantly increased the risk of LR. Adjuvant radiotherapy in marginal resections significantly reduced the risk of local recurrence (5y LRFS: 96% vs 81 / $p=0.044$).
Conclusion: Local recurrence significantly affects survival in Ewings sarcoma. Histological response to chemotherapy was not found to be a significant prognostic factor for local recurrence for extremities tumours. We recommend consideration of adjuvant radiotherapy in intralesional and marginal resections.

Keywords : Ewing's sarcoma, Local recurrence, Prognosis
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Radiological tumour volume response and relation to histological response and outcome in localized Ewing Sarcoma

Abstract ID : 1348
Submitted by : Lianne Haveman the 2016-02-16 14:46:48
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives

The treatment of Ewing sarcoma (EwS) patients consists of induction chemotherapy followed by local therapy (surgery and/or radiotherapy) and maintenance chemotherapy. For most patients, MRI is considered to be the imaging modality of choice for local staging and response evaluation of treatment. Very limited data are available concerning the correlation between radiological response, histological response and survival.

Methods
Data was analysed from 241 localized EwS patients included in the Euro-Ewing 99 trial, in which 3D MRI was used to determine tumour volume at diagnosis and repeated at least once during induction chemotherapy. Change in tumor volume was expressed as percentage reduction. Tumour volume response was determined during the early induction phase (1-3 courses of chemotherapy; n=195) and during the late induction phase (4-6 courses; n=175). A distinction was made between adequate response (reduction≥67%) and inadequate response (<67% reduction or progressive disease). Correlation of radiological response categories with histological response, event free survival (EFS) and overall survival (OS) was analysed with chi-square tests and logrank tests.

Results
During the early induction phase, 149/195 (=41%) patients showed an adequate radiological response. 177 of the 195 patients received surgery, a good histological response (<10% viable cells) was seen in 122/177 of these patients (=69%). In this group of patients, no significant correlation (p=0.81) was shown between radiological and histological response. Furthermore, radiological response did not significantly correlate with EFS (p=0.99) and OS (p=0.24). During the late induction phase, 74% of patients showed an adequate tumour volume response. Additionally in this group of patients, no correlation was seen between tumour response detected by imaging and histological response, OS and EFS. Patients who exhibited a good histological response and patients who had tumour volumes <200ml at diagnosis showed significantly (p<0.05) better survival rates compared to patients who exhibited an inadequate histological response and those who had tumour volumes >200ml.

Discussion/Conclusion
In this study, tumour volume response was neither a predictive marker for histological response nor a prognostic marker in terms of survival. On the basis of these results, modification of induction chemotherapy due to an inadequate radiological tumour volume response does not seem justifiable, unless a significant progression is seen. However, histological response to induction chemotherapy and initial tumor volume indicate a direct relation to outcome.

Keywords : Ewing sarcoma, radiological response, outcome
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Early results with pre-operative radiotherapy for central Ewing's sarcoma

Abstract ID : 1365
Submitted by : Jonathan Stevenson the 2016-02-17 15:32:26
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives

Patients with Ewing's sarcoma require multimodal therapy with systemic chemotherapy and local control. Surgery and adjuvant radiotherapy has become the preferred method of local control, although radiotherapy alone is an acceptable alternative1. Central Ewing's sarcomas have a worse prognosis due to later presentation, larger size, increased incidence of metastasis at diagnosis and anatomical limitations of local control compared to limb Ewing's2. We aimed to review the early oncological results of preoperative radiotherapy for central Ewing's sarcoma at our institution.

Patients and Methods

The records of all 46 sequential central Ewing's sarcomas who received surgery between 2000 and 2015 were reviewed (36 pelvic, 6 spine, 4 thoracic). All patients received neo-adjuvant and adjuvant chemotherapy and underwent pre-operative staging according to international guidelines. Radiation was used pre-operatively in 12 patients since 2012; the remaining 34 patients underwent post-operative radiotherapy from 2000 to 2012. Pre-and postoperative radiation doses were in accordance with Euro-ewing 99 and 2012 protocols. We identified overall survival, time to local recurrence and metastasis and post-operative wound complications.

Results

The mean ages were 20 and 18 years in the pre and post-operative groups and median follow-up was 1.4 years and 2.7 years respectively. Good necrosis results (>90% necrosis) were observed in 11/12 pre-op patients and 19/34 post-op patients. There were 15 deaths in the post-op group, with a 5-year estimated overall survival of 55%, and 9 local recurrences. There were no deaths or local recurrences pre-op group (chi-squared test, p=0.04 and p=0.05 respectively). There was no statistical difference in time to metastasis between the two groups (p=0.09). Wound complications were observed in 6/34 of the post-op group and 3/12 of the pre-op group.

Conclusions

These early results suggest that pre-operative radiotherapy may have improved early local control and survival advantages compared to post-operative radiotherapy as part of multimodal treatment of central Ewing's sarcomas, without detrimental wound complication rates.

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Keywords : Ewing's sarcoma, pelvis, radiotherapy
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The surgical treatment of the Ewing sarcoma of the spine: long-term follow-up

Abstract ID : 1379
Submitted by : Carmine Zoccali the 2016-02-19 12:42:49
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION: Ewing sarcoma is the second most common primary malignant bone cancer in children and adolescents, after osteosarcoma. The most common primary sites of involvement are the pelvis, femur, and tibia. Primary spinal involvement is rare (5% of all cases).
The introduction of the new multiagent chemotherapy has consistently changed prognosis, nevertheless no evident consensus is present about the best local treatment between radiotherapy and surgical treatment. Our intent was to value the results at long-term follow-up of 15 patients surgically treated.

PATIENTS AND METHODS: all patients undergone surgical operation for Ewing sarcoma of the spine were reviewed. Our cohort was composed by 15 patients (average age 24 years, min 3 – max 65 year); the lesions were located from C4 until S2. In 12 out 15 patient wide margin was reached; in three case focal contaminations were present
RESULTS: at 6 years of average follow-up (min 1 – max 15), nine out 15 patients are apparently free of disease, two patients present lung metastases, one with and one without local relapse, 4 patients died because of the disease (two patients because of lung metastases at one and two years of follow-up and the other two with a widespread disease). The complications were transitory incomplete paraplegia resolved at 12 and 18 months in two cases and two surgical revision whereof one because of hardware failure and one for infection.
CONCLUSIONS: the surgical treatment of Ewing sarcoma consists in wide margin resection. This is true in spine as in inferior limbs. When the tumor is located in the vertebral bodies, surgery is technically difficult, nevertheless when wide margin is reached, Ewing Sarcoma of the spine can have a survival rate similar to the patients with Ewing sarcoma of the limbs. More studies with more patients are advisable to better verify our preliminary results.

Keywords : ewing sarcoma, spine tumor, en-bloc vertebrectomy, wide surgery
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Oncological outcome of Ewing sarcoma treated by limb salvage and neoadjuvant chemotherapy. The experience of Cairo university hospitals

Abstract ID : 1399
Submitted by : Walid Ebeid the 2016-02-21 09:14:32
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

In the period from 1994 to 2014 we have treated 173 patients with Ewing sarcoma. Only 139 patients were treated by limb salvage and neoadjuvant chemotherapy and were included in this study. The aim of this work was to evaluate the oncological outcome of Ewing sarcoma of bone that was managed by limb salvage and neoadjuvant chemotherapy.
60% were males (83 patients) and the average age was 15 years (range 2 – 77 years). The commonest site was the femur (31%) followed by the humerus (18%) and the tibia (16%). Patients underwent routine staging by local MRI and chest CT and bone scan as well as bone marrow biopsy. They received preoperative chemotherapy according to the POG 9354/CCG 7942 protocol. We used 5 drug regimen: vincristine, doxorubicin, cyclophosphamide, MESNA alternating with etoposide and ifosfamide. Cycles were given every 3 weeks and local control at week 12. The duration of treatment was 14 cycles. 30 patients had pathological fractures at presentation that healed during preoperative chemotherapy. 5 patients had chest metastases at presentation that disappeared during preoperative chemotherapy.
Limb salvage was done for all the patients using different reconstructive techniques according to the affected site (endoprosthesis, vascularized grafts, recycled grafts, etc). The average resection length was 16cm (range 2- 37). Postoperative radiotherapy was given to patients who had inadequate margins (6 patients) or patients who had less than 90% tumour necrosis (42 patients)
The average follow up period was 64 months (range 9 months to 20 years). 8 patients developed local recurrence (6%) in less than 3 years postoperatively. Only one of them survived after doing an amputation while the rest developed chest metastases and died. 20 patients developed chest metastases (14%). 17 of them where during the first 2 years postoperatively. Only one of them was a good responder to chemotherapy. None of them survived. The 5 years disease free survivorship was 86% while the overall survivorship was 85%. Survival analysis was done for the different outcome measures using Kaplan Maier statistics calculating the mean and median survival time for each group with their 95%CI and the corresponding survival graphs. All statistical calculations were done using computer program SPSS (Statistical Package for the Social Science; SPSS Inc., Chicago, IL, USA) release 15 for Microsoft Windows (2006).
Limb salvage and neoadjuvant chemotherapy for Ewing sarcoma offers an acceptable oncological outcome. Pathological fracture at presentation did not affect oncological outcome. Chest metastases at presentation and proximal tibial lesions were poor prognostic factors while good response to chemotherapy was a good prognostic factor.

Keywords : Ewing, neoadjuvant, limb salvage
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Results of surgical treatment of Ewing‘s sarcoma of the extremities.

Abstract ID : 1410
Submitted by : Philipp Theodor Funovics the 2016-02-21 15:51:20
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Aim of this study was to report our single-center experience with surgical resection of Ewing’s sarcoma of the extremities within a multimodality treatment approach.
Out of the Vienna Bone and Soft Tissue Tumor Registry we have identified 146 patients (58 females; 40%; and 88 males; 60%) with a Ewing’s sarcoma of the extremities. Mean age at time of surgery was 19 years (median, 16; range 4-67). Predominant tumor sites included the femur (54; 37%), tibia (36; 25%), fibula (22; 15%) and other skeletal lesions (27; 18%). Only seven tumors (5%) occurred in the soft tissues. 133 patients (91%) underwent tumor resection with or without reconstruction, primary amputation was indicated in 13 patients (9%). Adjuvant treatment included chemotherapy in all patients and radiation in 69 (47%). Overall, mean follow-up was 94 months (median, 44; range 1-500)
Three patients (2%) developed a local tumor recurrence, all of which were observed before 1999, with a 5- and 10-year LRFS of 97%. 21 patients (14%) presented with primary metastatic disease, 31 patients developed metastases throughout follow-up. Consequently, 5- and 10-year MFS was 72% and 69%, respectively, and the 5- and 10-year OS was 68% and 66%, respectively. In multivariate analysis only metastasis at diagnosis and, when omitting the latter, also local recurrence had a significant impact on OS.
The surgical treatment of extremity Ewing’s sarcoma remains challenging but results in excellent local tumor control rates. Local radiation seems important in cases of local recurrence or inadequate margins of resection, emphasizing the importance of an aggressive surgical approach.

Keywords : Ewing, sarcoma, extremity
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EMSOS 2016 - 29TH ANNUAL MEETING OF THE

EUROPEAN MUSCULO-SKELETAL ONCOLOGY SOCIETY

17TH EMSOS NURSE AND ALLIED PROFESSIONS GROUP MEETING

2016

25th, 26th, 27th May

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NURSE AND ALLIED PROFESSIONS PROGRAM

Quality of Life in Children and Adolescents after Lower Extremity Bone Tumor surgery.

Abstract ID : 1136
Submitted by : Willem Petrus Bekkering the 2016-02-05 16:49:12
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Background: Survival rates of patients with malignant bone tumors improved over the last decades. Similarly, various extremity salvage procedures became available leading to a decline of amputation rates. Quality of Life (QoL) is an important outcome measure in children and young adults after surgery for a malignant tumor of the lower extremity.
Methods: QoL scores in comparison with healthy peers, other pediatric cancer patients and differences between different surgical options will be presented based on current literature.
Results: Patients after lower extremity bone tumor surgery report significantly lower functional QoL scores in comparison with healthy peers and most other pediatric cancer patients. However, mental QoL scores appear to be better than scores in healthy peers. In the available literature, no consistent differences were reported between limb-salvage and ablative surgery. Prospectively, after two years since surgery no further improvements were achieved at functional QoL scores and mental QoL scores remain favorable in comparison with healthy peers.
Discussion: The implication of the data published so far for children and young adults is hampered by the selection of predominantly elderly patients and the lack of objective and child adequate measures. Furthermore, research is limited to generic QoL measures and disease specific measures with interest into sportive and cosmetic aspects that characterize bone tumor surgery are lacking. Different initiatives to improve QoL like earlier and extensive information provision, shared decision making and support groups will be presented.

Oral presentation (25 minutes) for nurses program

Keywords : Quality of Life
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Quality of care: methods to improve patients participation and personalized healthcare

Abstract ID : 1402
Submitted by : Petra Veldman the 2016-02-21 12:37:07
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Quality of care: methods to improve patients participation and personalized healthcare
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Introduction: According to the vision of Radboudumc, all patients participate in their own healthcare. Clinicians, researchers and patients work together to uncover the causes of diseases and find cures for them. In this way, participatory healthcare has become the focal point of patient care, education and research at Radboudumc.

Aim: Gain insight in the way doctors and nurse practitioner employ personalized healthcare in the outpatient clinic and optimize personalized healthcare.
Gain insight in te experience of patients during treatment and improve quality of care based on their feedback.

Methods: Video observation and professional observation in the outpatient clinic and patients reflection by using a mirror meeting.

Results: The observation sessions and mirror meeting resulted in a list of items to improve. These items were related to information and communication, procedures and organisation of healthcare.
During a year innovations were made. Some actions could be employed at once. Some items to improve had to be analysed before changes could be made. These items were transferred to projects, coordinated by a nurse practitioner.

Conclusions: By improving patients participation and personalized healthcare medical outcomes are improved, medical errors are reduced and patients satisfaction is increased.

Keywords : participatory healthcare
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Treatment of pain in pediatric oncology - still a challenge

Abstract ID : 1777
Submitted by : Susanne Berthold the 2016-03-30 09:20:39
Category : Nurse session
Typology : Au choix du comité de lecture / Choice of the reading committee
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Although there have been major advances in the treatment of pain management in children with cancer (first of all the World Health Organization‘s guidelines,1998) it is still complex and challenging to handle.
Pain in pediatric oncology has many different reasons, it could be tumor-related or caused by the side-effects of cancer treatment, so evaluation and alleviation of pain has to be our primary goal.
There are still a lot of fears and misconceptions, concerning especially the pharmalogical side of treatment, being the reason why many pediatric oncology patients suffer from unnecessary pain.
For this reason pain in children with an oncological disease should be approached with an understanding of the individual child and family situation as well as an open mind for variability in analgesic response.
Our role as a pediatric oncology nurse is to be partners with the patients and their families.We have to achieve high standards in education, research and compassion.
We don‘t want pain to be a common element in our daily business.For this reason we will repeat well-known facts in our presentation and we want to raise awareness of what good pain management could look like.

Keywords :
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Can a better communication reduce pain and anxiety level in amputees for bone and soft tissue sarcomas?

Abstract ID : 1476
Submitted by : Michele Boffano the 2016-02-22 18:27:16
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Introduction: Postoperative pain and anxiety affect heavily physical and psychological health of the patient undergoing a limb amputation for sarcoma. An amputation modifies the objectives and the perception of one's life. An adequate information to the patient could be the right strategy to reduce the anxiety and postoperative pain. The aim of this study is to evaluate the effects of a more accurate and specific preoperative information to reduce the anxiety and postoperative pain in patients with bone and soft tissue sarcomas where limb salvage surgery is not feasible.
Methods: A leaflet focused on nursing and general care has been developed to be given to the patients before amputation surgery for bone and soft tissue sarcoma. The leaflet illustrates: the change of body shape, the potential pain and its specificity (whether phantom limb pain or stump pain), the phantom limb syndrome (the patient usually perceive the amputated limb as if still attached and part of the body), the possible development of anxiety, depression, o psychological discomfort. A counseling activity by a trained nurse comprehends a full explanation of the timing and the main step-points of the prosthetic replacement of the limb, and a full explanation of the medical and psychological approach to the phantom limb syndrome and the phantom limb pain. The communication is adapted to the patient's social and cultural level.
Patients with bone and soft tissue sarcomas awaiting for a major amputation have been included in this study. Inclusion criteria: age range 18-75 years, no cognitive impairment, no previous amputation, no psychiatric disease. Patients were divided in 2 groups. Patients in group 1 received the leaflet, the counseling activity by the nurse, and the communication by the surgeon. Patients in group 2 (controls) received only the communication by the surgeon. In the 2 groups pain and anxiety level were recorded post-operatively at fixed time (3, 7, 15, 30, 60 days postop) using VAS (Visual Analogic Scale) for pain and HADS (Hospital Anxiety Depression Scale). All the patients have been treated with the Hospital drug protocol for phantom limb pain including Pregabalin 75 mg 1 tab tid, Duloxetine 30 mg 1 tab qd, Oxycodone-Naloxone 5 mg 1 tab tid for 40 days.
Results: Our preliminary results seem to show that the patients in Group 1 have a better pain control and a better acceptance of their new physical aspect after surgery. Phantom limb sensation and stump pain seem comparable in the two groups.
Conclusion: The purpose of our study was to fill a gap in the information moment of the oncologic patient while inpatient. A communication from specialized nurses could be more empathic and direct towards the patient. This approach cannot substitute the psychological support which should always be offered in an orthopaedic oncology centre. Our definitive results combined with the experiences among the main reference centres could represent a starting point for a shared operative protocol.

Keywords : amputation, phantom limb pain, anxiety, counseling, sarcoma
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Osseointegration: The experience of 8 patients in Leiden

Abstract ID : 1228
Submitted by : Nicolette Leijerzapf the 2016-02-12 12:53:51
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Osseointegration: The experience of 8 patients in Leiden

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Introduction: Bone anchored prosthesis based on osseointegration is an innovative treatment for amputees with socket problems due to their prosthesis.
Osseointegration for amputees has been performed in Sweden since 1990. The OPRA procedure, the Osseointegrated Prosthesis for the Rehabilitation of Amputees, includes two surgical stages followed by rehabilitation. The first stage (S1) is to place a titanium implant (the fixture) into the cavity of the bone. S2, the second stage, performed 6 months later; the abutment screw is inserted into the distal end of the fixture and protrudes through the skin. Also remodelling of the soft tissue must be performed. The goal of this procedure is to click the prosthetic limb directly onto the abutment screw without wearing a prosthetic socket.
The rehabilitation schedule, during 6 months, is managed by the OPRA protocol and physical therapists.
The rehabilitation physician and orthopaedic surgeon include the patient for the osseointegration. Contra indications are: arterial venous problems like diabetes, infections, obese, smoking, use of corticosteroids, recent malignant tumor, immunosuppressive therapy, renal failure and poor bone quality. Mental stability is very important.

Methods: In Leiden we started in September 2011. We treated 8 patients, 6 transfemoral , 1 transtibial amputee and 1 thumb amputee. The median age was 48 (31-66).Two patients had amputations due to a tumor and 6 due to trauma. The median follow up was 39 (27-50) months.

Results: Complications post-operative. Three patients had temporary wound problems. Two transfemoral amputees broke the abutment screw and had a revision after 27 and 40 months. The transtibial amputee had an osteomyelitis and lost his osseointegration after 15 months. One transfemoral osseointegration patient died because of cardiac problems. The thumb osseointegration had no complaints at all.

The quality of life of all the patients improved, they have no pain, a better walking pattern, easy click-fixation of the prosthesis and a new phenomenon: osseoperception.
They all wear their prosthesis seven days a week for the whole day > 15 hours. They all would choose again for the osseointegration procedure.

Conclusions: The transfemoral- and thumb osseointegration are reconstructions with a successful outcome in the quality of life. In our experience the transtibial osseointegration is not a good indication.

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Review of Sarcoma Follow Up in Nurse Led Clinics

Abstract ID : 1519
Submitted by : Lin Russell the 2016-02-25 12:25:40
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Objective:
To identify levels of patient satisfaction with a nurse led follow up clinic and to explore a patient's preferred follow up location.

Brief Description:
Patients attending the sarcoma follow up clinic who were being review by either Nurse Consultant or Advanced Nurse Practitioner were asked to complete a Trust validated questionnaire on their clinic experience. They were asked to rate their consultation on 5 categories; level of information, communication and listening skills, assessment and examination skills, the overall experience and satisfaction with being seen by a nurse rather than a doctor.
They were also asked where their preferred place of follow up would be, the Royal Orthopaedic Hospital, their local NHS Trust, their GP or to lead their own follow up. A reason for this choice was also requested.

Results:
41 questionnaires have been completed and data collection has been analysed. Results indicate high levels of patient satisfaction with the nurse led follow up service.
A majority of patients have indicated that they have a preference for follow up at the ROH, predominantly due to trust in the team and a positive patient experience.
In conclusion all patients were satisfied or very satisfied with the nurse led clinic.

Keywords : Nurse led clinics
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THE ROLE OF THE NURSE IN THE MULTIDISCIPLINARY TEAM OF A SARCOMA REFERENCE CENTRE

Abstract ID : 1477
Submitted by : Michele Boffano the 2016-02-22 18:34:45
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

INTRODUCTION: According to the most recent data, people who will develop cancer are set to increase. Unfortunately up to now, when an individual is suffering from cancer, he perceives this situation as a condemnation. This should give us the cue to try to improve the patient's life as well as his life expectancy and that of his family too. You can get good results just trying to manage the patient's course in a right and personalized way. The first basic step is to put the patient and his complexity at the centre of the system with the aim to offer the right answer from the point of view of efficacy, efficiency, appropriateness, empowerment and compliance.
METHODS: We considered the total of patients referred to our service and for whom it was organized a course that led to the diagnosis and subsequent treatment of the tumour (staging, biopsy, surgical and medical treatment, and follow up). In our Department of Orthopaedic Oncology in the period April 2013- March 2015 we took care of a total of 1225 patients. For each patient an individual course was set. It consisted of the first clinical examination, the Imaging studies for staging, the biopsy, the discussions of the multidisciplinary team, the first communication of the diagnosis, the preparation for the subsequent surgery and the communication after surgery to set up the proper follow-up or postoperative treatments.
RESULTS: We want to demonstrate that the presence of a nurse in a highly specialized and diversified group allows to streamline, to simplify and to speed up long and complex courses that lead to the taking in charge of the patient. Some of the results show the reduction of the waiting time for the diagnosis and for the relative instrumental investigations (about two weeks), the reduction of waiting time to prepare the surgery (within a few days in case of urgency or within ten, fifteen days in normal cases), the reduction of the costs of the tests paid by the hospital (a part of the course is managed as an outpatient), the simplification of the bureaucratic component, the constant contact with the wards for the issues of the hospitalization or with the institutes that will take charge of the patient later.
CONCLUSION: Certainly, the presence of the specialized nurse has brought considerable advantages within a so complex and difficult course. Beside the advantages, critical issues have emerged due to the strong specialization and specificity that the management of the cancer patient requires. Critical points to be taken into account for potential pitfalls or delays are the large geographical area of origin of the patients, the lack of the family-support around the patient, the pediatric patients, the urgency of the diagnosis, and the collaborations with different specialized figures often located in distant centres. A multidisciplinary discussion among the main reference centres is mandatory.

Keywords : multidisciplinary team, diagnosis, sarcoma, reference centre, organization
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Functional Ability and Physical Activity in Children and Adolescents after Lower Extremity Bone Tumor surgery.

Abstract ID : 1137
Submitted by : Willem Petrus Bekkering the 2016-02-05 16:52:35
Category : Nurse session
Typology : Communication orale / Oral communication
Status : waiting for validation
Authorisation to disclose : Yes/Oui

Background: Survival rates of patients with malignant bone tumors improved over the last decades. Similarly, various extremity salvage procedures became available leading to a decline of amputation rates. Functional ability and the level of physical activity are important outcome measures in children and young adults after surgery for a malignant tumor of the lower extremity. However, extensive research report disappointing outcome scores in comparison with healthy peers and other pediatric cancer survivors and has not been able to determine consistent advantages for either limb-salvage or ablative procedures.
Methods: Functional ability and physical activity scores in comparison with healthy peers, other pediatric cancer patients and differences between different surgical options will be highlighted based on current literature.
Results: Patients after lower extremity bone tumor surgery report significantly lower functional ability and physical activity scores in comparison with healthy peers and most other pediatric cancer patients. Furthermore, patients after bone tumor surgery report no consistent differences at physical ability and functional activity levels between limb-salvage or ablative surgery. However, different sportive choices were made based on the fragility of the reconstructed extremity. Prospectively, no further improvements were achieved after two years since surgery.
Discussion: The implication of the data published so far for children and young adults is hampered by the selection of predominantly elderly patients and the lack of objective and child adequate measures. Furthermore, research is limited to daily functioning and activities with very few interest into sportive and intensive activities that characterize childhood and adolescence. Different initiatives to improve functional ability and physical activity levels like oncological training and sportive rehabilitation will be presented.

Abstract for oral presentation (25 min) at nurses program

Keywords : Functional ability
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FREE COMMUNICATIONS 1

EFFECT OF BONE MICROENVIRONMENT IN JAW OSTEOSARCOMA DEVELOPMENT

Abstract ID : 1158
Submitted by : Françoise Redini the 2016-02-08 17:15:49
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Osteosarcoma is the most frequent malignant bone tumor in children and adolescents. Jaw osteosarcoma (JOs) differs from the long bones osteosarcoma (LBOs) in an onset two decades later and a lower metastatic potential with better survival. The treatment of the JOs remains complicated because of the aesthetic and functional disabilities due to the surgery. The aim of our work is to develop for the first time a preclinical model of JOs in order (i) to investigate the potential role played by the bone microenvironment in the JOs development, and (ii) to understand a different clinical behavior as compared with LBOs.
Materials and methods: Using syngenic and xenogenic models from mouse and human osteosarcoma cell lines, and a tumor xenograft induced by patient derived JOs biopsy, we developed jaw osteosarcoma models in mice. The jaw model was compared to the tibia induced osteosarcoma model and characterized according to clinical parameters (tumor growth, metastasis dissemination), microCT imaging and histologic settings. A comparative analysis of bone markers at transcriptomic and immunohistochemical levels was carried out between the two locations. The protein expression in bone microenvironment was comparatively studied in human biopsies from jaw and long bones osteosarcomas by using tissue micro-array (TMA). Zoledronic acid targeted therapy was realized in jaw osteosarcoma model looking for a possible effect on the tumor growth and the metastatic development.
Results: The tumor growth was higher in the tibia induced osteosarcoma site than in the jaw site mostly in the xenogenic model. Lung metastases were found in both models without correlation with the tumor volume. The morphometric characterization by microCT showed mixed osteogenic and osteolytic lesions as described in human disease and no histologic difference was found regardless of the model studied. Immunohistochemical, transcriptomic and TMA comparative studies are still in progress. Zoledronic acid was shown to be an effective therapy to reduce the tumor growth in mice jaw osteosarcoma.
Conclusion: We describe the first animal model of jaw osteosarcoma in non-GM mice and its potential use in specific therapeutic targeting.

Keywords : osteosarcoma, microenvironment, bone resorption, angiogenesis
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Management of Giant Cell Tumours of the Distal Radius, Recurrence rates and Suggested Surgical Treatment

Abstract ID : 1251
Submitted by : Richard Knight the 2016-02-13 19:10:39
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Treatment of giant cell tumours of the distal radius is problematic, with recurrence rates being consistently higher than other sites. What evidence there is relies on small case series, the majority numbering fewer than forty patients. Rates of between 25-89% are quoted for intralesional excisions; although recurrence rates for en bloc resection tend to be lower (0-33%). However, although these techniques provide generally lower recurrence rates, these procedures come at the potential disadvantage of needing to sacrifice the articular surfaces, theoretical decreased function and limited revision options in the case of recurrence. Despite much research, no clear consensus has emerged in how to best treat these tumours and their respective tumour Campanacci grades.

Method

This case series retrospectively looked at all giant cell tumours of the distal radius treated at the Royal Orthopaedic Hospital Bone Tumour Unit between 1988-2013, looking at the treatment each patient received and ultimately their outcome with regards local recurrence and functional status using the Toronto Extremity Salvage Score (TESS). Treatment options included: Simple Curettage, Curettage with supplementary cementation of the cavity, or en bloc excision followed by endoprosthetic replacement or bone grafting and arthrodesis.

Results

Forty-three patients were identified. The mean length of follow up was 164.7 months. The overall recurrence rate was 30.2% with a mean time to recurrence of 31 months. Recurrence rates for Campanacci grade 3 tumours ranged from 67% for curettage alone, to 14.3% following en bloc excision. Functional outcomes varied with TESS from 86.2% with simple curettage alone to 57.4% following curettage with cementation.

Conclusion:

It is clear from the results that overall the use of PMMA cement to supplement curettage reduces recurrence rates in all Campanacci grades treated surgically. This study also shows that there was a reduction in local recurrence rates in Campanacci Grade 3 tumours treated with en bloc resection and reconstruction compared with intralesional curettage and cementing (33% v 14.3%). Of note, in Campanacci grade 3 patients, there is no difference in functional outcomes between those treated with en bloc excision v curettage and cementation (57.9% v 57.4%) Curettage and cementation of a giant cell tumour of the distal radius reduces the risk of recurrence and we would no longer advocate simple curettage of a distal radius lesion. There does appear to be a higher recurrence rate in grade 3 tumours treated with intralesional excision and cement versus en bloc excision with no resultant difference in functional outcomes.

Keywords : Giant Cell Tumour, Radius, Recurrence, Curettage
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Risk Factors for Local Recurrence after Intralesional Curettage for Giant Cell Tumors of Bone

Abstract ID : 1457
Submitted by : Peter Horstmann the 2016-02-22 10:49:29
Category : Others
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Introduction and Objectives
Intralesional treatment of giant cell tumors of bone (GCT) increases local recurrence rates compared with wide resection. However, the functional outcome after curettage is typically superior to wide resection and resection is usually reserved for recurrent disease or intra-articular pathological fractures. Adjuvant treatments such as PMMA have been proposed to reduce local recurrence rates. However, some surgeons believe that other factors are equally important. We aimed to determine if any patient demographics, tumor characteristics, or surgical/clinical parameters could be risk factors for local recurrence after intralesional treatment of GCT.

Materials and Methods
We retrospectively reviewed data from a national cohort of all patients with GCT of the appendicular skeleton (n=74, M/F: 37/37, median age 29 (12-68) years), treated with intralesional curettage between 1998 and 2013. The association of risk factors with local recurrence was analyzed using univariate and multivariate Cox regression and Kaplan-Meier survival analysis. (Risk factors: Age, gender, tumor grade and location, preoperative pathological fracture, histological diagnosis confirmed before final surgery, the use of PMMA, and treatment in (or outside) oncology center)

Results
The cumulative 4-year local recurrence rate was 37%. In the univariate analysis the only significant risk factor associated with local recurrence was “histological diagnosis confirmed before final surgery” (HR=0.45 CI: 0.21–0.98). In the multivariate analysis the only significant independent risk factors associated with local recurrence rate were “histological diagnosis confirmed before final surgery” (HR=0.30, CI: 0.10-0.90) and “treatment at an oncology center” (HR=0.29 CI: 0.08-0.99). There was no independent association between local recurrence rate and other parameters such as age, gender, tumor location and Campanacci grade, pathological fracture or the use of PMMA.

Conclusions
Our results suggest that confirmation of histological diagnosis before final surgery and referral to an orthopedic oncology center are important to avoid local recurrence of GCT. These findings support that surgery for GCT’s should be performed at a dedicated orthopedic oncology center, where biopsy typically is a part of the diagnostic routine. It seems that local adjuvant therapy with PMMA in itself is not a guarantee for a lower recurrence rate.

Keywords : Giant Cell Tumor, Curettage, Risk factors, Local Recurrence
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Complications in Surgical Treatment of Patients with Osseous Metastases of Renal Cell Carcinoma

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Introduction: Osseous metastases are the second most common site of renal cell carcinoma metastases, second only to the lungs. Large, destructive, and hypervascular in nature, these tumors do not respond reliably to conventional chemotherapy and radiation. In comparison of patient outcomes and complications based on method of surgery, history of nephrectomy, and extent of metastases, results vary greatly in previous studies.

Objective: The objective of this study is to report on the outcomes of patients treated for osseous metastasis of renal cell carcinoma and review complications associated with resection with endoprostheses and curettage with osteosynthesis.

Methods: 45 patients (33 men, 11 women) were treated surgically at our institution for osseous metastases of renal cell carcinoma. Mean age was 60.8+11.1 years. Locations of metastases included Humerus (17), Femur (14), Tibia (6), Pelvis (4), Radius (2), and Scapula (2). All patients received pre-operative embolization. Currently, 31 (69%) patients are dead of disease and 14 (31%) patients are alive with disease. Mean follow-up is 20+19.8 months (range, 2-75 months).

Results: Overall, survival was 51% after 1 year, 29% after 2 years, 22% after 3 years, and 11% after 5 years. Patients without visceral metastasis had increased survival time (HR 3.29, 95% CI 1.58 to 6.86; p=0.004). There was no increase in survival among patients who had solitary versus multiple osseous lesions (HR 0.90, 95% CI 0.39 to 2.06; p=0.794), nephrectomy versus without (HR 0.81, 95% CI 0.20 to 3.76; p=0.796) or clear cell subtype of renal cell carcinoma (HR 0.88, 95% CI 0.45 to 1.73; p=0.721). 21 (47%) patients were diagnosed with renal cell carcinoma after detection of osseous metastases. 32 (71%) patients underwent resection with endoprosthetic reconstruction and 13 (29%) underwent curettage with osteosynthesis. Although patients treated with resection had no increase in overall survival (HR 1.275, 95% CI, 0.56 to 3.10; p=0.5427), there was a reduction in local recurrence (OR 0.07, 95% CI, 0.01 to 1.59; p=0.023). In patients with resection of solitary osseous metastases, there was also no increase in survival (HR 1.59, 95% CI, 0.58 to 5.28; p=0.256). While there was no significant difference in complication rate in patients with resection versus curettage (6/32 vs 5/13; p=0.163), there was a difference in the distribution of complications between groups. In the resection group, all complications (6) were related to infection. In the curettage group, complications included local recurrence with mechanical failure (2), mechanical failure alone, infection requiring debridement, and deep infection requiring chronic oral antibiotics.

Conclusion: The goals for surgical treatment should include relief of pain, restoration of functional status, and reduction of local progression of disease. Complications associated with resection/endoprosthesis were infection, while complications associated with curettage/osteosynthesis were mostly failure of fixation associated with recurrence. Although resection/endoprosthesis may be more stable and reduce local disease progression, the risk of infection is higher.

Keywords : Renal Cell Carcinoma, Metastatic Lesions, Complications
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Lymphoma of Bone and Soft Tissues: Diagnostic and Therapeutic Considerations

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Submitted by : Hans Roland Dürr the 2016-02-04 16:00:50
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Introduction
Malignant lymphoma of bone is rare, in advanced stage, it may be difficult to differentiate from osseous involvement in conventional lymphoma. The aim of this work was to show the typical clinical and radiological parameters of this lesion, local therapy and prognosis.

Patients and Methods
Between 1980-2015, 110 patients were treated with lymphoma of bone and/or soft tissue. The average age at diagnosis and surgery of 62 men was 59 years (21-98 years) that of the 48 women 61 years (21-101). Pelvic lesion were seen in 25 cases, spinal in 23, humeral in 15 (prox. 11), femoral in 9, scapular in 5, tibial in 6, fibular in 4, ulnar and radial in 2, at the trunk in 5, one in the foot, disseminated in 3 and soft-tissue lesions in 10 cases.
Regarding surgery an incisional biopsies was done in 41 cases, true-cut biopsies in 31, spinal surgery in 14, conservative therapy only in 12 cases, and otherwise a spectrum of osteosyn-thesis and endoprothetic reconstructions. Main symptom was pain in 75% of the cases, followed by swelling (28%), neurology and frac-ture (16%), swelling of lymph nodes in 10%, restriction of movement in 5%, and B-symptoms in 9% of cases. Average time of symptoms was 9 months (0-198 months), median 3.6 months.

Results
29% of the patients had multiple bone lesions, 67% an extraskeletal involvement. 40 patients died during the observation period. In the surviving patients, the follow-up was 8.5 to 421 months (means 102 months). Overall survival is demonstrated in Fig 1. After 10 years 60% of the patients were still alive. Of the surviving patients 93% were free of disease. Highly signif-icant on survival was the age of the patients. Dissemination (skeletal and visceral) was prog-nostically not significant in the multivariate analysis. In addition to the age, the value of Lac-tatedehydrogenase (LDH) was the most important significant prognostic factor (Fig. 2, $p < 0.05$).

Summary
Lymphoma of bone is a clinically and radiologically often difficult diagnoses. The prognosis is good with an overall survival of 60% after 10 years. Resection of the tumour is not necessary. The age (+/- 60 years) and the increase of LDH were the most important prognostic factors.

Keywords : Lymphoma of bone, prognosis, therapy, diagnosis
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1.jpg, http://sites.altilab.com/files/122/abstracts/figure-2.jpg
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The EMSOS+ Adamantinoma study: a clinical, radiological and histopathological analysis of 192 cases.

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Introduction and Objectives
Adamantinoma of the long bones is a low-grade, slow-growing, primary malignant bone tumour composed of epithelial cells in a fibrous or osteofibrous stroma. Current studies show that adamantinomas appear to be of epithelial nature. Histologically there is heterogeneity in appearance of the epithelial (tumour) cells within this lesion. This has led to the distinction of osteofibrous dysplasia-like adamantinoma (OFD-AD) and classic adamantinoma (AD). In the first lesion cells are often thinly spread throughout and osteofibrous dysplastic stroma while in the latter the tumour consists largely of lesional cells.
Adamantinomas account for 0.3%-1% of malignant bone tumours, which makes this an orphan disease. Pooling of data from multiple specialised bone tumour centres becomes essential for research. This paper is the mid-term update to this EMSOS+ adamantinoma study.

Methods
A global multicenter retrospective database was created in which patient demographics details, clinical and radiological details as well as histological and surgical treatment details were collected. Only centers with experience in treating rare bone tumors were asked to participate. The questionnaire was surgeon completed. Patients were included if > 24 months follow-up (FU), inclusion between 1975-2014. Cox regression was used to assess the risk of several factors for local recurrence in OFD-AD and AD.

Results
192 patients (95OFD-AD) with a minimum FU of 24 months were included in this study. Mean age at presentation for the tumors combined was 24 years (median 18). 47% of patients are male. OFD-AD was diagnosed 16 years earlier than classic AD (16yr vs 32yr). Patients had a mean FU of nearly 9 years (2-32yrs range). 53 patients (28%) experienced local recurrence (LC) (mean) 51months (3-240) after initial diagnosis. Recurrences were spread equally between OFD-AD and classic AD(25 vs 28). 15 patients (15%) experienced metastatic disease and 11(13%) patients suffered fatal disease, all cases were considered classic AD cases.
Multivariate Cox regression (covariates; size>+/- 5cm<, pathological fracture >Y/N<, free resection margins>Y/N<) showed that free microscopic resection margins are significantly protective for the risk of LR(HR0.2 CI95% 0.1-0.4) in both OFD and AD. Pathological fracture increased the risk for LR in AD cases only (HR3.4 CI95% 1.1-10.2). There were no recorded cases of progression of diagnosis from OFD-AD to AD after initial recurrence.

Discussion/Conclusion
Orphan diseases such as adamantinomas require collaborative international studies to advance research. Therefore, we have set up a global EMSOS+ study/partnership with many renowned specialist bone tumor centers globally. OFD-AD tumors behave locally aggressive and may be considered as borderline tumors, while classic adamantinomas can metastasize and result in a fatal outcome. Both tumors have shown a substantial risk for LR and recur at similar rates. In all patients with adamantinomas we advocate wide resection margins and extended FU.

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ANGIOSARCOMA OF BONE: A RETROSPECTIVE STUDY OF THE EUROPEAN MUSCULOSKELETAL ONCOLOGY SOCIETY (EMSOS).

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BACKGROUND: Angiosarcoma of bone (B-AS) is a high-grade malignant tumor of vascular origin. Due to its rarity, few data are available about treatment and outcome of B-AS. An EMSOS retrospective study has been launched in 2015. Aim of the study is to collect data from different European Centers to increase our knowledge on natural history, type of treatment and prognosis of B-AS. The preliminary data of the study are here presented
PATIENTS AND METHODS: The study is open to all members of the Society, synopsis and electronic dataset are available on the EMSOS WEBsite. Data of patients were anonymized and collected according to the national rules for observational studies.
RESULTS: At December 2015 data of 40 patients (27 male and 13 female, median age 60 years, range 23 to 82) enrolled in 4 Centers were sent to the Study Secretariat. Femur, pelvis and spine were the most frequent sites of disease. Synchronous metastases were reported in 47% of the patients, of them 52% had multiple sites of metastatic disease. Surgery of primary tumor was performed in 35 (88%) patients (Resection 54%, Amputation 32%, intralesional surgery 14%). Overall a Surgical complete remission status (SCR) was achieved in 20 (50%) patients.
Five-year overall survival (OS) was 26% (42% for patients without and 12% for patients with synchronous metastases). In case of SCR, the 5-year OS was 39% and 13% in those patients who did not (median time to death TOT months). In SCR-patients treated with chemotherapy the 5-year OS was 54% (31% without chemotherapy). In metastatic patients the median mean survival time was 11.7±23 months with chemotherapy and 3.1±5 without chemotherapy). Different chemotherapy regimens were used (Osteosarcoma-like, Gemcitabine, Paclitaxel). Partial response or prolonged disease stabilization were reported only after Gemcitabine or Paclitaxel use.
CONCLUSIONS: Complete surgical resection is a key factor for survival of patients with angiosarcoma of bone. Metastatic B-AS is a fatal disease, but prolonged survival can be achieved with Gemcitabine or Paclitaxel regimens. The study is continuing the enrollment and the participation of the EMSOS members is welcome

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Keywords :
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Pigmented villonodular synovitis of the knee: a large retrospective analysis of 214 cases at a UK tertiary referral centre

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Submitted by : Kavi Patel the 2016-01-20 11:05:49
Category : Others
Typology : Communication orale / Oral communication
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Introduction: Pigmented villonodular synovitis (PVNS) is a rare, locally aggressive and potentially recurrent disease of the synovium. The Royal National Orthopaedic Hospital runs a tertiary referral service for bone and soft tissue tumours and we present the largest single-centre experience of knee PVNS in the literature. Our aim was to evaluate our centre's experience in the management of knee PVNS.
Methods: Retrospective data collection of consecutive cases of knee PVNS from 2002-2015.
Results: 214 cases of knee PVNS were identified, with histological diagnosis, which represented 53.4% of all PVNS at our centre. 100 were localised PVNS (LPVNS), 114 diffuse PVNS (DPVNS) and 2 malignant villonodular synovitis, a rare entity. 188 were primary cases and 26 had already been treated at another institution. Knee PVNS was more likely to occur in females with a mean age of 39. The most common location of LPVNS was Hoffa's pad. Following surgery, 47.6% had recurrence with DPVNS as opposed to 8.6% with LPVNS. In LPVNS, there was no significant difference in recurrence between open and arthroscopic synovectomy (8.7% vs 9.1%, $P > 0.05$). However, in DPVNS, there was a statistically significant higher risk of recurrence with arthroscopic compared to open synovectomy (83.3% vs 45.2%, $P = 0.027$). Sixteen patients went on to have TKR. The surgical complication rate was 9.7% and 62% were noted to be pain free with full range of motion at follow-up.
Conclusion: PVNS is a rare, aggressive soft tissue tumour that affects the knee in more than half of cases. It can be difficult to treat. We found no difference in local recurrence rates between open and arthroscopic treatment of LPVNS but significantly increased rates of recurrence for DPVNS following arthroscopic treatment. We would therefore recommend open synovectomy for DPVNS.

Keywords : Pigmented villonodular synovitis, Tenosynovial giant cell tumour, Knee, Synovectomy
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Preliminary results on the international multicenter retrospective Tenosynovial Giant Cell Tumour Database

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Introduction
Tenosynovial Giant Cell Tumour(TGCT), previously named Pigmented Villonodular Synovitis(PVNS), is a rare, locally aggressive neoplasm. The lesion can either present as a single nodule(nodular-type), or as multiple nodules(diffuse-type) along a synovial layer or tendon sheath. Current literature primarily consists of several relatively small cohort studies containing generally inhomogeneous data. A multicenter-pooled database of individual patient data is therefore essential in order to evaluate current treatment protocols and their clinical results, as well as risk factors for progressive disease and local recurrence. Our goal is to set up a retrospective multicenter cohort with histologically proven TGCT, treated between 1990 and 2014 with a minimum follow-up of two years.

Methods
(Un)published data of individual patients from five tertiary orthopedic oncology centers are the base of this international multicenter database. 407 (239 female, median age at operation 34.7years) cases with TGCT are included: 190 of 276 affected knee-joints are diffuse-type, 86% of these primarily treated with open-resection; 86 nodular-type, 85% primarily treated with arthroscopic-resection. 131 other joints are affected of which 84(64%) are diffuse-type. TGCT of fingers and toes are excluded.
The median follow-up time overall is 6.39(95%CI 5.19-7.59) years.
To assess the effect of risk factors on first recurrence, a multivariate cox-regression model with risk factors: gender(male/female), age at first operation(years), surgical treatment(arthroscopic/open), affected joint(knee/other) and TGCT-type(diffuse/nodular) is estimated. The results are reported as hazard ratios(HR) and their corresponding 95% confidence intervals(95%CI). Local recurrence free survival at 2-and 5-years is calculated from the time of first surgical resection to first recurrence.

Results
Total number of first recurrence is 157(39%); located about the knee, diffuse-type 103(54%) and nodular-type 13(15%); other affected joints, diffuse-type 30(35%) and nodular 7(15%). Mean time to local recurrence is 11.68(95%CI 9.57-13.80)years.
The HR for gender(0=male), age at operation, surgical treatment(0=open-resection), joint(0=knee) and TGCT-type(0=diffuse) is 1.43(95%CI 1.04-1.96), 0.99(95%CI 0.98-1.00), 1.07(95%CI 0.83-1.37), 1.39(95%CI 0.96-2.00) and 2.40(95%CI 1.64-3.52) respectively. Recurrences occurred significantly more frequent in male patients (p=0.018) and in diffuse-type(p=0.0001).
The median time to recurrence; in male is 5.16 (95%CI 3.10-7.20) years and in female 16.05(95%CI 4.82-27.36) years (p=0.017); after arthroscopy 5.00(95%CI 2.36-7.64) years and after open-resection 10.56(95%CI 7.52-13.53) years (p=0.089).
Local recurrence free survival at 2-and 5-years is 0.74(95%CI 0.69-0.80) and 0.59(95%CI 0.54-0.65) respectively. At final follow-up 343 patients(84%) show no evidence of disease (49 alive with disease, 5 death of other disease, 10 lost).

Conclusion
Preliminary results on the international multicenter TGCT database show a high risk of first local recurrence, especially with diffuse-type. Nodular-types recur less, but still remarkably often. Interestingly recurrences are diagnosed significant earlier in men. To prolong time to recurrence, open resection is advocated, especially in young patients with TGCT about the knee and in diffuse or recurrent cases.
Further investigation of risk factors for recurrence of TGCT is essential for proper treatment planning in an era of new systemic and (neo)adjuvant treatment possibilities. In order to get more reliable information about this orphan disease and expose possible risk factors for local recurrence, multidisciplinary but foremost international multicenter collaboration is of utmost importance.

Keywords : Tenosynovial Giant Cell Tumour(TGCT), Pigmented Villonodular Synovitis(PVNS),
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An osseointegrated percutaneous prosthetic system for treatment of transfemoral amputees: Medium and projected long-term follow up

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Submitted by : Örjan Berlin the 2016-02-09 20:20:14
Category : Others
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction: In 2014 we published the first prospective study (Bone Joint J 2014;96-B:106-113) on the results of bone-anchored amputation prostheses in transfemoral amputees (TFA). The OPRA study (Osseointegrated Prosthesis for the Rehabilitation of Amputees) includes 51 patients with 55 implants recruited from 1999 to 2007. At the 2-years follow-up (FU) in May 2010, 3 patients were excluded (1 dead, 1 lost to FU, 1 withdrawn due to contralateral extremity problems). The aim of the current study is to report on the clinical outcome with a minimum of 5-years FU with this technique, and projected 10 year results.
Methods: The surgery consists of a two-stage procedure. First a titanium screw (fixture - F) is inserted intramedullary into the remaining skeleton (S1 operation). Six months later a transdermal implant (abutment - A) is inserted into the fixture (S2 operation). The abutment is secured to the fixture by an abutment screw (AS).
Results:
At 2-years FU four implants had been removed due to loosening (3) or infection (1), leaving 44 remaining patients (48 implants) in the study. The cumulative implant survival was 92 %. The patients had an average of one superficial infection every two years, successfully treated conservatively with peroral or local antibiotics in all cases. There were 6 deep infections in 4 patients. All but one were successfully treated by conservative means. Four patients had 9 mechanical complications (bent or fractured As or ASs) and 3 skeletal fractures occurred. Prosthetic use, prosthetic functions and global quality of life were all significantly improved ($p<0.001$).
At 5-years FU no additional fixture losses were reported, but another patient had passed away unrelated to the procedure (43 patients/47 implants). Hence the implant survival rate remains stable at 92%. Between the 2- and 5-year FU superficial and deep infections occurred in 22 and 7 patients respectively. Another 8 patients had bent or fractured A or AS after trauma, and 15 patients had other mechanical problems due to wear leading to change of the A or AS. No F has been removed between the 2- and 5-year FU.
Beyond 5-year FU one F was revised due to mechanical complication. Two additional F have been extracted between 7- and 10- year FU leaving 40 patients of which 16 have been followed for 10 years or more. The projected 10-year implant survival is 84 %.
Conclusion: The observed cumulative success rate of 92% at 2-years FU remains stable at 5-years FU. The OPRA technique continues to be promising with a projected 10-year success rate of 84 %. Despite the general belief in the orthopaedic community deep infection does not necessarily correspond to loosening of the implant. Patients using the OPRA implant report stable improvements in prosthetic function at 2- and 5-years FU as compared to baseline, and preliminary results indicate that this improvement is stable until 10-years FU. However the mechanical issues are of concern in a long-term perspective and need to be continuously monitored. So far these issues have been successfully addressed and solved.

Keywords : amputation, osseointegration, rehabilitation
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Management of foot and ankle malignancies: is it worth salvaging?

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Submitted by : BUGRA ALPAN the 2016-02-22 23:29:34
Category : Others
Typology : Communication orale / Oral communication
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Introduction

Surgeons are conventionally more inclined to offer amputation for malignant tumors of the foot and ankle when compared to other parts of the lower extremities. This preference may be explained by the difficulty in obtaining safe margins while preserving adequate vitality and functionality of the remaining tissues.

Patients and Methods

We retrospectively reviewed 54 (M/F: 34/20) patients who underwent surgical treatment for primary malignant tumors of foot and ankle between 1992-2015. The mean age of the patients was 35,4 (3-82) years. Seven patients with insufficient data were excluded from analysis. Of the remaining 47 (M/F:29/18) patients, 21 (44,7%) patients presented with either inappropriate biopsies or unplanned resections in elsewhere hospitals. Forefoot and hindfoot were the most common locations with 11 patients each. Synovial sarcoma was the most common pathology with 17 patients while Ewing's sarcoma, which was observed in 8 cases, was the second most common. The stage was determined as IIB in 38 (80,1%) and osseous involvement was noticed in 30 (63,8) patients. The mean tumor volume was 58,5 (2-286) cm3. Neoadjuvant chemotherapy was administered to 17 patients and neoadjuvant radiotherapy to 29 patients. Limb salvage surgery was performed as index surgery in 42 (89,4%) patients at presentation to our institution. Amputation was performed for the remaining 5 cases. Free myocutaneous, osteomyofasciocutaneous and osseous flaps from various anatomical donor sites were used in 13 (27,7%) patients for bone and soft tissue reconstruction. Cryopreserved resected bone specimens or structural iliac autografts were used in 6 patients. The patients were followed-up for a mean period of 32,7 (3-115) months.

Results:

Wide margins were achieved in 38 (80,9%) patients. Disease recurred locally in 7 (14,9%) patients. All local recurrences were observed in the limb salvage group. Subsequent amputation had to be performed in 3 patients due to local recurrence and in 1 patient due to regional metastasis. Distant metastases were observed for a total of 16 patients of whom 3 were already metastatic at the time of presentation to our institution. The oncological outcome measures were calculated as follows: 5-year overall survival 83,8%, recurrence-free survival as 69,6%, metastasis-free survival as 60% and event-free survival as 44,1%. Mild deformities, which did not prevent plantigrade walking, were seen in 16 patients and were the most common complications while wound problems were observed in 13 patients. Neoadjuvant radiotherapy use and wound problems were found to be significantly correlated (p:0.008). The mean AOFAS score for those patients with successful limb salvage at the time of last follow-up was 77,2 (41-100). Statistical analysis revealed a significant inverse correlation between AOFAS scores and osteoarticular tumor involvement and tumor volume in the foot and ankle region ($p<0.001$).

Conclusions:

The results of this study suggest that successful limb salvage with acceptable oncological outcomes is possible in most cases of foot and ankle malignancies when adjuvant methods and special reconstruction techniques are applied with knowledge, experience, skill and creativity.

Keywords : foot, ankle, sarcoma, limb salvage, amputation
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Treatment of Osteoid Osteomas of the Foot: A Review of 100 Cases

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Typology : Communication orale / Oral communication
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Introduction. Osteoid osteoma (OO) is a small, benign, osteogenic bone tumor, with less than 11% of cases located in the feet. Although the foot is a relatively infrequent site for osteoid osteoma, it is the most prevalent benign bone tumor affecting the foot. OO accounts for about 20% of all benign bone tumors in the foot and ankle, with a particular predilection for the talus and the calcaneus. We review our experience in OO of the foot bones in order to 1) evaluate the prevalence and site of OO in the foot in a tertiary orthopedic oncologic referral center 2) analyze the incidence of local recurrence considering the type of treatment (surgical excision, excisional CT-guided biopsy, or radiofrequency ablation).
Material and Methods. The medical records of 100 cases of osteoid osteoma of the foot treated between 1975 and 2009 were reviewed retrospectively. There were 73 male and 27 female patients, with a mean age of 23.4 years (7-61 years). The lesions were located in the talus (n=59), calcaneus (n=14), metatarsal bones (n=9), cuneiform bones (n=5), phalanges (n=4), cuboid (n=4), navicular (n=2) and tarsal bones, not otherwise specified (n=3). None of the patients had received prior percutaneous or surgical treatment for the tumor. Twelve tumors were intra-articular and 88 extra-articular. All patients were taking routine analgesics including anti-inflammatory medications.
Results. Treatment consisted of radiofrequency ablation (RFA) in 43 patients, excisional CT-guided trocar biopsy, or percutaneous drill resection (PDR) in 21 patients, intralesional curettage in 43 patients, and wide resection alone as well as wide resection with total ankle arthroplasty in one patient each. Indications for different strategies of treatment changed during the time period studied in favour of RFA. Adequate follow-up was available for all patients. All patients experienced post-procedural pain reduction. One patient treated with RFA reported recurrent pain after 2 months and was successfully treated with a second RFA. The overall recurrence rate was 1%; however, it was 2.3% in those patients treated with RFA. No adverse events related to treatment or to the anatomical location were recorded.
Conclusion. RFA is a safe and effective alternative to surgical resection of osteoid osteomas of the foot. Caution should be taken when performing this procedure on lesions less than 1 cm from neurovascular structures or in superficial locations, due to risk for soft tissue injury from thermal necrosis.

Keywords : Osteoid Osteoma; Foot; Tumor
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Clinical experience from a 10-patient cohort implanted with a new prophylactic device to prevent impeding pathological hip fractures

Abstract ID : 1783
Submitted by : François Cornelis the 2016-04-12 16:47:56
Category : Others
Typology : Communication orale / Oral communication
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Introduction: A percutaneous internal fixation device (Y-STRUT®, Hyprevention) has been developed to prevent hip fracture in case of osteolytic metastases located in the femoral neck. The tolerance of Y-STRUT® and the related operative procedure has been prospectively evaluated in a multicentre pilot study.
Method: A total of 12 cancer patients have been considered for prophylactic consolidation, performed percutaneously under fluoroscopic guidance using a dedicated internal fixation device. All patients presented a high risk of hip fracture (Mirels' score ≥8). Patients were followed by medical consultation and radiographic exams.
Results: Two cancer patients suffered from a fracture that occurred prior to the prophylactic consolidation and were excluded from the study analysis. Ten patients (40% female, mean 61±6yo) were treated for impending pathological fractures. All the procedures were performed with success. Average hospitalization was short with 2.3 ± 1.4 days. Four of the 10 patients (40%) were discharged the day following the intervention, suggesting that the implantation could be performed as an ambulatory procedure. Wound healing was achieved in all cases with no access site complication. Mean pain decreases from 3.6±2.9 at baseline to 2.4±0.9 at 2 months. During the follow-up, 6 patients (60%) deceased from severe progression of their underlying cancer after a mean follow-up of 142 days (range 24 to 324 days). All survival patients have reached one-year follow-up.
Conclusion: Preliminary results demonstrate the feasibility and the safety of the implantation as well as the tolerance of the device.

Keywords :
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-emsos-2016-clinical-experience-from-a-10-patient-cohort-impla....docx, http://sites.altilab.com/
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P16 EXPRESSION AS A PROGNOSTIC AND PREDICTIVE PARAMETER IN PATIENTS WITH HIGH GRADE OSTEOSARCOMA OF BONE: AN ANALYSIS OF 357 CASES

Abstract ID : 1207
Submitted by : Marco Gambarotti the 2016-02-11 16:11:40
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

BACKGROUND: P16 is a cyclin-dependent kinase inhibitor encoded by the CDKN2A gene and is considered one of the major tumor suppressor acting through blocking of CDK-4 signaling and consequently, cell cycle progression. The potential prognostic and predictive value of p16 in high grade osteosarcoma of bone has been recently investigated in small series of cases and the results from different studies were somewhat controversial.
METHODS: A retrospective immunohistochemical analysis of p16 expression was performed in a series of 357 patients, included in different neoadjuvant chemotherapy protocols from 1986 to 2010, to explore its potential prognostic and predictive value. The eligibility criteria were: diagnosis of central high-grade osteosarcoma of the extremity, age younger than 40 years, absence of metastases at the time of diagnosis, and no prior chemotherapy or surgical treatment for bone lesions. Immunohistochemistry was performed with a commercially available p16 monoclonal mouse antibody. Follow-up data were available in all cases with a median of 120 months (range: 6-366 months).
RESULTS: Positivity for p16 was detected in 70.6% (252/357) of cases. The p16 expression did not differ by age, gender, tumor site, histologic subtype, tumor volume, surgical margin, serum alkaline phosphatase levels, LDH levels. In the different chemotherapy protocols included the incidence of p16 expression was similar. On univariate analysis, a significant association was noted between p16 expression and pathologic complete response to chemotherapy with the presence of p16 in 80.3% (175/218) of cases with a good pathologic response after chemotherapy and in 55.4% (77/139) of cases with a poor pathologic response ($p< 0.001$). The absence of p16 expression was significantly associated with an adverse metastases free survival (MFS) (5% years MFS: 74.4% p16 negative cases versus 66.4% p16 positive cases, $p=0.012$), disease free survival (DFS) (5% years of DFS: 73.2% p16 negative cases versus 62.9% p16 positive cases, $p=0.04$) and overall survival (OS)(5% years of OS: 75.3% p16 negative cases versus 64.1% p16 positive cases, $p=0.05$) when compared with the presence of p16 expression.
Multivariate Cox regression analysis did not show p16 expression to be an independent prognostic factor (hazard ratio (HR)= 1.422 for MFS, $p=0.052$; HR= 1.288 for DFS, $p=0.181$; HR= 1.322 for OS, $p=0.179$).
Pathologic response to chemotherapy (HR= 1.933 for MFS, $p<0.001$; HR= 2.145 for DFS, $p<0.001$; HR= 2.395 for OS, $p<0.001$) and LDH levels (HR= 1.409 for MFS, $p=0.045$; HR= 1.493 for DFS, $p=0.039$; HR= 1.667 for OS, $p=0.025$) were independent factors influencing the survival.
CONCLUSIONS: Data from the current study indicate that the immunohistochemical expression of P16 significantly correlates with chemotherapy response and its absence of expression is associated with a worse prognosis in patients with high grade osteosarcoma of bone although it does not represent an independent marker of clinical evolution.

Keywords : OSTEOSARCOMA, p16
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The two faces of TRAIL-based therapies in pediatric bone tumors: how to counteract the activation of pro-proliferative pathways?

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Submitted by : Françoise Redini the 2016-02-12 16:09:20
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Introduction: Osteosarcoma (OS) and Ewing sarcoma (EWS) are the two most common pediatric bone tumors arising mostly in young people. No major therapeutic advances have been reported for the last three decades with a 5 year-survival rate of 70% for localized tumors and only around 20 % for metastatic forms or patients resistant to chemotherapy. The pro-apoptotic cytokine TNF-Related Apoptosis Inducing Ligand (TRAIL) that selectively kills tumor cells represents a promising therapeutic approach for patients at high risk. However, multiple resistance phenomena were observed when studying TRAIL sensitivity in several OS and EWS cell lines. Among these resistance mechanisms, the activation of TRAIL-induced surviving, migration and invasion pathways, (NF-kB, MAPK, PI3K/Akt…) involving the same death receptors (DR4 and DR5) as those implicated in apoptosis, is our major concern.
Materials and methods: We used two different TRAIL death receptor agonists to induce TRAIL apoptotic and non-apoptotic pathways in in vitro and in vivo models of OS or EWS: a conventional antibody agonist to DR5 (AMG655 - Amgen) and a TRAIL-receptor multiple agonist able to bind six receptors per molecule (APG880 - AbbVie).
Results: We show that AMG655 treatment allows the slowing down of tumor growth in an in vivo model of EWS, induced in Nude mice by xenograft of human EWS cells initially sensitive to TRAIL. However, the same treatment accelerates tumor growth in an OS in vivo model, induced by xenograft of cells initially resistant to TRAIL. We demonstrate by shRNA technique that the key scaffolding protein RIPK1 is required for the induction of the non-apoptotic pathway leading to increased tumor proliferation. Indeed, the downregulation of RIPK1 in OS in vivo model not only block the induction of pro-proliferative pathways after AMG655 treatment, but also sensitizes the OS cells to the induction of the pro-apoptotic pathway. Then, we hypothesize that increasing the clustering of TRAIL receptors could promote pro-apoptotic pathway instead of pro-proliferative pathway. The TRAIL receptor multiple agonist APG880 allows us to confirm this hypothesis as APG880 treatment slows, or even stops, tumor development of an OS in vivo model initially resistant to TRAIL.
Conclusion: In this study, we investigate the two paradoxical pro and anti-tumoral effects of TRAIL in pediatric bone tumors to better understand the activation modalities of different signaling pathways. Our results suggest two sensitization tracks: 1-Targeting the scaffold protein RIPK1 required for activation of pro-proliferative pathways; 2-The use of compounds allowing TRAIL-receptor high-clustering to promote apoptosis instead of pro-tumoral effects.

Keywords : ewing sarcoma, osteosarcoma, TRAIL, resistance
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Preoperative plasma YKL-40 levels in bone and soft tissue sarcoma patients

Abstract ID : 1472
Submitted by : Andrea Thorn the 2016-02-22 16:42:58
Category : Others
Typology : Communication orale / Oral communication
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Introduction:
YKL-40 is a glycoprotein that has showed expression in several types of cells such as cancer cells, macrophages and leukocytes, embryonic cells, fetal cells, and cartilage cells. Previous studies have shown that elevated plasma concentrations of YKL-40 in patients with various types of cancer constitute an independent prognostic variable for both a short local recurrence-free interval and a short overall survival. The aim of this study was to identify if YKL-40 in plasma can serve as a marker for prediction of the outcomes in patients with bone and soft tissue sarcomas.

Methods:
Sixty-seven patients (mean age 61 (29-90) years, F/M= 34/33) with bone sarcoma (BS) or soft tissue sarcoma (STS) (BS/STS=15/52) of the extremities, spine or trunk wall treated by surgical excision at the Department of Orthopaedics, Rigshospitalet, Denmark during the time-period August 2009 until April 2012 were included in the study.
All patients had a blood sample taken at the day of surgery or the day before surgery. The samples were analysed using ELISA in order to determine the amount of YKL-40 in plasma. Patient files were reviewed for various information, and patient overall survival was updated January 2016 (minimum follow up of 3.75 years for patients still alive) from the Danish Civil Registration System. Statistics: Kaplan Meier survival analysis with Logrank test, Mann-Whitney test, and Kruskal-Wallis test. P-values < 0.05 are considered significant. Results are given as mean with total range and since YKL-40 is slightly influenced by age, the adjusted YKL-40 percentiles were calculated.

Results:
During the follow-up period 13 patients had a local recurrence of the tumor, and 21 developed metastases. The probability of 5-year survival for all sarcoma patients (n=67) was 64%, and the mean plasma concentration of YKL-40 was 147 g/L (18-576 g/L).
Patients with a YKL-40 concentration below the mean (n=52, 5-year survival 76%) had a better survival (p=0.001) than patients with YKL-40 concentration above the mean (n=15, 5-year survival 15%). Patients with an age adjusted plasma YKL-40 value <95 percentile (n=55, 5-years survival 73%) had a better survival (p=0.003) than patients with a value ≥95 percentile (n=12, 5-years survival 17%).
YKL-40 concentration for patients that were still alive at the end of follow-up was lower than patients who died during the follow up (p=0.02). There was a tendency to higher YKL-40 concentration in patients that had local recurrence (p=0.09) and higher malignancy grades (p=0.11).
We found no relation between tumor size (≤ 8cm or >8cm, p=0.26), sarcoma type (STS or BS, p=0.32), or development of metastases (p=0.64) and the preoperative YKL-40 concentration.
Conclusions:
A high YKL-40 plasma concentration measured preoperatively in sarcoma patients are connected to a poor overall survival.

Keywords : YKL-40, prognosis, survival, sarcoma
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IN VIVO QUANTITATIVE IMAGING OF LUNG METASTATIC GROWTH IN A MOUSE MODEL OF OSTEOSARCOMA

Abstract ID : 1373
Submitted by : Sander Botter the 2016-02-18 13:27:44
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Survival of patients with localized forms of osteosarcoma (OS) is generally above 60%. However, prognosis quickly worsens in case of metastases, which often reside in the lungs. In order to better estimate the effect of therapy, in patients with standard therapy as well as in clinical trials, it is important to collect more quantitative data on lung metastatic growth. In this study, we analyzed lung metastatic growth in vivo in an orthotopic, human xenograft mouse model of osteosarcoma that accurately reflects the human disease phenotype, using a combination of micro-computed tomographic (micro-CT) and bioluminescent imaging (BLI).

Methods

Female SCID mice were intratibially injected with luciferase/lacZ gene transduced 143B human OS cells. Lungs of mice were imaged weekly in an IVIS Lumina XR, after intravenous injection of luciferin, and once every two weeks in the Skyscan 1176 in vivo microtomography system at 35 µm voxel size. After 5 weeks, lungs were excised, Xgal-stained for lacZ expression, and photographed to analyze the amount of superficial Xgal staining as percentage of the total lung surface (%superficial Xgal staining). Next, lungs were embedded into paraffin and sectioned. Between 5-10 sections per mouse, with 400 µm space between neighboring sections, were analyzed for lung metastases using ImageJ. The percentage lung metastatic tissue derived from paraffin-embedded slides (%histology) and the %superficial Xgal staining were then compared to the percentage lung metastatic tissue as quantified from the 3D micro-CT scans, quantified using AnalyzeDirect 12.0, and the BLI signal, quantified using Living Image 4.4.

Results

Classical in vitro proliferation and migration assays showed no differences between the 143B luciferase/lacZ gene transduced cells and cells transduced with a control empty vector. Using BLI, lung metastases were detected 10 days after intratibial injection of 143B luciferase/lacZ cells. After 5 weeks, total lung metastatic volume found with micro-CT scans was on average 14% +/- 6% (mean +/- SEM), and correlated with the values found for %histology (14.5 +/- 3.5%) and %superficial Xgal staining (16.6 +/- 4.2%). The lung metastatic volume quantified by micro-CT measurements correlated equally well with BLI (r2=0.77, p=0.0089). Finally, significant correlations were found between %superficial Xgal staining and %histology (r2=0.58, p=0.04), indicating that superficial Xgal staining is a good representation of total lung metastatic load.

Conclusion

Quantitative imaging of total lung metastatic load in living mice allows us to precisely monitor in vivo growth dynamics of lung metastases. This technique can be applied to quantify treatment effects during ongoing therapy, and consequently enables us to identify treatments that most potently inhibit lung metastatic progression. The techniques used (CT) show that this principle can also be readily applied within the clinics.

Keywords : osteosarcoma, xenograft mouse model, imaging, metastasis
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Difficulties of pulmonary metastasectomy resections in pediatric patients.

Abstract ID : 1420
Submitted by : Iwona Malesza the 2016-02-21 20:38:01
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Difficulties of pulmonary metastasectomy resections in pediatric patients.
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Introduction:
Complete resection of metastatic disease can prolong life in pediatric patients with osteosarcoma.
An aggressive surgical treatment is recommended in which all metastatic disease is resected.
Materials:
We retrospectively reviewed the medical records of 71 children who were operated on in the Department of Surgical Oncology for Children and Youth between January 2000 and December 2014. Seventy one children (42 boys; 29 girls; median age 16 years, range 6-23 years) who underwent pulmonary metastasectomy resection were included in the study.
Results:
A total of 117 thoracotomies were performed.
In 32%(37) of them the resected lesions were benign in histopathological examination
65% of the resected malignant lesions were 5 mm and less in size.
What we found in lesions that weren't malignant: fibrosis, inflamatory lesions, vascular changes, atelectasis, empysema, calcifications, thrombouses, reactive nodes;
Conclusion:
Chest CT cannot be reliable in distinguishing between benign and malignant pulmonary nodules, especially 5mm and less in size.
The inconsistency beteween CT scans and pathologic review needs new solutions to minimize unnecessary thoracotomy in pediatric patients with osteosarcoma.

Keywords : pulmonary metastasectomy, osteosarcoma, children
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EARLY PREDICTION OF LUNG METASTASES IN SOFT-TISSUE SARCOMAS OF THE EXTREMITIES USING JOINT FDG-PET AND MRI TEXTURAL FEATURES

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Submitted by : Krista Goulding the 2016-02-22 03:51:54
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: The specific and early evaluation of lung metastasis risk in the course of soft tissue sarcoma (STS) management is of great interest since it could potentially allow for better adapted treatments and consequently, improve overall survival.We hypothesize that intratumoral heterogeneity could be quantified using texture analysis of FDG-PET and MR images in order to assess tumour aggressiveness at the time of diagnosis. Towards this goal, this study first aims at developing a joint FDG-PET/MRI texture-based model for the evaluation of lung metastasis risk in soft-tissue sarcomas using retrospective analysis. We then assess the model performance using a new prospective STS cohort.

Methods: In this study, a total of 66 patients with histologically confirmed STSs of the extremities of different sub-types were divided into two groups: a retrospective cohort of 51 patients (19 patients developed lung metastases) with a median follow-up of 25 months (range: 4-70) used for training the model, and a prospective cohort of 15 patients (two patients developed lung metastases and one patient, bone metastases with suspicious lung nodules) with a median follow-up of 12 months (range: 4-19) for testing the model. All patients underwent pre-treatment FDG-PET and MRI scans that comprised T1-weighted and T2-weighted fat-suppression sequences. In the training phase, 41 different texture features (e.g., homogeneity, coarseness, etc.) were extracted from the tumor region of the FDG-PET and MRI scans. Multivariable models were constructed using logistic regression and were evaluated using the area under the receiver operating characteristic curve (AUC) in bootstrap resampling experiments. In the testing phase, the best model obtained from the training phase was applied to predict the distant metastasis development status of the prospective cohort.

Results: In the training phase, the best performance was found using a multivariable model with 4 texture features characterizing tumor sub-region size and intensity heterogeneities in FDG-PET and MRI scans. This model reached an average AUC of 0.984 ± 0.002 in 1000 bootstrap resampling experiments. In the testing phase (fig. 3), this model correctly predicted future distant metastasis development for 13 of the 15 patients, with a sensitivity of 1 and a specificity of 0.83.

Conclusion: Our results demonstrate that combinations of FDG-PET and MRI texture features could be successfully used to assess metastasis developement risk at the moment of diagnosis of an extremity STS. The predictive properties of the model now need to be validated using a prospective multicenter study. Ultimately, accurate risk assessment could impact selection of treatment modalities and allow for better personalized treatments.

Keywords : Lung metastasis; predictive tool; FDG-PET/MRI texture-based model; soft-tissue sarcoma
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EGFR inhibitors Identified as a Potential Treatment for Chordoma in a Focused Compound Screen

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Soumis par : Susanne Scheipl Le 2016-02-15 18:26:47
Nom de la catégorie : Targeted Therapy
Typologie : Communication orale / Oral communication
Statut : validé
Autorisation de diffusion : Yes/Oui

Introduction: Chordoma is a rare malignant bone tumour which mainly arises in the axial skeleton. It has a poor prognosis due to a high local recurrence rate: therapeutic options are limited, particularly in large, and recurrent tumours. In view of the unmet need for effective treatment of patients with chordoma, we undertook a large scale compound screen with the aim of identifying therapeutic targets, and understanding the mechanism by which this disease develops.
Materials and Methods: In a focused compound screen we tested 1097 compounds, comprising 2 libraries (PKIS and PKIS2) with a total of 886 small molecule kinase inhibitors provided by GlaxoSmithKline (GSK), 160 Calbiochem (Merck KGaA) kinase inhibitors, an Anticancer Library (n=43) (Selleckchem), and 8 compounds reported to be inhibitors of Aldo-Keto Reductase Family 1 Member B10 (AKR1B10) (Selleckchem). We screened 3 well-characterised chordoma cell lines at a single concentration (1 μM). Based on the spread of data, a hit selection threshold of 2X SD (PKIS) and 1.5X SD (other libraries) was applied for each cell line. Half-maximal effective concentrations (EC50) of the inhibitory hits were determined in chordoma cells and normal fibroblasts in order to select compounds which selectively killed chordoma cells but not fibroblasts. Cell death analysis was conducted. We then included 6 compounds, either clinically approved or in clinical trial, to validate the key target class. Validation experiments were conducted in an extended panel of 7 chordoma cell lines and included Western Blot analysis, ELISA, FISH, and cancer gene hotspot mutation analysis. The most promising compound was tested at South Texas Accelerated Research Therapeutics (START) in 2 xenograft mouse models (U-CH1 xenograft and the patient-derived model SF8894).
Results: 154 compounds were selected from the single concentration screen. Twenty-seven of these 154 compounds selectively killed chordoma cells but not dermal fibroblasts. Twenty-one of 27 (78%) chordoma selective hits were EGFR/ERBB family inhibitors. When EGFR inhibitors in clinical development were studied on an extended panel of 7 chordoma cell lines, 4/7 cell lines were sensitive to EGFR inhibition. Sapitinib (AstraZeneca) emerged as our most promising compound, followed by Gefitinib (AstraZeneca) and Erlotinib (Roche/Genentech). The compounds induced apoptosis and suppressed phospho-EGFR and its downstream-pathways in a dose-dependent manner in the sensitive cell lines. Sapitinib significantly reduced chordoma growth in vivo. Chemical substituent trend analysis suggested that EGFR-inhibitors with small aniline substituents in the 4- position of the quinazoline ring were more effective than inhibitors with large substituents in that position, as for instance Lapatinib (GSK). One of the resistant cell lines (U-CH2) expressed high levels of phospho-MET, a known bypass signalling pathway to EGFR. Neither amplification in EGFR, ERBB2, and MET, nor mutations in cancer gene hotspots were detected in any of the cell lines.
Conclusion: Our findings are in line with reported (p-) EGFR expression in the vast majority of clinical chordoma samples. They provide an evidence base for pursuing a randomised clinical trial using EGFR inhibitors, and for further exploration of possible mechanisms of primary and acquired resistance to these compounds.

Mots clefs : chordoma, drug screen, EGFR, ERBB family, resistance
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Arsenic trioxide as treatment option for pediatric small round blue cell tumors

Abstract ID : 1199
Submitted by : Frank Traub the 2016-02-11 07:58:19
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: The small round blue cell tumors of childhood, which include rhabdo-myosarcoma (RMS) and Ewing sarcoma (ES), are so called because of their similar appearance in routine histology. Although, tumors of both groups differ in their source, predicted cells of origin and the occurrence of specific gene fusions, they share an aberrant activation of the Hedgehog (Hh) pathway. The activation of the Hh pathway has been implicated in the development of cancers and additionally in chemo-resistance and dissemination. Actually, there is an urgent need for new therapeutic options suitable for treatment of drug-resistant, recurrent and metastatic RMS and ES. In this context, the Hh pathway seems to be an attractive target for therapeutic intervention. The glioma-associated oncogene (GLI) transcription factors are downstream mediators of Hh pathway, which can be targeted by arsenic trioxide (ATO). The aim of this study was to determine the effect of ATO on RMS and ES cells.

Materials & Methods: Experiments were performed with different RMS and ES cell lines, and primary skeletal muscle cells (SKMC) as well as mesenchymal stem cells (MSC) as control. To investigate the effects of ATO on cell viability (MTS assay), proliferation (colony formation, 3D spheroid assay) and induction of apoptotic cell death (western blot, flow cytometry, caspase assay) cells were incubated with different concentrations of ATO. Moreover, ATO was combined with another Hh antagonist - the Smoothened inhibitor itraconazole or lithium chloride for treatment of RMS cell lines. ES cell lines were cultivated with combinations of ATO, etoposide and doxorubicin.

Results: RMS and ES cell lines showed a time- and dose-dependent decrease of proliferation and induction of apoptosis using ATO. Combination of ATO with other drugs resulted in significantly improved viability and proliferation inhibition as well as cell death induction, using concentrations that were only partially effective as single agent. Moreover, ATO has been shown to reduce GLI1 and GLI2 mRNA abundance in RMS cell lines. SKMC and MSC control cells were scarcely affected by drug concentrations which generate a maximal response in RMS and ES cells.

Conclusion: These data indicate that the use of ATO in combination with other drugs may be a promising strategy for the treatment of RMS and ES.

Keywords : Ewing sarcoma, rhabdo-myosarcoma, Hedgehog pathway, arsenic trioxide
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INTERREGIONAL NETWORK FOR THE SURGICAL MANAGEMENT OF BONE METASTASES: WILL CENTRALIZATION IMPROVE THE QUALITY OF SURGICAL TREATMENTS?

Abstract ID : 1147
Submitted by : Michele Boffano the 2016-02-07 02:19:16
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Bone metastasis are increasing and they are representing an issue for National Health Systems and for oncology centres. Standardized treatments (according to national guidelines) are desirable to offer a better solution for the patient minimizing complication and undertreatment rate. The reference centre for bone and soft tissue sarcomas cannot manage directly all metastatic cases of its geographical area but can and should offer advise to other orthopaedic centres. The aim of the study is to propose a inter-regional network for the management of bone metastatic lesions under the guidance of a reference centre.
Methods
In an inter-regional based system the reference centre for bone sarcomas surgically manages the more complex cases (complex spine and pelvic metastasis, resection and reconstruction with megaprosthesis), patients living nearby the hospital, and sperimental trials for minimally invasive techniques.
Second level orthopaedic centres should manage all the bioptic procedures for metastatic lesions and surgery in all cases not above mentioned (intramedullary osteosynthesis, conventional arthroplasties, cement and plating, vertebroplasties) under the guidance of the reference centre and according to the national guidelines for bone metastasis.
Third level orthopaedic centres should not manage any case of bone metastases and should refer all the patient to a second level or to the reference centre according to the type of lesion.
Results
A digital communication network based on a videoconference system has been set up to link together the reference centre with second level centres. All the centres can revise Imaging and all the clinical notes are available. They discuss weekly all metastatic cases to achieve a consensus on the treatment. The presence of the local oncologist and radiotherapist is strongly advised.
Conclusion
The early phase of this project cannot drive any conclusion on improvements in prognosis and reduction of complications and fractures. We can observe a direct and precise strategy of treatment for metastatic patients under an inter-regional basis avoiding migration or expensive “wandering about”. Also from the educational point of view this system is very stimulating and almost no case is lost. An in-depth analysis of the future results and the diffusion of this system to other Italian areas could prove its reliability and represent the basis for multicentric studies.

Keywords : bone metastases, reference centre, surgical treatment, network
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Local relapse in patients treated in the French OS2006 study: incidence, risk factors and outcome

Abstract ID : 1529
Submitted by : Eric MASCARD the 2016-02-29 10:47:35
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives: To study the incidence, risk factors and outcome of local relapses in osteosarcoma patients treated according to the OS2006 protocol.
Methods: All patients enrolled in the French multicentre OS2006 study for an osteosarcoma of the limb who underwent surgery (radical or conservative surgery) of the primary tumour after pre-operative chemotherapy were included in the current analysis. Pre- and post-operative chemotherapy was based on high-dose methotrexate or API-AI according to the age. In addition to chemotherapy, 138 patients received 10 monthly injections of zoledronate allocated by randomisation. A competing risk approach was used to estimate the local relapse cumulative incidence, as well as risk factors for local relapse in univariate and multivariate analyses (subdistribution hazard ratios, subHR).
Results: From the 522 patients recruited in OS2006 in 40 medical centres between April 2007 and March 2014, 422 matched the eligibility criteria for the current analysis (median age 15.3 years, range 5.2 to 67). Among them, 40 patients (9%) underwent radical surgery of the primary tumour, as part of the first line treatment. With a median follow-up of 4.4 years from surgery of the primary, 27/422 patients experienced a local relapse, 22 as a first event (isolated in 9 cases and associated with metastasis in 13), 5 as a subsequent event. Taking into account the competing events (deaths without prior local relapse in 83 patients, mainly related to metastatic progression/relapse), the cumulative incidence of local relapse was 6.7% (95%CI, 4.5-9.5%) at 4 years. Overall survival was 27 % (95%CI: 13-49%) 3 years after local relapse. In univariate analysis, the only factor significantly associated with the risk of local relapse was the presence of metastases at diagnosis (subHR=2.38, 95% confidence interval, 1.05-5.39, p=0.038), whereas tumour size >10 cm, pathologic fracture at diagnosis, and a resection reported as marginal or intra-lesional were border-line significant (p=0.056, 0.078 and 0.058, respectively). No significant association was observed between these four possible prognostic factors and the risk of local relapse in multivariate analysis. We did not observe any significant impact of the number of patients operated by the surgeon during the whole study, on the risk of local relapse (p=0.93).
Conclusion: Incidence of local relapse is low in this population with a high proportion of patients undergoing conservative surgery. The local relapses were mostly combined with concomitant metastases and associated with a poor outcome. The study failed to clearly identify risk factors of local relapse.

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LONG TERM CLINICAL OUTCOMES OF OSTEOSARCOMA: A 43-YEAR EXPERIENCE IN A SINGLE INSTITUTION

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Submitted by : Bedri Karaismailoglu the 2016-02-12 21:46:47
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Neoadjuvant therapies and limb-salvage became the first choice of treatment in osteosarcoma using endoprostheses and biological reconstruction, with 60-80% survival rates. The aim of this study is to analyze the characteristics and clinical outcome of our osteosarcoma patients in last 43 years. All data of osteosarcoma patients regarding age, gender, last referral, tumour localisation, histological subtypes, necrosis rates and size of tumour after neoadjuvant therapy, metastasis and type of surgery were analyzed. From January 1972 to October 2015, 187 patients (118 male, 69 female) have referred to our clinic. The average follow up was 80 months(12-363). 169 patients underwent surgery; 10 patients with large tumours rejected offered amputation and 8 of 187 patients died before surgery due to disseminated metastasis and chemotherapy toxicity. 1 patient died of DIC after operation. Median presentation age was 17(4-69) years. 160 tumours were localized in axial skeleton or extremity without any metastasis, 27 patiens had lung metastasis at presentation. Local recurrence ratio was found 9%(16). 8 lung, 3 lymph node metastases were detected at follow up. Localisations; 97 femur, 37 tibia, 22 humerus, 13 fibula, 9 pelvis, 2 calcaneus, 2 radius, 2 sacrum, 1 scapula, 1 clavicle and 1 tarsal bones. 170(91%) were histologically high graded, while 17(9%) were low grade. 9 of low grade tumours were parosteal sarcoma. In 16 patients with local recurrence; 23.3%(7) were in large-sized (>15 cm), 12.6%(8) were in middle-sized (5-10 cm) and 10%(1) were in small-sized (<5 cm) group. Local recurrence was found to be higher in large-sized group. 28 patients underwent amputation, 12 of them didn't have any chemotherapy. In 16 patients amputation was done due to tumour progression under chemotherapy. 141 patients underwent limb-salvage surgery. 108 of limb-salvage surgeries included endoprosthetic reconstruction and 5 of them were allo/autograft-prosthetic composite. 17 patients underwent wide excision only; 14 patients reconstructed biologically(with 5 allograft, 5 autograft and 4 temporary spacer). Rotationplasty performed in 2 patients. Over-all 5-year survival rate was found 76.8%. Among 5-year survivals, 10 year survival was found 96.8%. Over-all 10 year survival was found 73.3%. 5-year disease-free survival was found 68.3%. 5-year limb survival was found 76.3%. Metastasectomy procedure was needed for 11(6%) patients, who developed lung metastasis after treatment. 9(5.2%) of patients had pathological fracture before surgery. Amputation was applied to 5, limb salvage surgery was applied to 3 of these patients. 1 patient died during preoperative chemotherapy. 78 patients received neoadjuvant chemotherapy and preoperative radiotherapy, 80 patients received neoadjuvant chemotherapy only. Recurrence ratio was found 7.7%(6) in chemotherapy and radiotherapy group; 12.5%(10) in chemoteraphy only group. When necrosis ratio was considered, only 39.1%(34) of the poor responded patients was given both chemotherapy and radiotherapy, while 60.9%(53) had only chemotherapy. 5 year survival in patients who had both chemotherapy and radiotherapy was found 80.2% and 67.9% in patients who had chemotherapy only. Neoadjuvant chemotherapy with or without irradiation enabled us to perform limb salvage majority of patients with satisfactory clinical outcome.

Keywords : osteosarcoma, neoadjuvant therapy, malignant bone tuomurs, limb salvage
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Dose-intensity relation to histologic response in Osteosarcoma patients: a new analytic approach

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Submitted by : Carlo Lancia the 2016-02-15 10:17:48
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Patients with localized osteosarcoma have survival benefit when treated in clinical trials1. However, only Adriamycin (A), Methotrexate (M), Ifosfamide (I) and Cisplatin (P) have actually shown to be active in osteosarcoma2, and the use these drugs is still debated. Using all four drugs does not increase survival compared to a 3-drug regimen3, consisting of MAP, nor has Ifosfamide shown to be a drug to salvage patients with a poor response to pre-operative chemotherapy4. Several studies investigated the effect of higher dose-intensity (DI) on outcome5,6, but no significant correlation could be established. This study aims for a new method of analysis the direct relationship between DI and histological response (HRe). The novelty of the proposed approach is that DI alterations are corrected for the patient's experienced toxicity.

Materials and Methods

This research implement a Marginal Structural Model (MSM) to analyse preoperative chemotherapy data of 364 EOI-patients treated in the EURAMOS-1 trial. MSMs can give unbiased causal estimates of the effect of regimen modifications. They mimic a randomised trial where the allocation of reductions and/or delays in the next chemotherapy cycle is not affected by the patient's past toxicity history. The focus is on the causal effect of reducing Methotrexate by one dose on HRe. A MSM with dose-delay exposure model is fitted to simultaneously capture the effect of Methotrexate reductions and delays in its administration. Age was included as a categorical explanatory variable due to the substantive interest in the causal effect of Methotrexate dosage-variations within the age range 0-9, 10-18, 19-29, and 30-40.

Results

Within the same age range, reducing Methotrexate by one course has a positive effect on HRe (OR 1.464, p-value 0.219), while delays larger than 7 days have a negative effect (OR 0.567, p-value 0.041). Age does not appear to be significant as an effect modifier of therapy alterations (0-9: reference category; 10-18: OR 1.745, p-value 0.194; 19-29: OR 1.347, p-value 0.592; 30-40: OR 1.026, p-value 0.968).

Conclusions

Strong conclusion can not be provided at present about the possibility of reducing the number of courses of Methotrexate. This study has however shown the importance of not delaying chemotherapy. Therefore, between (i) giving 2 courses of Methotrexate but delaying the cycle because of high toxicity; (ii) skipping one course of Methotrexate and not delaying the end of the cycle; the latter decision should probably be taken.

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Keywords : Osteosarcoma, Therapy alterations, Causal inference, Observational study
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The Prophylactic Antibiotic Regimens in Tumor Surgery (PARITY) Trial: Results of the pilot study and successful European expansion

Abstract ID : 1185
Submitted by : Michelle Ghert the 2016-02-10 16:27:37
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective
Clinical studies of patients with bone sarcomas have been challenged by insufficient numbers at individual centers to draw valid conclusions. The PARITY pilot aimed to determine the feasibility of conducting a definitive multi-center randomized controlled trial (RCT) to determine whether a five-day regimen of post-operative antibiotics, in comparison to a 24-hour regimen, decreases surgical site infections in patients undergoing endoprosthetic reconstruction for lower extremity bone tumors. Furthermore, the PARITY Investigators aimed to determine the feasibility of expanding the trial from North America, South America, Australia and Africa, into the European Union.

Methods
We performed a pilot international multi-center RCT. We used central randomization to conceal treatment allocation and sham antibiotics to blind participants, surgeons, and data collectors. We determined feasibility by measuring patient enrolment, completeness of follow-up, and protocol deviations for the antibiotic regimens. A clinical site in Spain was approached to legally represent the study in the European Union, and ethics applications and contract negotiations were initiated.

Results
For the pilot study, we screened 96 patients and enrolled 60 participants across 21 clinical centers in four countries (Canada, United States, Argentina and Australia). Recruitment occurred over 24 months with a mean of 2.1 participants per site per year (standard deviation 2.1). One participant was lost to follow-up and one withdrew consent. Complete data were obtained for 98% of eligible patients at two weeks, 83% at six months, and 73% at one year (the remainder with partial data or pending queries). Ninety-three percent of all post-operative doses were administered per protocol. In the pilot study, the overall event rate for surgical site infection was 14%. At the time of abstract submission, at total of 35 clinical sites in 7 countries have enrolled a total of 131 patients into the PARITY study. The first European site (Hospital Universitari Vall d'Hebron, Barcelona, Spain) opened for enrolment in January 2016 and enrolled the first European patient into PARITY in February 2016.

Conclusions
It is feasible to conduct a definitive multi-center RCT of post-operative antibiotic regimens in patients with bone sarcomas; however, further expansion of the PARITY collaborative network will be critical for recruitment of the 600 patient target sample size. We have demonstrated an ability to coordinate the PARITY trial in multiple countries, enroll participants, maintain protocol adherence, and minimize losses to follow-up. Furthermore, the PARITY trial has successfully opened and enrolled in the European Union. The PARITY Investigators invite all interested European sites to participate in this ongoing international collaborative trial in orthopaedic oncology.

Keywords : randomized controlled trial, bone sarcoma, surgical site infection, prophylactic antibiotics, collaboration
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EMSOS 2016 - 29TH ANNUAL MEETING OF THE

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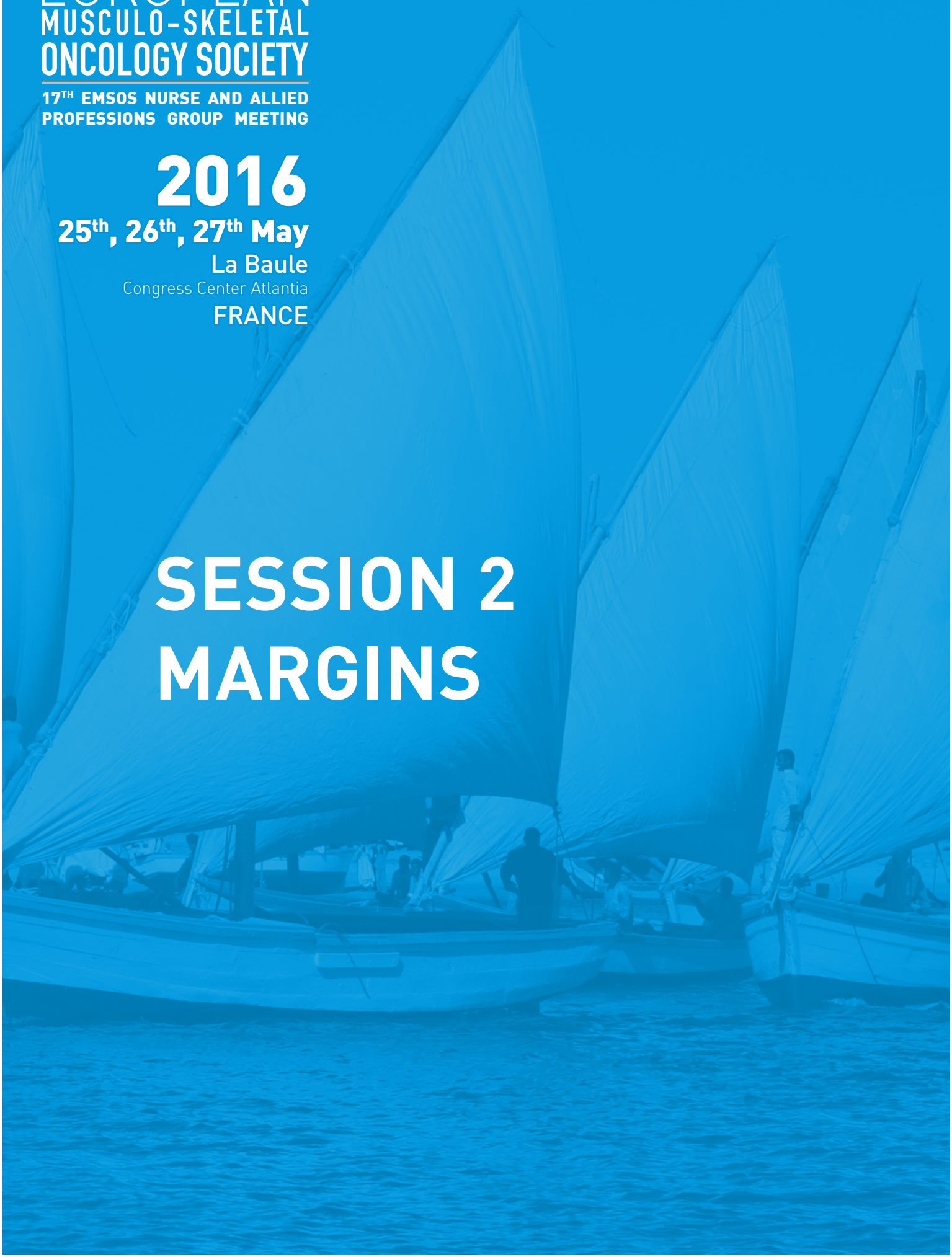

SESSION 2
MARGINS

WHY CAN'T WE ALL SPEAK THE SAME LANGUAGE? AN ANALYSIS OF THE DEFINITION AND SIGNIFICANCE OF MARGINS IN THE EURAMOS-1 TRIAL

Abstract ID : 1146
Submitted by : Robert Grimer the 2016-02-07 00:59:07
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: The EURAMOS-1 trial registered 2,260 patients from 17 countries between 2005 and 2011 of whom 1,334 joined one of two postoperative randomisations. Surgery was at the discretion of the local team and followed neoadjuvant chemotherapy(CT). Following surgery, the pathologist assessed the margins achieved by the surgeon(Enneking classification) and the response to CT (good responders <10% viable tumour; poor >10%).
This report documents the differences identified between different contributing groups (COSS, COG, EOI, SSG) in the description of the margin achieved and the significance that had on the risk of local recurrence(LR). The aim is to try and clarify what (if any) is the importance of describing the margins of excision.
Methods: All eligible patients who underwent surgery and had assessment both of CT response, margins of excision and follow up were included in the study (n=1,952).
Results: Huge variations were noted across the groups in the description of margins achieved. This could not be explained on the basis of the type of surgery carried out (Limb salvage vs amputation). The proportion with a wide or radical margin ranged from 55% in Group A to 95% in Group D but the incidence of amputation was similar across all groups (10%). (Table 1)
The relevance of these labels was explored by investigating the reported risk of LR by group and margin. For convenience, Groups A & B were combined (high reported incidence of marginal or worse margins) and Groups C & D were combined (together reported 94% of patients with wide or radical margins). Ignoring competing risks, the proportion of patients with LR for Groups A&B was 7.5% and for C&D was 6.6%.(Table 2A)
Conclusion: The definition of margins and the relevance of these varies hugely between the four groups studied. A radical excision is usually only achieved with compartmentectomy but this did not correlate well with amputation. A marginal margin would be expected to have a high risk of LR but for groups A&B, L was higher in the wide margins. Other discrepancies are explored. If however the CT response is added to the margin a more useful classification can be obtained.
The existing reporting of margins is not fit for purpose. A new (and clearer) definition is needed for osteosarcoma that has true international credibility. This should include the effectiveness of CT which has been shown to have key importance in predicting the risk of LR.

Keywords : margins, osteosarcoma, local recurrence
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Margins definition and French guidelines (GFPO, GSF-GETO) for the pathological reporting of the surgical resection specimen obtained after chemotherapy in bone sarcomas

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Submitted by : Anne Gomez-Brouchet the 2016-01-25 22:40:39
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Authorisation to disclose : Yes/Oui

INTRODUCTION
The UICC definition of residual disease (R0, R1, R2) is not sufficiently accurate and allows variable interpretation of margins, as well as the meaning of “scar tissue“
In order to improve outcomes for patients with bone sarcomas and furthermore create reliable data for national and international studies, we:
- Elaborated a standardized pathologic report to evaluate margins and response to neoadjuvant therapy after surgical resection of a bone tumor
- Defined and specified microscopic margins compared to “scar” and residual cells
- Selected the required items to be used for the diagnosis and treatment of bone sarcomas.

METHODS
Osteosarcoma and Ewing sarcoma diagnosis should be specified according the 2013 WHO classification. The Enneking and TNM (AJCC/UICC) staging were used as references for assessing the guidelines and the standardized report. The residual tumor classification defined by the UICC has been clarified as a cut off of more than 2mm as an acceptable limit to qualify a surgical resection as clear (R0). R0 and R1 status are both defined by the pathologist and the R2 status by the surgeon.

RESULTS
The pathology report should be made by an accredited bone tumor pathologist and specify :
Patient name, date of birth, gender, hospital department and surgeon name, identification and side of the bone resection, biopsy diagnosis and its reference file, tumor topography (intramedullary or surface bone tumor).
Macroscopic examination should include: specimen size, size of the tumor in three dimensions, methodology of specimen’s sections (coronal and sagittal) with photography.

Microscopic examination should specify:
- The average and highest percentage of residual tumor cells after neoadjuvant chemotherapy according to the Huvos and Rosen grading. The location of the percentage of residual tumor cells should be notified on a schema of the surgical specimen. The schema will be scanned in the definitive report.
- Is vascular invasion present?
- Whether the resection margins are clear or not should be quoted with the distance in mm of infiltrating tumor from the nearest margin and the nature of tissue at this margin. Bone and soft tissue margins should be identified.
French bone sarcoma teams have collectively defined margins as :
- R2; Macroscopic intra-lesional resection
- R1; R1a = Resection in scar tissue (fibrosis, oedema, foamy macrophages, inflammatory cells); R1b = Resection in close contact with tumour (less than 2 mm, without any normal anatomical structure); R1c = Microscopical intralesional resection (residual tumour areas, tumour areas with coagulative necrosis).
R1a and R1b margins are similar to the Enneking’s “marginal resection” .
R1c should be considered as an intra-lesional resection and should be managed such as a R2 margin.
- R0: Resection more than 2 mm of the tumor or less than 2 mm with a normal anatomical structure

CONCLUSION
Standardized reporting is intended to improve the management of bone sarcomas in the specialized centers, or multidisciplinary meetings and to facilitate collaboration between cancer units and networks. It also will provide a common database with reliable data (NETSARC, RESOS).

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Do patient-specific cutting guides enhance the accuracy of a single diaphyseal osteotomy?

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Submitted by : Gwen Sys the 2016-02-01 20:40:52
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
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Introduction. Osteotomies for bone tumor resections require the highest surgical precision in order to achieve adequate tumor margins. This study explores whether the use of patient-specific cutting guides for a single, diaphyseal osteotomy of a synthetic femoral bone results in a more accurate osteotomy in the three anatomical planes when compared to a freehand cut. Differences in guide design were analysed by comparing open and slot guides, the effect of oscillating and reciprocating saw blades and surgical experience (Two experienced surgeons and one in-training resident).
Materials and methods. For the planning of the osteotomies, the synthetic bones were optically scanned and converted into virtual 3D models. Target cut planes were defined for the different osteotomies and open and slot polyamide guides were designed for the corresponding surgical plan. Then, the synthetic bones were optically scanned with the affixed guides. The resected fragments were optically scanned and registered on the 3D models used to place the cuts in 3-Matic. The difference between the target and the performed resections was calculated as the average difference in distance (ADD) between target and the cut planes on each side of the blade at the intersection of the planes with the longitudinal axis (figure 1). Average angular deviations were quantified by measuring the intersection angle between the target plane and cut plane in the sagittal (AADS) and coronal (AADC) planes. The Kruskal-Wallis test was used to analyse the differences in accuracy between the, different osteotomy techniques, saw blades and operators (SPSS 22.0, IBM, NY, USA; $p<0.05$).

Results. Overall, ADD ranged from 0.01 – 2.09 mm, AADS ranged from 0.0 - 2.75° and AADC ranged from 0.02 – 4.14°. For all surgeons and both sawblade types, the deviation from the target cut was significantly larger for the freehand osteotomy compared to both guided osteotomy for ADD ($p= 0,025$), AADS ($p=0,022$) and AADC ($p=0,014$).
When using of a reciprocating saw, the freehand osteotomies showed significantly larger deviations for ADD ($p=0,027$) and AADS ($p=0,001$) and larger, but not significant, deviations for AADC when compared to guided osteotomies. The use of an oscillating saw resulted in significantly larger AADC ($p=0,019$) with the open guide compared to the slot guide. The use of slot guides did not lead to significant differences in accuracy for saw type or for surgeons. However, larger deviations were found for the oscillating saw compared to the reciprocating saw. When open guides were used, a markedly larger distribution for the oscillating saw (AADS range -1.25° to 0.39°, $p=0,047$; AADC range -4.94° to 1.59°, $p=0,015$) was observed when compared to the reciprocating saw (AADS range -0.82° to 0.48°; AADC range -2.79° to 0.78°). No significant inter-operator differences were found.
Conclusion. The use of patient-specific cutting guides for a single diaphyseal osteotomy resulted in a more accurate cut in all planes compared to a freehand osteotomy. Reciprocating saw blades and slot guides lead to a more accurate cut in all planes compared to oscillating saw blades and open guides. Surgical experience did not influence the accuracy of the cut.

Keywords : accuracy, margin, sarcoma, sawbone, femur
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure1.png, http://sites.altilab.com/
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Computer Assisted 3D Planning of Complex Bone Tumor Resections Improves Negative Margin Resections in a Sawbones Model

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Submitted by : Amir Sternheim the 2016-02-06 20:03:20
Category : Margins in Sarcoma
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Status : Validated
Authorisation to disclose : Yes/Oui

Objective:
Can we improve the surgical plan with the aid of computers?
Methods:
Using a novel 3-dimensional (3D) planning system we compared a computer assisted to a non-assisted plan to resect a distal femur parosteal osteosarcoma in a saw-bone model. This was identical to an actual patient scenario. Eight surgeons participated.
Results:
In the computer assisted cuts there were 4 positive margins cut in two tumor resections. In the unassisted group there were 14 positive margin cuts in 8 tumor resections. This was significantly different with regard to tumor resections (P value<0.05), as well as for separate cuts (P value<0.05). In the unassisted group there were more cuts which were far away from tumor (14 compared to 5). The resection volume was larger in the unassisted resections although not significantly different.

Conclusions:
Computer assisted planning significantly decreased the risk of positive margin resection in this sawbones model. The volume resected was smaller compared to unassisted resections. This proof of concept study sets the ground for developing intuitive planning systems.
Clinical Implication:
Computer assisted planning can improve safety and the accuracy of resections.

Keywords : Computer Assisted Planning, Sarcoma Margins
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Local recurrence in the EURAMOS-1 trial – risk factors, management and outcome

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Submitted by : Robert Grimer the 2016-02-07 00:55:11
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Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Background
The EURAMOS-1 trial registered 2260 patients from 17 countries of whom 1334 were randomised. between 2005 and 2011. All patients had preoperative MAP followed by surgery. Randomisation to postoperative chemotherapy was based on response to chemotherapy with poor responders having > 10% viable tumor and good responders <10% viable tumor.
Questions / Purposes:
This report documents the rate of local recurrence at the primary site, the risk factors, treatment and significance of local recurrence on patient survival.
Patients and Methods:
All registered patients were included. The Kaplan-Meier method was used to estimate time from surgery to local recurrence or date of last contact, and time from local recurrence to death, or date of last contact. Cox model was applied to explore risk factors for local recurrence.
Results:
Of the 2,260 registered patients, 2,140 were included in this analysis. This excludes 84 eligible patients with local recurrence reported prior to or on the date of surgery, and 36 patients ineligible due to pathology or other reasons. Median follow-up was 51 months (IQR 35-70). Of the 2,140 patients, 152 (7.1%) were reported to have local recurrence at any point after surgery. Of these 152 patients 23 had (resectable) metastases at baseline, 11 developed new metastases prior to local recurrence, 42 reported synchronous new metastases and 6 were reported to develop metastases after local recurrence. 68 of the patients with reported LR had no metastases yet (but not all groups reported events after the first one). The following risk factors for local recurrence after surgery were included in the multivariate Cox model: age, sex, site, type of surgery, histological response, metastases status at registration, fracture at surgery, surgical margins, randomisation status. The key prognostic characteristics were tumour site (axial worse HR 4.35) and histological response (poor responder worse, HR 1.57).
At 2-years after local recurrence, overall survival was 36% (95%CI 28%-44%); 48% (95%CI 38%-60%) in those with isolated local recurrence alone and 24% (95%CI 15%-34%) in patients with existing or pre-existing metastases.
Conclusions
The results show that the key risk factors for local recurrence are tumour site and histological response. Margins do not appear to have any significance.

Keywords : osteosarcoma, trial, margins, local recurrence
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Neoadjuvant radiotherapy improves local control in high grade extremity soft tissue sarcoma

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Submitted by : Michiel van de Sande the 2016-02-11 22:03:51
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Authorisation to disclose : Yes/Oui

Introduction and objectives
In clinical practice the difference in effect of pre-operative and post-operative use of radiotherapy on local recurrence(LR), distant metastases(DM) and survival, of patients with high-grade soft tissue sarcomas (STS) of the extremities remains the subject of discussion. Surgery is delayed approximately 3 months in patients receiving pre-operative radiotherapy, compared to patients receiving no or post-operative radiotherapy. Therefore it is important to assess the effect of our surgical planning and the use of radiotherapy on the course of the disease. The aim of this study was to analyze the effects of prognostic factors associated with LR, DM and overall survival in a large multicenter cohort of patients with only high-grade STS in the presence of (neo)adjuvant radiotherapy.

Methods
A retrospective multicenter analysis of 687 patients surgically treated between 2000-2010 for primary, non-disseminated, high-grade angiosarcoma, malignant peripheral nerve sheath tumor, synovial sarcoma, spindle cell sarcoma, myxofibrosarcoma, and (pleomorphic)STS not-otherwise-specified was performed.

To study the effects of presumed prognostic factors on survival a multivariate Cox-regression analysis with LR as time-dependent-covariate was performed. To study the effect of prognostic factors on LR and DM a cause-specific multivariate hazard Cox regression model with death as competing event was applied. The following risk factors were incorporated in the analysis: age at diagnosis, tumor location, size(cm), depth, histopathology, surgical margins, use of radiotherapy(pre-operative; post-operative; no radiotherapy) and primary amputation. All results were corrected for center effect. The analysis is adjusted for the fact that patients who received pre-operative radiotherapy started their treatment 3 months before surgery.

Results
Among 154 patients who received pre-operative radiotherapy, 9 (6%) developed LR, 70(45%) DM and 73(47%) patients died. Of 359 patients who received post-operative radiotherapy 63(18%) had LR, 151(42%) had DM and 175(49%) died.

The multivariate Cox regression analysis with LR as time-dependent covariate showed a significance of age(HR 2.27; 95%CI 1.28-4.02 for >50 years), size(HR 1.06; 95%CI 1.04-1.08 for every cm), and the presence of LR(HR 3.37; 95%CI 2.51-4.51) on survival.

The main prognostic risk factors for LR are tumor size(HR 1.07; 95%CI: 1.04-1.1 for every cm increase) and use of radiotherapy. Patients who received post-operative radiotherapy and no radiotherapy had 2.81 times(95%CI: 1.19-6.6) and 7.02 times(95%CI: 2.85-17.29) higher risk of experiencing LR, respectively. Wider resection margins protect for the risk of LR with HR of 0.51(95%CI: 0.32-0.8) and 0.25(95%CI: 0.14-0.47) for marginal and wide margins, respectively. The only significant prognostic risk factor for DM is tumor size(HR 1.06; 95%CI: 1.04-1.08 for every cm increase).

Conclusions
This study provides further insight into the effect of prognostic factors on the risk of LR, DM and overall survival. Particularly the difference in effect on pre- and post-operative radiotherapy in a multivariate analysis was of interest. Patients receiving pre-operative radiotherapy were less likely to develop LC when compared to patients with no or post-operative radiotherapy, even after adjusting for their delayed surgery time.

Keywords : soft-tissue-sarcoma, radiotherapy, local control, margins
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Supplementary material : http://sites.altilab.com/files/122/abstracts/tableabstract.pdf, http://sites.altilab.com/
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“Re-excision” after unplanned surgery of primary, localized and high-grade adult soft tissue sarcoma of the extremities: clinical outcome from a mono-institutional retrospective study.

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Submitted by : Andrea Sambri the 2016-02-13 09:45:26
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Unplanned sarcoma excision is still very frequent among surgeons because of clinical underestimation of soft tissue masses and frequent incomplete preoperative workout.
After sarcoma’s unplanned excision, patients are usually addressed to referral center in order to obtain adequate margins and to improve disease control.
The aim of his study is to investigate the results of re-excision after unplanned surgery of primary localized STS of the extremities in adults.
We retrospectively evaluated 452 patients with grade 2-3 STS, age>16 years, localized disease and extremities or girdle involvement; 349 were primary STS (Primary group), 103 had previously undergone unplanned excision (re-excision group). Median follow-up was 98 months (range, 2-231) for the Primary and 46 months (range 4-124) for the Re-Excision group.
In the re-excision group there were a higher number of small (<5 cm) and superficial tumors; no significantly differences were found comparing gender (p=0.537) and site (p=0.078).
In the re-excision group, residual tumor was found in 56% of the patients.
The re-excision group achieved a significant better outcome in term of overall survival (OS) (89.4% vs 67.6 %, p=0.002), local recurrence(LR) (89.6% vs 72.2 %, p=0.004) and distant metastasis(DM) (81.9% vs 68.5 %,p=0.028). The presence of residual tumor did not significantly modify 10 years OS and LR but it was statistically associated to a significant higher risk of DM (97.0% vs 67.0%, p=0.005).
The prognostic significance of an unplanned excision still remains debated with discordant results reported in the Literature. In the present series we confirm that the prognosis of a patient that underwent unplanned surgery is not compromise. In fact scar re-excision guarantee to this group of patients the same OS, LR and DM compared to STS primarily treated in a referral center. The routinely use of EBRT after positive re-excision could justify the better local control.
The presence of residual tumor seems to negatively affect DM, suggesting the use of adjuvant CT particularly in deep and large STS.
Nevertheless, prevention of unplanned surgery is the most important issue, addressing suspected lump to referral center, especially in case of a deep, bigger than 5 cm and increasing in size mass.

Keywords : soft tissue sarcoma, re-excision, unplanned
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Prognostic factors in primary myxofibrosarcoma of the extremities.

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Status : Validated
Authorisation to disclose : Yes/Oui

Myxofibrosarcoma (MFS) is one of the most frequent soft tissue tumors in elderly patients, mostly arising in the extremities. Due to its specific infiltrative pattern of growth, it shows a high propensity for local recurrence (LR) even in case of low-grade lesions and after wide resection. Local recurrences tend to progress to higher grade with an increase of metastatic potential.

We retrospectively evaluated 129 (73 M and 55 F) patients with high grade localized primary MFS of the extremities. Mean age at the time of surgery was 66 years (range, 34-91).
One hundred (78%) were in the lower limb, 15 (12%) in the upper limb, 5 (4%) in the pelvic and 9 (7%) in the shoulder girdle. Twenty-three (18%) were superficial, 106 (82%) deeply seated. Eighteen (14%) were small (<5 cm), and 111 (86%) large (>5 cm). In 119 cases (92%) tumor excision surgery was feasible, in 10 (8%) an amputation was required. In the group of excisions, margins were R0 in 84 (71%), R1 in 22 (18%) and R2 in 13 (11%). Plastic surgery was necessary in 15 cases at first surgery.

At latest follow-up (mean 55 months, range 2-221) 29 patients (22%) died of the disease and 24 (19%) because of other causes. Estimated sarcoma-specific survival (SS) was 73,2% at 5 years and 66,3% at 10 years with a better SS for superficial (p=0,011) and not recurred MFS (p=0,006). Tumor size was not significantly related to prognosis (p=0,476). Local recurrence occurred in 24 (19%) cases after a mean period of 27 months with a local recurrence-free survival of 74,3% at 5 and 10 years; LR did not significantly correlated with tumor depth (p=0.343) and quality of margins (p=0,357). Distant metastases (DM) occurred in 28 (21%) patients who developed them after mean 24 months (range 1-166) with a DM-free survival of 75,6% at 5 years and 72,9% at 10 years.

Surgical treatment and prognosis of patients affected by localized primary MFS of the extremities present peculiarities that differ from other soft tissue sarcomas. Superficial tumor location still remains the best prognostic factor, while tumor size do not always correlate with a better prognosis. Moreover adequate margins do not guarantee local control and in case of local recurrence a worst prognosis should be expected.

Keywords : myxofibrosarcoma, primary
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A Novel System for the Surgical Staging of Primary High-Grade Osteosarcoma margins of excision: The Birmingham Classification

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Submitted by : Michael Parry the 2016-02-14 16:44:59
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
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Introduction: Chemotherapy response and surgical margins have been shown to increase the risk of local recurrence in osteosarcoma patients. However existing surgical staging systems fail to reflect response to chemotherapy or define an appropriate safe metric distance from the tumour that will allow a complete excision and closely predict the chance of disease recurrence. We proposed to review a group of patients with primary high grade osteosarcoma treated with neoadjuvant chemotherapy and surgical resection and analyzed margins and chemotherapy response in terms of local recurrence.
Materials & Methods: A retrospective study was performed. All primary high-grade conventional osteosarcoma treated between 1997 and 2012, with pre-operative chemotherapy followed by surgery and under the age 50 years old were included in the study. Univariate and multivariate analyses were undertaken to identify statistically significant predictors of local recurrence (LR). The Birmingham Classification was devised on the basis of two stems: the response to chemotherapy (good response = ≥ 90% necrosis; poor response = <90% necrosis) and margins (< 2 mm or ≥ 2mm).
Results: A total of 389 participants matched the inclusion criteria. The five-year survival was 66.5% (95% CI 61.3-71.2%) and 47 patients developed local recurrence (12%). Multivariate analysis showed that intralesional margins and a poor response to neo-adjuvant chemotherapy were significant risk factors for LR. The best predictor of LR however was a combination of margins <2mm and response to chemotherapy. Two-stage Cox regression, ROC analysis, and higher Harrell's C statistic demonstrate that the Birmingham Classification was superior to the MSTS criteria as well as tumour free margins for predicting LR.
Conclusion: A combination of the recording of surgical margins in millimetres and the response to neo-adjuvant chemotherapy should be the standard practice in oncology centres treating patients with osteosarcomas and can more accurately predict the risk of local recurrence than the current MSTS system. A multi-centre collaboration study initiated by the ISOLS is recommended to test the validity of the proposed classification and allow more effective communication of margin status for research.

Keywords : Osteosarcoma, margins, classification
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MRI Evaluation of Ewing's tumors. Radiological anatomical correlation.

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Submitted by : camille thevenin-lemoine the 2016-02-15 23:56:04
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
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Introduction
The goal of surgery in Ewing's tumour is to remove the tumour by passing through healthy tissue, while preserving maximum function. Therefore surgical planning is important. Several studies have shown the benefits of MRI to determine the regional extension of the tumor. Current guidelines recommend surgical planning is based upon pre-chemotherapy MRI. However, there is a controversy whether pre or post chemo MRI enables the best surgical planning. The goal was to determine which investigation provides the more accurate planning of tumor limits.

Materials and methods
This was a single center retrospective study. 50 Ewing tumors were treated between 2005 and 2015 in our institution. 24 cases involved long bones. 2 cases were excluded because MRI was not interpretable. 22 Ewing tumours of limbs were eventually included: 7 femurs, 5 tibias, 5 fibulas, 4 humerus and 1 ulna. The average age was 17 years. MRI analysis was performed on three sequences (T1, T1 gadolinium, T2 Fat sat or Stir). MRI before and after chemotherapy were analyzed by 2 radiologists. The distance between the limit of the tumor and the ends of the bone on MRI was compared with the histology of the resection specimen. Statistical analysis was performed with the software MedCalc.

Results
The inter and intra observer reproducibility were excellent (correlation coefficients between 0.97 and 0.99). Tumor margins were significantly different between the MRI pre and post chemotherapy for all MRI sequences studied ($p < 0.005$). Correlation between MRI pre chemotherapy and histology was 0.96 (T1), 0.91 (STIR), 0.94 (T1 gadolidium). Correlation between MRI post chemotherapy and histology was excellent 0.99 for the 3 sequences. For both MRI pre and post chemotherapy, the better precision was achieved with T1 sequence. There was no benefit to gadolinium injection. Mean differences between MRI T1 and histology was 19mm (CI 6mm) before chemotherapy and 6mm (CI 3mm) after chemotherapy. Using a margin of 15mm added to the limit of the tumor on MRI T1 post-chemotherapy always lead to safe histologic margin.

Discussion and conclusion
Post chemotherapy MRI provided a more accurate assessment of the limits of Ewing's tumor. Surgical planning can therefore be based upon post chemotherapy MRI. Surgical cuts can be only 15mm away from the limits as seen on MRI. This is of major concern in children especially for metaphyseal tumors locations where accurate planning helps to preserve the joint or the growth plate.

Keywords : Ewing, margin, MRI
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Late referral of dermatofibrosarcoma protuberans patients: is “whoops” surgery the usual first approach? A multicentric study

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Category : Margins in Sarcoma
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Introduction. Dermatofibrosarcoma protuberans (DFSP) is a rare tumour accounting for approximately 1.8% of all soft tissue sarcomas with a nearly 100% five year disease specific survival rate. The treatment of localized disease is excision with clear surgical margins. After initial positive margins surgery, a wide re-excision can improve local recurrence rates. Because the appropriate tumour excision width in case of involved margins has never been defined, we retrospectively collected data from a cohort of patients managed in 2 tertiary referral hospitals specializing in musculoskeletal tumours in order to define the role of further wide re-excision surgery after initial positive margins resection.
Patients and methods: Data about 63 patients diagnosed with histologically confirmed DFSP between 1995 and 2013 were retrospectively collected from prospectively maintained databases (ROH n=48, CTO n=15). Type of biopsy, surgical margins, number and time to local recurrence or tumour spread and adjuvant therapy were analysed.
Results: Thirty-nine (81%, ROH) and ten (67%, CTO) patients underwent “whoops” procedures prior to referral to the oncology departments. No patient presented with metastasis at the diagnosis. After the first “whoops” treatment, surgical margins were intralesional in 10 (22%, ROH) and 2 patients (13%, CTO) respectively. Three (6%, ROH) and 2 (13%, CTO) patients respectively developed local recurrence after an average time of 89 and 70 months from the diagnosis. One patient (2%) developed multiple metastasis 34 months after wide tumour excision and died. Three (6%, ROH) and 2 (13%, CTO) patients respectively were treated with local adjuvant RT. Fibrosarcomatous de-differentiation was seen in 16 cases. Plastic surgical reconstruction was required in 18 cases with a higher proportion needed in those with previous “whoops”.
Conclusion: DFSP commonly underwent inadvertent “whoops” procedures prior to tertiary referral in 2 different countries. Using a well-defined surgical approach aiming for a minimum resection margin of 2cm and a standardised radiotherapy protocol, it is possible to obtain a low number of local recurrences. Wide local excisions, repeated until clear margins are obtained, are safe procedures to treat DFSP with a radical intent.

Keywords : DFSP, margins, whoops surgery, plastic reconstruction, local recurrence
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Dissection of the tumour-vessels interface. A prognostic factor for local recurrence in distal femoral osteosarcoma.

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Submitted by : Walid Ebeid the 2016-02-22 07:55:40
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Resection of distal femoral osteosarcoma that has a posterior soft tissue extent entails dissection of the popliteal vessels away from the tumour. Theoretically this will yield a less than wide margin of resection depending on the extent of the posterior soft tissue mass. The aim of this study was to correlate the relationship between the popliteal vessels and the posterior extraosseous tumour extent and dissection of this plane with local recurrence.

A retrospective study including 418 patients, 158 males and 160 females was done. The average age of the patients was 14 years (range 5 to 57 years). They all presented with non metastatic osteosarcoma of the distal femur with a posterior soft tissue extent. They all underwent routine staging and received neoadjuvant chemotherapy. The patients were divided into 2 groups according to the relationship of the popliteal vessels to the posterior extraosseous tumour extent.
Group 1 (229 patients): There was a definite clear plane between the popliteal vessels and the tumour. The popliteal vessels with its surrounding adventitia were easily dissected away from the tumour. Limb salvage was performed in all patients.
Group 2 (189 patients): The popliteal vessels were adherent to the tumour. This group was further subdivided into A and B; 2A: Patients in which the vessels were dissected and limb salvage was performed. Dissection of the popliteal vessels away from the tumour entailed stripping the vessels from its adventitia in some areas (101 patients), 2B: Patients in which no attempt was done to dissect the vessels. Amputation or rotationplasty were done (88 patients).

The average follow up period was 62 months with a minimum of 12 months and a maximum of 240 months. Pathological evaluation of the resected specimens revealed negative margins in all specimens. 249 patients (60%) were good responders to chemotherapy; 85% of group 1 (195/229) were good responders versus 29% of group 2 (54/189). Local recurrence occurred in 38 patients (9%); 8 in group 1 (3.4%) and 30 in group 2A (30%). There was one local recurrence in group 2B.
The results of this study demonstrate that patients in which the popliteal vessels were adherent to the posterior extraosseous tumour extent and were managed by dissecting the vessels away from the tumour (group 2A) had a higher incidence of local recurrence than patients in which the vessels were not adherent (group 1) and this difference was statistically highly significant (p value < 0.001). Moreover, patients in which the vessels were adherent but no attempt was done to dissect them away from the tumour (group 2B) had a lower incidence of local recurrence than patients in group 2A and this difference was also statistically significant (p value 0.007).

If you need to strip the popliteal vessels outside the adherent adventitia in order to resect a distal femoral tumour, this would be a poor prognostic factor for local recurrence. These patients should be managed by amputation, rotationplasty or resection of the vessels with the tumour and reconstruction of the vascular tree.

Keywords : osteosarcoma, distal femur, margins
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Should we excise soft tissue sarcoma beyond the infiltration?

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Submitted by : Iwata Shintaro the 2016-02-22 15:52:48
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

[Introduction] Tumor infiltration, frequently observed in spindle cell sarcomas of soft tissue, is often associated with an inadequate surgical margin and results in failure of local control. However, not enough information concerning the tumor infiltration of soft tissue sarcoma has been provided till now. The purpose of this study is to clarify 1) which subtype of soft tissue sarcoma have an infiltration property, 2) whether radiological tumor infiltration in soft tissue sarcomas correlates with histological infiltration, and 3) whether tumor resections with infiltration-free margins improve their outcome.
[Methods] We retrospectively reviewed 145 patients diagnosed with soft tissue sarcoma who underwent initial definitive surgery at our hospital between 2006 and 2014. Radiological infiltration (R-inf) was defined as a high-intensity tail-like extension along the fascial plane observed in either STIR or gadolinium-enhanced fat-suppressed (GdFS) MRI. Histological infiltration (H-inf) was also defined as the infiltrative growth of the atypical tumor cells along the fascial plane. Each distance was measured by radiologist, musculoskeletal tumor surgeon, and pathologists. Correlation between R-inf and H-inf was analyzed using the Pearson's correlation coefficient. Local control rate (LCR) and overall survival (OAS) were analyzed using the Kaplan–Meier method, and the association of potential prognostic factors with LCR and OAS were analyzed using the log-rank test and the Cox proportional hazards regression model.
[Results] H-inf was observed in 58 (40%) patients and was frequently observed in myxofibrosarcoma (72%), undifferentiated pleomorphic sarcoma (52%), leiomyosarcoma (33%), and malignant peripheral nerve sheath tumor (33%), although rare in myxoid (6%) and dedifferentiated (10%) liposarcoma. R-inf was observed in 59 (41%) patients, showing significant correlation with H-inf (P<.0001). Comparing distances of these two factors, R-inf obtained by GdFS MRI images (R2=.59) showed a stronger correlation to the H-inf than that obtained by STIR image (R2=.28). Twelve (8%) patients demonstrated local failure, and five-year OAS and LCR were 76% and 89%, respectively. Univariate analysis with 5-year LCR demonstrated that a positive margin with not only tumor mass but also infiltrative tumor cells was a significant prognostic factor compared with a wide margin (P=.0017). In the multivariate analysis, wide resection with an infiltration-free margin remained a significant factor predicting favorable local control.
[Conclusion] Tumor infiltration is common in myxofibrosarcoma and undifferentiated pleomorphic sarcoma. R-inf as assessed by GdFS MRI images highly correlated with H-inf. Our results suggest that wide resection with an infiltration-free margin would improve local control of these sarcomas. Taken together, we should excise myxofibrosarcoma or undifferentiated pleomorphic sarcoma beyond their radiological infiltrations detected by GdFS MRI image.

Keywords : Soft tissue sarcoma, Infiltration, Surgical margin
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Intra or extra articular resection for osteosarcoma around the knee. What are the rules?

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Submitted by : habib nouri the 2016-02-22 12:25:36
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Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

When limb sparing surgery is to be performed in osteosarcoma around the knee, joint involvement is one of the most important and most difficult pre operative considerations to assess, in order to decide between intra or extra articular resection. MR imaging is now the most accurate exam for detecting joint invasion. However, prior reports showed an over staging of the extension leading to unnecessary extra articular resection which is more demanding technique and with lesser functional result.
The aim of this study was to assess the reliability of MRI in choosing the type of resection in osteosarcoma around the knee.
We studied retrospectively 35 osteosarcomas around the knee. All of them were assessed preoperatively by MRI and all of them had surgical resection. MRI and resected specimen were reviewed. Articular extension was suspected by MRI in 20 cases (57%) but was confirmed histologically only in 12 cases (34%). Sixteen patients had extra articular resection. Among them, articular contamination was confirmed by histopathology only in 10 cases (62.5%). In 4 cases, there was a tumor mass inside the articular joint but was still covered by synovium; and in 2 cases, there was no articular extension of the tumor. Articular resection was performed in 19 cases. In 2 cases, tumor extended to the joint. One patient presented local recurrence and the other not. Three patterns of articular invasion were identified: throw cartilage, under the capsular or tendinous insertion or around the cartilage. Only the articular fracture had a sensitivity of 100%. Positive predictive value of an intra articular mass was only 58%, with a specificity of 84%. Joint effusion was noted in 23% of cases and was not statistically correlated with articular invasion.
Even when MRI shows intra articular mass, safe margins could be reached by intra articular resection. Although very thin, synovial membrane can be considered safe barrier. However, MRI can't detect whether synovium is breached or not. When MRI definitely shows no articular invasion, intra articular resection is performed. However, in doubtful cases, the only rule to consider is to save the life first by an extra articular resection.

Keywords : osteosarcoma, knee, resection, MRI, pathology
Authors :
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FREE COMMUNICATIONS 3

Response and outcome after neoadjuvant radiotherapy of limb soft tissue sarcomas

Abstract ID : 1432
Submitted by : Annalisa Cortesi the 2016-02-21 23:28:42
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives. To evaluate clinical-radiological response and outcome in patients with primitive or recurrent soft tissue sarcomas (STS) of extremities, treated with neoadjuvant radiochemotherapy.

Methods. Sixty patients (median age 52 years, range: 23-87), affected by primitive (54 patients, 90%) or recurrent (6 patients, 10%) STS, were treated with neoadjuvant chemotherapy (CHT) and pre-operative external beam radiotherapy (RT). Selection criteria were diseases of large dimension or in close proximity of critical structures such as nerves or vessels. The Gross Tumor Volume (GTV), defined as the macroscopic volume of disease visible in the T1-weighted sequences, was contoured based on MRI images. MRI images were merged with those of CT-simulation. For CTV definition, an expansion of 4 cm in cranio-caudal (except where anatomical barriers were present) and 1 cm in anterior-posterior and lateral-side was given to the GTV. PTV was defined as CTV + 1 cm isotropically. All patients underwent CT scan and MRI of the interested anatomical region, chest TC +/- PET before RT, at the end of RT (before surgery) and during the follow-up (FU). For a quantitative assessment, the tumor volume before and after RT was divided into quartiles.

Results. With a median FU of 58.5 months (range 12-116), only one patient had local relapse 24 months after surgery and was treated with surgical resection, with local control of the disease in the following radiological-clinical investigations. Fifteen patients (25%) developed metastases. Six out of 60 patients died (10%). Only 20 patients (33.3%) needed an adjuvant RT-boost for marginal or intralesional margins. At preoperative MRI revaluation the volumetric size of the tumor showed an average reduction of 18% (range -90% to +191%). Patients with smaller tumors at diagnosis (volume < median) showed a trend for improved 5-year metastases-free survival (MFS) and disease-free survival (DFS) (81.3% vs 64.3%; p=0.075). In patients with very large tumors at diagnosis (4th quartile), a significant volume reduction after RT was correlated with 5-year DFS and 5-year OS: 100%, both. Patients presenting with smaller, but volumetrically enlarged lesions have a 5-year DFS:50% and 5-year OS: 50%. Five-year DFS and OS of patients with volume of larger dimensions before and after RT (forth quartile) were 46.2% and 72.7%, respectively. These observed data for the tumor volume changes showed statistical significance with p:0.002 and p:0.027 for DFS and OS respectively.

Conclusion. In this series of patients treated with preoperative RT, a high LC rate was recorded. The volumetric change of tumor size significantly predicts patients outcome. Prospective studies on neoadjuvant setting of STS are still necessary to improve these results.

Keywords : sarcoma, neoadjuvant radiotherapy
Authors :
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Soft tissue masses with cystic appearance due to myxomatous stroma: Can conventional magnetic resonance imaging differentiate benign from malignant tumours?

Abstract ID : 1093
Submitted by : Amandine CROMBE the 2016-01-26 18:11:37
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives: To retrospectively evaluate the diagnostic performance of morphological signs observed on conventional magnetic resonance (MR) imaging to differentiate benign from malignant peripheral solid tumours of soft tissue with cyst-like appearance due to myxomatous stroma.
Methods: MR images from 95 consecutive histopathologically proven tumours (26 benign and 69 malignant) of soft tissues with myxoid components were evaluated in our tertiary referral centre. Two radiologists, blind to pathology results, independently reviewed conventional MR sequences including at least a) one T2-weighted sequence with or without fat suppression; b) one T1-weighted sequence without fat suppression; and c) one T1-weighted sequence with gadolinium-complex contrast enhancement and fat suppression. Multiple criteria were defined to analyse morphology, margins, architecture and tumour periphery and evaluated for each lesion. Intra- and inter-observer reproducibility and Odds ratios were calculated for each criterion.
Results: The most relevant and reproducible criteria to significantly predict malignancy were: (1) ill-defined tumour margins, (2) haemorrhagic component, (3) intra-tumoural fat, (4) fibrosis and (5) “tail sign”. A lesion is classified as malignant if any of these 5 criteria is present, and benign if none of them are observed. Therefore, this combination provides a sensitivity of 92.86% and a specificity of 93.3%.
Conclusion: Conventional MR imaging provides reproducible criteria that can be combined to differentiate between benign and malignant solid tumours of soft tissue with cyst-like appearance due to myxomatous stroma. To avoid the rare false negative, additional careful analysis of the location must be performed including the muscle and articulation proximity

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Keywords : myxoid, MRI sarcoma, PNST, myxoma
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figures-emsos.pdf, http://sites.altilab.com/
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The impact of margins in Desmoid tumour surgery

Abstract ID : 1132
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Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Desmoid tumors are unpredictable in their behavior. Established are surgical treatment, as well as radiation and various systemic therapies. Aim of this study was to clarify the impact of margins in surgery and make recommendations for future treatment.
Patients and Methods
From 1981 to 2014. 53 treatments were performed in 44 patients. At the time of diagnosis the average age of the 19 males was 40.9 years, of the 25 females 39.9 years. Locations had been the shoulder in 17%, the upper arm, the trunk and the thigh in 13% each, the pelvis in 11%, the lower leg and foot in 9% each. Lower arm and axilla had been involved in 4% , neck, hands and knees in 2% each. A multilocular manifestation was seen in 4 patients.
As symptoms in 66% swelling and in 56% pain were most common. Paresthesia and limitations in movement were seen in 8% each, incidental and follow-up findings in individual cases. In total 53 treatments in 37 primary patients and 16 recurrent cases had been done. Performed had been in 16 cases a R0- in 28 cases, a resection with positive margins (R1) and in 6 cases a R2-resection. 5 patients received therapy with NSAIDs, 20 patients were irradiated, one patient received Tamoxifen, 3 patients received Imatinib and one patient had chemotherapy. Follow-up was possible in 47 cases.
Results
2 patients died independently to tumour. Patients with persistence of the tumor (R2-resections) and patients treated conservatively are considered separately. In case of a R0-resection local recurrence was 20%. In case of a R1-resection 29% (Figure 1, p=0.54). Considering radiation, neither in the R0- patients (in 4 cases, radiotherapy) nor in R1-resected patients (12 radiotherapy), a significant difference was seen.
In 6 R2-resections 2 patients had additonal radiotherapy. One patient remained without progression, one patient could not be reached for follow-up. In 4 cases, there was no further therapy. 2 patients showed no progression, one patient was progressive, another patient could not be tracked.
In 3 cases (each recurrence) there was no further surgical treatment. One patient received NSAIDs and remained without progression. One patient is progressive after radiation and one patient showed a response with Imatinib.
From 47 trackable cases 36 (77%) were free of tumour. 2 out of 16 relapsed cases are not trackable and 10 are free of tumour (71%). In 37 primary cases 4 are not trackable and 26 free of tumour (79%).
Summary
In all but one case (end of a toe) amputation could be avoided. The course of the disease was found completely unpredictable, both in watchfull waiting, as well as under systemic therapy, stable or regressive follow-ups had been seen. Regarding surgery, no benefit of a R0-resection was seen, as also no positive effect of radiation could be shown neither in the R0 as also the R1-resected patients. Whether it was a primary or recurrent tumor remained without significance to local recurrence. In total free of tumour was achieved in more than ¾ of the cases.

Keywords : Desmoid tumour, aggressive fibromatosis, margins, surgery, recurrence
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1.jpg, http://sites.altilab.com/
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The Influence of unplanned excision in stage III soft tissue sarcoma.

Abstract ID : 1224
Submitted by : Frank Traub the 2016-02-12 09:26:19
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives:
Soft tissue sarcomas are a group of rare mesenchymal neoplasms comprising 1% of all malignant tumors. Unfortunately it is not uncommon for patients with soft tissue sarcomas to present and be treated initially in the community setting as potentially benign lesions. This situation usually leads to an inadequate sarcoma excision, often referred to as a “Whoops! Procedure” with subsequent referral to a specialty sarcoma center. Inadequate excision of large, deep and high grade sarcomas, commonly referred to as stage III tumours, presents significant challenges to the multidisciplinary treatment team and is thought to put the patient at high risk of disease recurrence, complications, and poor functional outcome. The purpose of this study was to determine the impact of an unplanned sarcoma excision on treatment and subsequent oncologic and functional outcome for patients with stage III extremity soft tissue sarcoma.
Materials and Methods:
From the prospectively collected database at a tertiary referral sarcoma center, we identified all patients with large, deep, high grade and localized (ie Stage III) soft tissue sarcomas of the extremities treated between 1989 and 2010 Patient records were reviewed to identify patient demographics, tumor details, treatment, complications, function and oncologic outcomes. Patients with stage III extremity soft tissue sarcomas who underwent an initial unplanned excision elsewhere and then re-excision in the sarcoma center (Group 1: Re-excision treatment) were compared to patients who had an initial planned sarcoma resection at our centre (Group 2: Planned treatment).
Results:
500 patients with stage III soft tissue sarcomas of the extremities were identified of whom 94 patients (18.8%) presented following a previous inadequate excision performed elsewhere (Group 1). All 94 patients in Group 1 underwent re-excision in an attempt to achieve clear margins. After re-excision, 12.7% of these patients had positive resection margins and 82.9% had residual tumor identified histologically in the re-excision specimen. In the Re-excision Group, the rate of skin grafts, rotational or free flaps and amputation was significantly higher compared to patients in Group 2 who underwent an initial Planned sarcoma resection (p=0.013). The rates of local recurrence, metastasis-free survival and overall survival were not significantly different between the two groups. Radiotherapy and chemotherapy was applied equally to both groups. Function following Re-excision or Planned Treatment were not significantly different (p-value 0,24).
Conclusion:
Initial unplanned excisions of Stage III soft tissue sarcomas leads to an unfavorable clinical course and necessitates more extensive surgery as evidenced by higher rates of skin grafts, flaps and amputations, but without a negative effect on oncologic outcomes after wide re-resection and multidisciplinary treatment.

Keywords :
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What is the morbidity of a non-invasive growing prosthesis?

Abstract ID : 1143
Submitted by : Magdalena Gilg the 2016-02-06 20:40:22
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : No/Non

Background: Extendible endoprostheses have been available for more than 30 years and have become more sophisticated with time. The latest generation is 'non-invasive' and can be lengthened with an external magnetic force. Early results from several centres have shown worryingly high complications such as infection. This study investigates the incidence of complications and the need for further surgery in a cohort of patients with a non- invasive growing endoprosthesis.
Methods: All patients with a non- invasive extendible prosthesis from a single tertiary referral hospital implanted for a primary bone sarcoma with at least 24 months follow-up for those still alive were included in the study. The incidence of complications and further surgery was documented.
Results: 51 patients had a non- invasive growing prosthesis inserted between 2003 and June 2014 with a mean follow-up of 59 months (range 17-134). Age ranged from 6 to 14 years (mean 10.4 years). Overall survivorship of the patients was 84% at 3- and 68% at 5-years. The overall risk of revision was 38 % at 5 years and 44 % at 10 years with competing risk analysis. Deep infection arose in 19.6 % of patients at a mean of 12.5 months (range 0-55). Other complications seen were failure of the lengthening mechanism (n=5, 9.8%) and implant breakage (n=2, 3.9%). Overall, patients in this series underwent a total of 51 additional surgeries (mean 1.04, range 0-5 per patient). Average limb-length discrepancy was 4.31mm (range 0-25) and mean MSTS functional score was 25 (range 18-30) at last follow-up.
Conclusions: When compared to the early results previously published, this longer term series has shown continued good functional outcomes and compensation of leg-length discrepancies. Infection is still the most common complication, with postoperative wound healing problems, central line infection and proximal tibial location as the main risk factors.

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Superficial soft-tissue sarcomas: how should they be managed?

Abstract ID : 1366
Submitted by : Jonathan Stevenson the 2016-02-17 15:51:41
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives

Primary superficial soft-tissue sarcomas (SSTS) represent a distinct entity with a favourable prognosis1 dictated by size and grade2. We aimed to review the outcomes of sarcomas superficial to the deep fascia presenting to a tertiary Orthopaedic Oncology centre in the UK. Patients are routinely staged before surgical excision, however patients who had undergone a previous inadvertent excision underwent pathological review, followed by a surgical site MRI and a tumour bed re-excision.

Patients and methods

We undertook a retrospective review of superficial soft-tissue sarcomas identified from a prospectively collected database. This identified 602 cases between 2000 and 2013 inclusive. Univariate analysis of local recurrence free survival (LRFS), disease free survival (DFS) and overall survival (OS) was calculated using Kaplan-Meier survival curves. We analysed tumour size and grade, margins, adjacent tissue type, inadvertent excision, localised plastic surgery and adjuvant therapies.

Results

The 602 patients were diagnosed at an average age of 58.6 years; of these 298 were female, 304 were male. Two hundred and ninety patients were newly diagnosed and staged before excision, 283 patients had undergone a prior inadvertent excision and 29 patients had a local recurrence of a previously treated SSTS. The mean tumour size was 5.82cm (range 0.1 - 27cm). 308 tumours (51%) were classified as large (>5cm). There were 335 on the lower limb (56%), 137 axially (23%) and 129 on the upper limb (21%). 57% of tumours were high grade, 24% were of intermediate grade and 19% were low grade.
After two years OS was 82.4%, LRFS was 77% and DFS was 71.9%. OS for the newly diagnosed group was 78% at 2 years versus 87% after inadvertent excisions (p=0.006); the inadvertent excision tumours tended to be smaller and lower grade and underwent secondary wider excisions. Plastic surgical procedures, adjuvant therapy, margins and the nearest tissue invaded had no impact on the disease free survival nor overall survival. Size (>5cm) and grade were statistically significant for prognosis.

Conclusions

Tumour size and grade were predictive of survival. Patients with inadvertent excisions did not have worse outcomes, but better overall survival after secondary wider excisions of smaller, lower grade superficial soft-tissue sarcomas.

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Keywords : soft-tissue sarcoma, superficial, subcutaneous
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Local recurrence, distant metastasis, and death in patients with soft tissue sarcoma (STS) after curative resection: A multi-state model

Abstract ID : 1411
Submitted by : Florian Posch the 2016-02-21 16:29:44
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Baseline risk factors such as the AJCC staging system inform the prognosis of patients with soft tissue sarcoma (STS) undergoing curative surgery. However, the long-term survival of these patients may also be influenced by intermediate events occurring during follow-up, such as local recurrence and distant metastasis. The influence of these events on survival has not been quantified so far. Here, we use multi-state modeling to statistically dissect the relationship between local recurrence, distant metastasis and death due to STS or other causes.
Methods: In this single-center historical cohort study, we followed 444 patients with localized STS (AJCC stages I-III; median age: 62.6 years, female: n=217 (48.9%)) who were treated with surgery in curative intent between 1995-2015. Two-hundred-sixty-one (58.8%) patients received adjuvant radiotherapy, and 40 (9.0%) received adjuvant chemotherapy. After a median follow-up period of 5.5 years, we observed 44 (9.9%) local recurrences, 74 (16.7%) occurrences of distant metastasis, 64 (14.4%) STS-related deaths, and 59 (13.3%) deaths adjudicated to other causes. The association between clinical events occurring during follow-up were analyzed with semi-Markov multistate models.
Results: Fifteen-year overall mortality was 55.3% (95%CI: 44.4-66.9), and 15-year sarcoma-specific mortality was 25.7% (95%CI: 18.7-33.2). The 15-year cumulative incidences of local recurrence, distant metastasis, and overall recurrence were 15.9% (95%CI: 10.9-21.9), 21.1% (95%CI: 16.9-25.7), and 31.8% (95%CI: 25.6-38.1), respectively. In multi-state analysis, the onset of local recurrence was associated with a 3.6-fold increase in the risk of distant metastasis (Transition hazard ratio (THR)=3.59, 95%CI: 1.62-7.95, p=0.002), and a 2.9-fold increase in the risk of death (THR=2.85, 95%CI: 1.73-4.69, p<0.0001). The occurrence of distant metastasis was associated with a 12.6-fold increase in the risk of death (THR=12.65, 95%CI: 8.73-18.33, p<0.0001). Distant metastasis occurring after a long tumor-free interval did not exhibit a more favorable prognosis with respect to mortality than distant metastasis occurring early after surgery (p=0.28). In landmark analysis, the 15-year overall survival of patients that had developed local recurrence and/or distant metastasis within the first 3 years after baseline was far worse than the overall survival in patients that had not developed these intermediate events within 3 years (18.0% vs. 64.5%, p<0.0001). Tumor grade G3 emerged as a significant predictor of both a higher risk of recurrence (THR=3.39, 95%CI: 2.11-5.43, p<0.0001), and a higher risk of death after developing recurrence (THR=1.84, 95%CI: 1.04-3.26,p=0.04).
Conclusion: In patients with localized STS undergoing curative surgery, the occurrence of local recurrence and distant metastasis contributes to a dramatically impaired long-term survival experience. Despite optimal surgical management, local recurrences represent a significant risk factor for distant metastasis. Distant metastasis after a long tumor-free interval harbors an equally dismal prognosis than early-onset metastasis. Higher tumor stages at baseline accelerate the time-to-death after the onset of recurrence.

Keywords : soft tissue sarcoma, recurrence, death, multi-state
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Survivorship Of Patients With Skeletal Metastasis Associated With Soft Tissue Sarcomas. Is Routine Skeletal Survey Needed During Follow Up Of These Patients?

Abstract ID : 1459
Submitted by : Michael Parry the 2016-02-22 11:40:43
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:

Knowledge about the natural history of soft tissue sarcomas (STS) has improved but there remains limited knowledge about the incidence and prognosis conferred by osseous metastases from STS. The aim of this study was to identify the incidence of osseous metastases associated with STS, to understand the natural history of these metastases, and to identify risk factors associated with the development of such metastases and the effect on oncological outcomes following their development.

Patients and Methods:

Patients with a histologically confirmed STS in our institution between January 1983 and December 2014 were included. Details included patient age, gender, tumoural characteristics, site, histological grade of tumour and primary site. The presence of metastasis, including the site and number, and survivorship after metastasis were collected. The presence of skeletal metastases was confirmed following imaging based on clinical suspicion. Disease free and overall survival was assessed using the Kaplan-Meier method. Univariate and multivariate analysis was used to assess the affect of the development of osseous metastases on overall survival, with a significance value of $p<0.05$.

Results:
Of the 3835 patients diagnosed with STS, 1079 patients were diagnosed with metastases and 175 (16.2%) were found to have one or more skeletal metastases (4.5% of all STS) at presentation or during follow up. Of the 175 patients, 109 were male (62.3%) and the mean age of all 175 patients was 49.4 years (range 2-84). 67 % of STS were located in the lower limb.

Of the 128 patients who developed metastases during follow up, the mean time to metastases was 24.6 months (3-168) for skeletal metastasis. 126 of the bone metastases were in the axial skeleton and 49 in the appendicular skeleton.

Of the 128 patients, 50 developed isolated and 13 patients developed multiple bone metastases as their first site of distant disease, which predominantly involved the spine and pelvis.

29 different histological subtypes of STS were included in the study, of which myxoid liposarcoma and liposarcoma were the most common. Bone metastases were identified in 13 patients with low-grade tumours, 41 in intermediate tumours and 121 patients with high grade tumours.

At final follow-up, 163 of the 175 (93.1%) patients had died. The mean survival for the cohort of patients with skeletal metastases (n=175) was 36.4 months (range 0-228 months) from diagnosis of STS. The mean survival for patients with bone metastases was 15 months from the time of diagnosis to the diagnosis of metastases.

According to histological subtype, patients with a STS of vascular origin and soft tissue Ewing’s sarcoma had the worst over all survivorship.

Discussion:

Bone metastases following a STS are not uncommon and 4.5% of all patients with a STS will experience during their disease course. In any patient with a past history of STS and with skeletal symptoms, the possibility of skeletal metastases should be considered and they should be investigated accordingly, especially for those subtypes that metastasize to bone more frequently than others (myxoid liposarcoma, Ewing sarcoma, angiosarcoma).

Keywords : Soft tissue sarcoma, osseous metastases, survival
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Predictors of Blood Transfusion and Wound Infection Following Surgical Resection of Soft Tissue Sarcoma: Analysis of 788 Patients in ACS-NSQIP Database.

Abstract ID : 1350
Submitted by : Krista Goulding the 2016-02-16 17:53:54
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Wound complications are common in patients with soft tissue sarcomas (STS) treated with surgical excision. Limited data is available on predictive factors for wound complications beyond the relationship to neo-adjuvant or adjuvant radiotherapy. Likewise, the association between blood transfusion, patient comorbidities and post-operative outcomes is not well described.

Purpose: To identify predictive factors for blood transfusion and wound complications in patients undergoing surgical resection of soft tissue sarcoma from a national cohort.

Methods: The American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database was used to identify patients who underwent surgical resection of a STS from 2005 to 2013. Primary malignant soft tissue neoplasms were identified using the following ICD-9 codes: 171.2, 171.3 and 171.6. Patients treated with both wide excision and amputation were identified using the current procedural terminology (CPT) codes. Prolonged operative time was defined as greater than 90th percentile of time required per procedure. A multivariable logistic regression model was used to identify associations between patient factors and post-operative wound complications (superficial and deep surgical site infections (SSI), and wound dehiscence). A similar regression model sought to identify prognostic factors for blood transfusion and associations with post-operative outcomes.

Results: A total of 788 patients met our inclusion criteria. Of theses, 506 (64.2%) had tumors in the lower limb, 182 (23.1%) patients had tumors in the upper limb, and 100 (12.7%) patients had pelvic tumors. Six hundred and forty patients (81.2%) underwent surgical excision; 148 (18.8%) patients had an amputation. The cumulative incidence of any SSI developed 30-day post-operatively was 7%. Multivariable logistic regression modeling identified American Society of Anaesthesiologist (ASA) class 3 and 4 (OR= 2.3, P=0.03; OR=8.3, P=0.001, respectively), amputation (OR=14.0, P<0.001) and prolonged operative time (OR=4.61, P<0.001) as significant predictors of blood transfusion. Radiotherapy (OR=2.63, P=0.01) and amputation (OR=2.63, P=0.01) were identified as predictors of superficial SSI, whereas ASA class 4 (OR=6.25, P=0.03), prolonged operative time (OR=3.93,P=0.012) and return to the operating room (OR=10.54, P<0.001) were associated with deep SSI. Male gender (OR=1.82, P=0.03), diabetes (OR=2.30. P=0.03), ASA class 3 (OR=2.40, P=0.003), amputation (OR=3.8, P<0.001) and steroid intake for chronic disease (OR=4.50, P=0.03) were identified as predictors for wound dehiscence and open SSI.

Conclusion:
A national cohort demonstrates that male gender, diabetes, chronic steroid use, higher ASA score and radiotherapy are associated with an increased incidence of wound complications. One in six patients undergoing resection of an STS will require a blood transfusion, and this risk is correlated with amputation, prolonged operative time and increased ASA score. Strategies to decrease the risk of blood transfusion and wound complication should be considered for these patient groups.

Keywords : Soft tissue sarcoma; surgical site infection; blood transfusion
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Major wound complication risk factors following soft tissue sarcoma resection

Abstract ID : 1521
Submitted by : Sophie Mottard the 2016-02-25 13:15:08
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Wound-healing complications represent an important source of morbidity in patients treated surgically for soft tissue sarcomas (STS). The purpose of this study was to determine which factors are predictive of major wound complication rates following STS resection, including tumor site, size, grade, and depth, as well as radiotherapy and chemotherapy.
We reviewed 256 cases of STS treated surgically between 2000 and 2011. The primary outcome was occurrence of major wound complications post STS resection.
Major wound complications were more likely to occur post STS resection with larger tumor diameters (p=0,001), high grade tumors (p=0,04), location in the proximal lower extremity (p=0,01), and use of prepreoperative radiotherapy (p=0,01). Tumors located in the adductor compartment were at highest risk of complications. We did not demonstrate a significant difference in complications rates based on method of closure. Diabetes, smoking, obesity, tumor diameter, tumor location in the proximal lower extremity, and preoperative radiotherapy were independent predictors on multivaraite analysis.
There are multiple predictors for major wound complications post STS resection. A more aggressive resection irradiated soft tissues, combined with primary reconstruction, should be considered in cases with multiple risk factors.

Keywords : Wound, Complication, Sarcoma, Risk, Factor, Ressection
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En bloc resection of malignant or local invasive tumors involving thoracic or lumbar vertebrae： xperience from Peking University People's Hospital

Abstract ID : 1079
Submitted by : Xiaodong Tang the 2016-01-22 06:29:26
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: En bloc resection is necessary to control spinal malignant or local invasive tumors. For highly demand of surgical skill, with high rate of local recurrence and poor prognosis, it's worthwhile to evaluate the results of oncology, neurological function, and complication of this procedure. Methods: 38 patients who received en bloc tumor resection involving thoracic or lumbar vertebrae between January, 2008 and May, 2015 were retrospectively reviewed. There were 24 male patients and 14 female patients, with a mean age of 38.7 years (range, 11 to 66 years). The local invasive tumors were diagnosed in 12 patients including 10 giant cell tumors, 1 osteoblastoma, and 1 chondroblastoma. The malignant tumors were confirmed in 26 patients including 6 chondrosarcomas, 4 osteosarcomas, 2 Ewing's sarcomas, 1 undifferentiated pleomorphic sarcomas, and 13 solitary metastatic tumors. Tumors involved cervical thoracic spine in 2 patients, thoracic spine in 26 patients, and lumbar spine in 10 patients. The combined anterior and posterior approaches were adopted in 11 patients, while other patients had single posterior approach. The partial and total en bloc vertebrectomy were carried out in 6 patients and 30 patients, respectively. Results: 35 patients had fully followup with a mean time of 38 months (range, 6 to 102 months). The mean operation time was 415 minutes, and the average blood loss during operation was 4144ml（range, 1000 to 11500ml）。tumor local recurrence occurred in 13 (37.1%) patients. At the end of followup, 17 patients survived with no evidence of disease, 10 patients were alive with disease, and 8 patients died of disease. Thirteen (37.1%) patients had one or more complications including cerebral spinal fluid leakage, epidural hematoma, chylous leakage, thoracic cavity effusion, deep infection, pulmonary infection, surperficial wound problem, and fixation failure. A stable or an improved neural function was presented in all patients. Conclusion: En bloc resection should be carried out in patients with malignant or local invasive tumors involving thoracic or lumbar spine. Although, it has some complications, tumor local control and good function still could be obtained.

Keywords : Surgery; spine; Neoplasm; En bloc resection
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Silver-coated Megaprostheses of the Proximal Tibia in Patients with Bone Sarcoma

Abstract ID : 1073
Submitted by : Jendrik Hardes the 2016-01-15 17:19:10
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives: The placement of megaprostheses of the proximal tibia in patients with bone sarcoma is associated with high rates of infection. Silver-coated megaprostheses resulted in reduced infection rates in studies with small patient groups and a short follow-up. To the best of our knowledge this study is the largest one which compares the infection rates of titanium vs. silver-coated megaprostheses in sarcoma patients of the proximal tibia.
Methods: The infection rate in 98 patients with sarcoma or giant cell tumour of the proximal tibia who underwent placement of a titanium (n=42) or silver-coated (n=56) megaprosthesis (Mutars®) was assessed, along with the treatment administered for a possible infection.
Results: In the case of infection as the primary endpoint of the study 16,7% infections in the titanium and 8,9% in the silver group were observed resulting in a 5-years prosthesis survival of 90% in the silver and 84% in the titanium group. Overall, in the silver group seven out of 56 patients (12,5%) developed a periprosthetic infection because two patients get infected after a revision surgery due to a mechanical failure of the prosthesis. In the titanium group one patient developed a periprosthetic infection after a revision surgery (which occurred in 50% of patients) due to a mechanical prosthetic failure resulting in an overall infection rate of 19,0% (8 out of 42). Overall, nine out of twelve (75%) periprosthetic infections in both groups occurred within the first two postoperative years, if no later revision surgery due to mechanical failure was necessary.
Whereas three of the eight patients in the titanium group (37,5%) ultimately had to undergo amputation due to infected proximal tibia replacement, these mutilating surgical procedures have been necessary in the silver group in one patient only (14,3%). Whereas in the titanium group, two-stage revision surgery with a temporary antibiotic-impregnated cement spacer was ultimately successful in four of eight patients (50,0%), it was necessary in one patient (14,3%) in the silver group only.
Conclusion: The use of silver-coated prostheses reduced the infection rate in a relatively large and homogeneous patient group. In addition, less aggressive treatment of infection was possible in the group with silver-coated prostheses.

Keywords : prosthesis-related infections; bone neoplasms; silver; implantation; proximal tibia
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Prognostic Factors in Angiosarcoma

Abstract ID : 1294
Submitted by : Michael Parry the 2016-02-14 18:09:11
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Angiosarcoma is a rare and aggressive type of soft tissue sarcoma, which has a high reported rate of local recurrence. It originates from the endovascular tissues and can be primary in origin or secondary to radiation therapy. The commonest involved site is the head and neck region followed by breast tissue and chest wall. Surgical resection with clear margins is the mainstay of treatment whereas further adjuvant treatments have some debatable role.

Materials & Methods: We present our experience of managing 53 cases over a period of 20 years, with 60% of the cases being primary in origin. The median age for the whole cohort was 69 years with 70% of the patients being females. Extremities were involved in 53% of the cases in primary disease and breast and chest wall was the commonest (90%) site for secondary disease. Approximately 89% of these tumours were high-grade lesions and 83% were non metastatic at presentation and lymph nodes being the commonest site of metastasis for all patients.

Results: Surgical resection was performed in all except 2 patients (palliative) and wide surgical margins were achieved in 76% of these patients. Local recurrence (LR) was reported in 18.8% and 47.6% of primary and secondary cases respectively, with surgical margins being a significant prognostic factor for LR. However, metastatic disease was commonest in primary disease (51.9%)
Median time to LR and metastasis from diagnosis was 7 and 9 months respectively. The overall survivorship for the whole cohort from the date of diagnosis was 32%, whilst those with primary disease fared considerably better than those with secondary tumours.

Conclusion: Grade of tumour, primary or secondary disease, surgical margins and early development of LR/metastasis were significant prognostic factors for overall survivorship of patients with angiosarcoma. Considering the aggressive behavior of this rare disease, we propose a multidisciplinary approach in specialist units and further research into adjuvant treatments to improve the overall survivorship.

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Aseptic Loosening of Implants after Oncological Knee Replacement

Abstract ID : 1363
Submitted by : Ilkin Mikailov the 2016-02-17 10:28:29
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

The follow-up includes 252 cases of knee arthroplasty in patients with benign aggressive or malignant tumor of the knee joint performed from 1993 to 2015 in our department. In all cases we used hinged modular oncological endoprostheses with the rotary platform. The value of resection was from 7 to 24 centimeters. The total number of complications was 89 (35,3%). Aseptic instability arisen in terms from 1 to 20 years after primary surgery and included 26 (10,3%) cases. The number of the distal femur resection performed in this group was 10 (38,5%), of proximal tibia – 16 (61,5%). Isolated instability of the femoral component was identified in 22 cases and simultaneously femoral and tibial components in 4 cases. No one case of isolated loosening of tibial component independently of the value of resection and the localization of the tumor or fixation method (cement or cementless) was detected. Totally there were implanted 21 cementless and 5 cemented stems. The dynamics of aseptic loosening was analyzed by using X-ray. Short term instability was detected an average of 12-18 months after primary surgery and amounted 13 patients. In all these case cementless stems were used. Stem length was from 10 to 15 cm. When we analyzed the X-rays of patients with unstable components of the cement fixation, we found that the diameter of the used stems was insufficient and as a result the thickness of the cement mantle was from 3 to 5 mm, obviously this could lead to early loosening.
Based on our experience we have been able to work out the basic principles of knee arthroplasty in patients after tumor resection:
• For the femoral component is necessary to use cemented stems, careful observance of the rules of cementation technic, optimal selection of stem diameter maximizes extend the life of the implant. The thickness of the cement mantle should not be more than 2 mm.
• Cementless stems can be used only in young patients and for tibia components implantation.
• When large resections are performed the length of the stem should not be less than 12 cm
• When using the cementless fixation complete axial loads on the operated limb can be allowed not earlier than 3 to 5 months after surgery.

Keywords : Aseptic Loosening, Oncological Knee Replacement
Authors :
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Massive endoprosthetic replacement of the proximal femur for bone tumours: Experience from the Royal National Orthopaedic Hospital, Stanmore

Abstract ID : 1417
Submitted by : Euan Stirling the 2016-02-21 20:07:22
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Massive endoprosthetic replacement of the proximal femur for bone tumours: Experience from the Royal National Orthopaedic Hospital, Stanmore
Stirling ERB, Mumith, A, Gikas PD, Jagielo JM, Aston WJS, Skinner JA, Pollock RC, Briggs TWR

Introduction
Endoprosthetic femoral replacement may be indicated for treatment of primary bone tumours, and increasingly for metastatic disease due to advances in adjuvant and neoadjuvant therapies. Surgery is highly invasive with a significant number of potential complications, and is therefore typically performed at specialist centres. This study aims to report outcomes of proximal femoral replacements performed at the Royal National Orthopaedic Hospital, a leading international orthopaedic centre, over a 13-year period from 2000-13.
Methods
Patients were identified through an electronic search of hospital coding records. A retrospective review of casenotes was performed noting specific aspects of surgical technique and implants used including reattachment of the abductor musculature. Follow-up records were analysed to identify incidence of post-operative complications including infection, recurrence and dislocation rates, and to determine prosthesis and patient survivorship. Patient reported outcomes were assessed using the Musculoskeletal Tumour Society functional outcome score.
Results
212 proximal femoral replacements were performed at our institution between 2000-13, for metastatic disease in 107 cases, primary bone tumours in 93 and other tumours in 12. Mean follow-up was 31.4 months (0-174 months). Patient survival was significantly better at both 1 and 5 years for patients with primary tumours compared to metastatic disease. Post-operative dislocation, at a mean time of 5 months, was reported in 41 patients. 78% of dislocations occured in patients where acetabular resurfacing had been performed (p=0.008), and dislocation rate was reduced by abductor repair using a trochanteric reattachment plate (p=0.06) or a tumour tube (p=0.005) compared to simple closure. Deep infection occurred in 9 (4%) patients, and local recurrence was reported in 12 (6%) patients. A mean MSTS score of 20 (13-28) was calculated for 38 of the surviving 76 patients surveyed.
Discussion
Our data reports outcomes from one of the largest case-series of patients to have undergone proximal femoral replacement for treatment of bone tumours, from a single orthopaedic centre. The data demonstrate significant findings relating to the risk of post-operative dislocation dependent on the components used during surgery.

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Results of distal femur Endoprosthetic reconstruction after primary bone tumors resection with a 5-year-minimum follow-up: A national multicentric study about 154 patients.

Abstract ID : 1049
Submitted by : Jean-Camille MATTEI the 2015-12-31 10:49:28
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION
The reconstruction of distal femur after bon tumor resection requires massive prostheses. Modularity has allowed much more reactivity in the process and the major part of available large studies refers to prostheses no longer produced. Others are heterogeneous, mixing distal femur with proximal tibia, primary with secondary bone tumors, first resection with revision, tumoral with non tumoral etiologies and different brand of prostheses. The aim of this retrospective study was to establish a basis of survival and complication rates with functional results of a homogeneous series of one brand of prosthesis, still produced and only used for the first surgery of distal femur primary bone tumors.

MATERIAL AND METHODS
All the patients from the 4 French reference centers, treated with a massive modular prosthesis Stanmore Mets® for distal femoral reconstruction were included from 2004 to 2010, to allow a minimum significant 5 year follow up. The analysis included a functional TESS score evaluation form, physical and radiological examination, classical epidemiological data recording, complications analysis, survival curves with failure risk factors tests and evaluation of the 5 possible failure modes according to the Henderson classification.

RESULTS
154 patients (80 men and 74 women) of 40.8 year old were included. Chondrosarcoma and Osteosarcoma accounted for 77% of all cases. On latest follow up, 104 were disease free, one alive with metastasis, 40 were deceased of disease and 6 were deceased because of other pathologies. 3 were lost of sight.
Major part of complications was infectious (44 reoperations, versus 24 for mechanical reasons and 10 because of tumoral progression).
Overall failure rate was 18%. Survival rates were of 82% and 76% at 5 and 10 years. Type 2 failure was recorded in 8 cases (5%), Type 3 in 6 cases (4%), Type 4 in 9 cases (6%) and Type 5 in 5 cases (3%). There was no Type1 failure. Over 28 revisions, 5 ended up with amputation or total femur prosthesis (18% failure rate). Mean TESS functional score was of 82%.

DISCUSSION
These results are consistent with the few large series of the literature. However modular, the prosthetic fracture rate is very low (1 case) and aseptic loosening remains a rare complication, maybe thanks to hydroxy-apatite collar or long stems with large endosteal support. As scheduled, infection rate is high (29%). Focus on this issue is permanent in bone tumor societies and one effective solution could be the use of silver-coated prostheses.
The retrospective design and population heterogeneity, classical issues in bone tumor surgery literature, are the main limits of this study, which however remains one of the most homogeneous to date.

CONCLUSION
The 5-year-minimum results with this modular prosthesis are satisfying regarding survival and revision rates. There are still progresses to perform, essentially through large international cooperation in oncologic orthopaedics to gather information consistent enough to gain statistical power, which this study lacked at some points to evaluate some variables implication. The follow up of this cohort will continue to determine a 10-year follow up.

Keywords : Survival, Results, Endoprosthetic, Primary bone tumor, Distal femur
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Clinical and radiological outcome of the abductor system repair with association of a trochanteric Hydroxyapatite plate and a modular prosthesis for proximal femur tumour resections

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Submitted by : Vincent CRENN the 2016-01-14 13:47:49
Category : Others
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Status : Validated
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Introduction
Proximal femur reconstruction after tumor resection may be performed either by sleeved prosthesis in bone allograft or massive prosthesis. Our aim was to evaluate the effectiveness of the abductor system repair using a screwed trochanteric plate coated with Hydroxyapatite associated to the STANMORE METS Modular Prosthesis.

Patients and Method
31 patients operated in two tumor reference centres between 2006 and 2015 were included at a mean 26 months (6-103) follow-up. All patients beneficiated from a proximal femur resection with a massive prosthesis reconstruction for tumor associated to a trochanteric screwed abductor system repair. The primary endpoint of the study was an isometric torque measurement of hip abduction. Secondary endpoints were clinical, functional scores, and isometric torque measurements in other hip mobility sectors. Trochanteric bone medallion and prosthesis stability were also evaluated.

Results
Abduction strength conservation was 55.2±23.3% compared to contralateral side. Digastric reinsertion with bone medallion and use of a standard offset model significantly increased abduction strength. When these three criteria were gathered, abduction strength conservation was 76.7±7.8%. Digastricus reinsertion had a significant relationship with radiographic bone medallion stability.

Conclusion
Results in terms of strength conservation in case of digastricus reinsertion with bone medallion for STANMORE METS modular prosthesis are satisfactory with three quarters force conservation in abduction. Priority should be also given in this context to an over-recovery of the femoral offset. A longer-term assessment would be desirable to assess strength conservation evolution and bone medallion stability.

Keywords : Tumor of the proximal femur, Modular prosthesis, Abductor system, Digastric reinsertion, Femoral offset
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Very Long Term Outcomes Following Endoprosthetic Replacements

Abstract ID : 1089
Submitted by : Robert Grimer the 2016-01-25 18:02:48
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Limb salvage surgery had replaced amputation as the preferred treatment modality in more than 90% of the patients with extremity sarcomas. Endoprosthetic reconstruction has the advantage of providing immediate stability, thus allowing early mobilization, rehabilitation, and weight bearing. However, the long term results of these megaprostheses are still lacking.
Aim: To establish what happens to patients in the long term (>25 yrs) following endoprosthetic replacement. All patients in this series had first generation prosthesis (e.g. at the knee a cemented, fixed hinge).
Methods: A prospective database contains details of all patients treated at our unit with musculoskeletal tumours. All patients who underwent an endoprosthetic replacement more than 25 years ago (prior to 31/5/1990) and who were still alive at 20 years were identified and their outcomes investigated with particular reference to the development of complications and the need for further surgery. 229 patients who had complete follow up and were alive at 31/5/2015 were identified. The mean age at diagnosis was 20.8 years (range, 5-62 years). The most common diagnoses were osteosarcoma (132) followed by Ewing's sarcoma (31) and chondrosarcoma (23). There were 101 distal femoral, 59 proximal tibial, 26 proximal femoral, 20 proximal humeral, 8 intercalary, 5 total femoral, 5 total humeral, 4 hemipelvic, and 1 distal humeral endoprosthetic replacements.
Results: All patients were followed up for a mean period of 28.8 years (range, 25 to 43 years). The 229 patients had a total of 653 further operations (excluding lengthening of expandable prostheses and rebushing). This averaged 2.9 further operations per patient over a minimum of 25 yrs. The risk of amputation was 16% at 30 years. Those without infection had a mean of 2.1 further operations whilst those with infection had 4.6 further operations. 38 patients (17%) still had the original prosthesis in situ after more than 25 years. 34 patients required an amputation, one for vascular problems, 22 due to infection and 10 due to local recurrence. Only one patient had an above knee amputation for fixed flexion deformity of the knee while none of the amputations were done purely for mechanical failure.
The risk of infection persisted throughout the life of the prosthesis and averaged about 1% per year. Of the 65 patients who developed an infection, only 11 developed it within 6 months of a previous surgery – suggesting that the risk of infection following any further surgery was around 2%. The biggest risk sites for infection were the proximal tibia (49%), proximal femur (26.9%) and the distal femur (24.7%) and for amputation were the proximal tibia (26.7%) and the proximal femur (15.4%). 26 of the 65 (47%) eventually had an amputation.
Conclusions: This study represents the longest and most detailed follow up of patients with 'first generation' endoprostheses. It shows that further surgery is almost inevitable as patients live longer but in the majority limb salvage is maintained. Late complications continue to arise however with infection being the most devastating.

Keywords : Endoprosthesis, long term follow up
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Retrospective evaluation of silver coated tumour prostheses in complex joint infection with major bone destruction: about 23 cases with 43 months follow up

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Submitted by : Fabrice Fiorenza the 2016-02-21 22:34:18
Category : Others
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction: Complex joint infections around the hip or the knee often require an aggressive surgical debridement that can sometimes lead to major bone loss. Bone reconstruction can be difficult in such cases and the use of a silver coated tumour prosthesis is an interesting option. The aim of this paper is to report the experience of 2 reference centres with silver coated tumour prostheses used in infected patients.
Materials and Methods: It is a retrospective study. Patients were included in 2 university teaching hospital (CHU of Tours and CHU of Limoges) over a period of about 9 years.
Results: Our series included 23 patients with complex infected prostheses: there were 15 men and 8 women. Mean age was 65.3 (29-82). There were 10 proximal femur prostheses, 5 distal femur prostheses, 2 knee arthrodesis prostheses, 4 total femur prostheses, 1 ice cream cone prosthesis and 1 patient had a bipolar reconstruction using an ice cream cone and a proximal femur endoprosthesis. There were 18 Mutars® prostheses (ImplantCast, Germany) and 5 Stanmore® prostheses (SIW, UK). Mean follow-up was 43 months (8-120). On average each patient had 1.9 germ (1-10). 55% of the germs were Staphylococcus spp (Staphylococcus aureus: 27,5 %, coagulase negative Staphylococcus: 27,5%). On average each patient had 5.3 operations (3-10) before the final silver coated prosthesis was implanted. Two patients had acute local recurrence of the infection at 45 and 60 days and 2 patients developed late local recurrence of the infection at 1 and 2 years. One patient had a new infection with a different organism (Candida glabrata). Each case was discussed with a multidisciplinary team and treatment included systemic antibiotics with a 2 stage revision surgery for 22 patients and 1 stage revision surgery for one patient.
Discussion: Reconstruction using tumour implants is a satisfactory method in case of a huge bone defect. The use of silver coated implants appears to reduce the rate of infection after 2 stage revision surgery1,2.
Conclusion: The overall success rate in controlling infection with this treatment strategy using silver coated implants and systemic antibiotics was 82.6% at 43 months in this short series. The authors recommend the use of silver coated implants in complex joint infection with major bone destruction

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2- Wafa et al : Bone Joint J 2015;97-B: 252–7.

Keywords : Tumour prostheses, silver,complex osteoarticular infection
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Ukrainian Custom-made Tumor Prosthesis System (SIMEKS) for Limb Reconstructions: 12 years follow up

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Submitted by : Oleg Vyrva the 2016-02-21 22:53:57
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective:of this study was to report the 12 years clinical experience of the Sytenko Institute with the use of Ukrainian custom-made reconstructive tumor prosthesis for the extremities (SIMEKS). This system was introduced for limbs reconstructions by Inmaisters, Ukraine in 2002. It was designed to for reconstruction of bone and joints defects lower and upper limbs. The authors present a review of 208 consecutive cases of prosthetic reconstruction performed during the last 12 years with the new modular system.
Materials and Methods:between March 2003 and December 2013, 208 patients underwent prosthetic reconstruction of the limbs with the Ukrainian custom-made system SIMEKS. There were 110 males and 98 females with average age of 42,1± 16,81 years (9-70). The diagnosis was a primary malignant bone tumor in 170 cases, bone metastases were in 38 cases. In 39 cases the prosthesis were implanted as revision of a failed prosthesis. For lower limb a proximal femur replacement was done for 39 patients, a distal femur for 64, a total femur for 4, a femur intercalary for 5, a proximal tibia for 35 and a distal tibia for 8 patients. For upper limb a proximal humerus replacement was done in 26 cases, distal humerus replacement in 6, a total humerus replacement in 5, a total elbow replacement in 3, proximal ulna replacement in 2, proximal radius replacement in 1 and a distal radius replacement in 10 cases. All patients are periodically checked in the outpatient clinic. Complications were reported and analyzed, X-ray and CT were reviewed and pertinent information achieved for each patient. Functional results were assessed according to the MSTS score.
Results:46 major complications were observed in 38 patients. The most frequent complication was infection of the implant which occurred in 19 cases (13,1%). The mechanical failure of the morse taper of the prosthetic body occurred in 12 cases (8,3%) requiring a surgical revision and component replacement preserving the stem in place. Aseptic loosening was seen in 7 cases (4,8%). The functional results were evaluated at average 6,2 ± 1,4 period (from 12 to 1 years follow up). At final follow up 88% of the evaluable patients presented a satisfactory functional result (excellent or good following MSTS score) 74,6 ± 17,0 % for the lower limb and 67,6 ± 9,0 % for the upper limb.
Conclusions:the new Ukrainian custom-made tumor prosthesis system for limbs may be successfully employed for prosthetic reconstruction. This system is chipper then analogs and has individual advantages for Ukrainian patient population. The preliminary data of the presented series of patients showed good functional results which need to be confirmed by a long term follow up and bigger number of surgeries. This system seems definitely promising and reviewed design and material justifyits use in primary tumor replacements and complex revision of prosthetic failures with massive bone loss.

Keywords : customised tumor prostheses system, follow up
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Functional outcomes and complications after total scapulectomy: is massive reconstruction worthwhile?

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Submitted by : Susanna Maraldi the 2016-02-22 23:53:17
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
The shoulder girdle is a common site for malignant neoplasms. Limb salvage surgery is possible in vast majority of patients and en-bloc tumor excision by total scapulectomy +/- proximal humerus resection represents the treatment of choice. The role of reconstructive surgery in this setting remains unclear as several procedures have been described to maximize residual function. While humeral suspension to residual clavicle and/or chest wall has been historically used, formal massive reconstruction by either endoprosthetic replacement or osteoarticular allograft has been more recently reported as possibly associated with superior function. Nevertheless, comparative data correlating surgery and functional outcome are lacking. In particular, questions of this study were:
1) Shoulder function following scapulectomy and its variants, with and without reconstruction;
2) Complications associated with the index procedure, with and without reconstruction;
3) Postoperative and long term pain, possibly associated with downwards migration of the arm.

Patients and Methods
A retrospective analysis of 56 patients who underwent total scapulectomy for different malignant neoplasms between 1995 and 2013 was performed. The mean age was 51 years (range 2-90). The average time of follow-up was 38 months (range 0-189). 34 patients died of disease, 22 were still alive at the latest follow-up examination and 12 of these had no evidence of disease. Diagnoses included chondrosarcoma in 9 patients, Ewing's sarcoma in 12, osteosarcoma in 13, soft tissue sarcoma in 8, metastatic disease in 12, and desmoid tumor in 2. En-bloc excision of the scapula was performed in all cases; a negative margin was obtained in 54 patients while 2 patients had a positive margin. Twelve patients had a local recurrence (10 after a wide resection, and 2 after a marginal resection). In 37 patients, an intra-articular total scapulectomy (Malawer type III) was followed respectively by biologic reconstruction with massive allograft (22), humeral suspension to residual clavicle and/or chest wall (9) or scapular endoprosthesis (6); in 19 patients, following an extra-articular total scapulectomy (Malawer type IV) shoulder reconstruction was performed by endoprosthetic replacement of the scapula and proximal humerus.

Results
At latest follow-up the Musculo-Skeletal Tumor Society (MSTS) score was assessed. Patients with endoprosthetic replacement of the scapula (Malawer III) and of the scapula and proximal humerus (Malawer IV) had a mean MSTS score of 21 and 18 respectively; for patients with a Malawer III excision, mean MSTS score was 22 for allograft reconstruction and 19 for humeral suspension. Additional surgery due to postoperative complications was required in 9 patients after massive reconstruction (infection 6, dislocation 1, prominence of the allograft 2), leading to implant removal in 5 patients, while there were 3 infections in patients with humeral suspension.

Conclusions
Although there was no definitive statistical difference, a trend towards superior outcome of massive reconstruction when compared to humeral suspension was noted. Postoperative complications may negatively affect outcome and lead to implant removal, having a worse impact on outcome of patients with a massive reconstruction.

Keywords : scapulectomy, bone tumor, allograft, endoprosthesis
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Acetabular reconstruction using Trabecular Metal in orthopaedic oncology. A solution for complex cases?

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Submitted by : Michele Boffano the 2016-02-07 02:28:28
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction Trabecular Metal (TM) has been widely used in joint arthroplasty with good long-term functional results. Metastatic and linfoprolipherative lesions in the acetabulum can usually be considered as IIIA-B defects according to Paprosky's classification. The surgical management is always challenging and a conventional acetabular cup may not be adequate. The main objective of pelvic reconstructive surgery is to obtain a stable and durable implant, and not affected by a possible local radiotherapy. The aim of the study is to evaluate the reliability of modular TM acetabular implants in orthopaedic oncology and their complication rate
Methods In an Italian reference centre for Bone and soft tissue tumours 7 patients were surgically treated for acetabular reconstruction with modular TM in the period 2013-2014. The diagnosis was breast carcinoma metastases (2), prostate adenocarcinoma metastases (1), multiple myeloma (1), chondrosarcoma (1), soft tissue sarcomas of the groin with hip joint invasion (2). Age range 41-74, mean age 61. Five patients received radiotherapy (4 postoperatively, 1 preoperatively). All the patients except the one with chondrosarcoma had chemotherapy before and/or after surgery. According to Paprosky's classification the defect was IIIA (3 cases) or IIIB (4). Furthermore in one patient with chondroblastic osteosarcoma (18 ys), the left hemipelvis was reconstructed with a custom-made endoprosthesis with TM onto the bone-contact surfaces. Minimum follow up 12 months (maximum 36 months). Function was evaluated according to MSTS score. Complications (loosening, infection, local progression of disease, dislocation) were evaluated.
Results: One patients died for lung metastases 3 months after surgery. The other 6 cases were evaluated for function and potential complications. The mean MSTS score was 30 at 1 year (range 25-33). We observed 2 complications: 1 local progression of disease and 1 dislocation. The dislocation was managed incruently. The local progression was manged revising the implant (intrinsically stable) with a flanged ring cup. No infection or intrinsic loosening of the modular implants were observed. Full weightbearing with cane or crutches was obtained at a maximum of 3 months. The hemipelvis case walked unaided after 6 months, has an excellent local function but a lung progression of disease.
Conclusions: Modular TM implant is one of the options for the reconstruction of acetabular bone defects in orthopaedic oncology. The main advantages are the adaptability to different clinical situations and the "off-the-shelf" availability. Even if no direct complications of radiotherapy have been observed in the short period a longer follow up is needed to look for potential delayed effects. Biomechanical studies on the stability of the interface Trabecular Metal-cement are ongoing.

Keywords : acetabulum, pelvic tumours, hip reconstruction, trabecular metal
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The Pararectus Approach – A Versatile Option In Pelvic Musculoskeletal Tumor Surgery

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Submitted by : Christophe Kurze the 2016-02-14 18:29:50
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction
Pelvic tumor surgery is one of the most complex fields in musculoskeletal oncology. Surgical treatment of pelvic bone and soft tissue tumors is associated with a high risk of complications. The utilitarian pelvic incision, an extended ilioinguinal/iliofemoral approach has been well established to address pelvic tumors. However, as an extrapelvic approach it offers limited access to the intrapelvic neurovascular structures. The pararectus approach, an intrapelvic anatomical approach with extraperitoneal access to the pelvis has been established previously for the treatment of pelvic and acetabular fractures. The approach avoids the medial flank of the utilitarian approach and can be extended distally and intraperitoneally.
The study aimed at investigating the feasibility of this approach for pelvic tumor surgery and the possibilities of combining this approach with standard approaches to the hip joint.

Methods
10 patients (6 male/4 female) with a mean-age of 53,9 ± 18,7 years that underwent musculoskeletal tumor surgery of the pelvis between 2010 and 2015 were retrospectively reviewed. 6 patients were treated for a malignant tumor (Chondrosarcoma n=2, high-grade sarcoma/NOS n=2, myxofibrosarcoma n=1, malignant fibrous tumor n=1). 4 patients were treated for a benign (lipoma n=3) or a locally aggressive tumor (desmoplastic fibroma n=1). Tumor resections were performed via the pararectus (n=3) or extended pararectus approach (n=2). In 5 cases, the pararectus approach was combined with extrapelvic approaches including the Kocher-Langenbeck- (n=1), trochanteric flip (n=1), and modified Gibson approach (n=3). The minimum follow-up was 3 months. The mean follow-up was 10,9 ± 8,3 months (3-30 months). The successful execution of the planned resection served as the primary outcome parameter. Secondary outcome parameters were major and minor complications, blood loss and duration of the intervention. Major complications were defined as complications requiring surgical intervention.

Results
In all cases the tumor resections were carried out according to the preoperative plan. In 5/10 cases R0 resections were performed; 5/10 cases were planned R1 resections. Blood loss was 3431 ± 5392 ml. Mean duration of the surgeries was 5.8 ± 4.3 hours. 4 major complications were observed in 2 cases (vascular injury requiring mass transfusion n=1, deep infection n=2, iliac vein thrombosis n=1, total hip arthroplasty dislocation n=1). All major complications were unrelated to the approach and were controlled with the same or repeat surgical intervention. 3 minor complications (scar hernia n=1, intraoperative-transfusion n=4, meralgia paraesthetica n=1) were observed in 4 cases.

Conclusions
Pelvic tumor surgery remains challenging due to the complex three-dimensional anatomy and the proximity to vital neurovascular structures. The present study showed the pararectus approach achieved good exposure of the hemipelvis and intrapelvic neurovascular structures. Furthermore, distal extension towards the anterior and the adductor compartment to address extrapelvic tumor growth proved to be uncomplicated. The possibility to combine the approach with standard approaches to the hip joint allowed for single-stage reconstructions of the pelvis and the hip joint without sacrificing surgical margins and function. The pararectus approach is a versatile option adding to the established approaches for musculoskeletal tumor surgery of the pelvis.

Keywords : Musculoskeletal Tumor, Surgery, Pelvis, Pararectus Approach, Sarcoma
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SESSION 3
PELVIC TUMOURS

Prognosis after recurrence of pelvic osteosarcoma: Results obtained for 31 patients from the EURopean RELapsed OSteosarcoma registry EURELOS

Abstract ID : 1159
Submitted by : Stefan Bielack the 2016-02-08 18:58:28
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Pelvic osteosarcomas carry a high risk of local or systemic failure, but little is known about prognostic factors following a 1st recurrence after multimodal treatment.

Patients and methods: EURELOS, a collaborative prospective EMSOS project of osteosarcoma recurrences arising after a first surgical remission which registers patients from the Cooperative Osteosarcoma Study Group COSS and the Italian and Scandinavian Sarcoma Groups ISG and SSG, was searched for evaluable patients who had originally had a pelvic primary. Patient, tumor, and treatment related factors were analyzed for potential correlations with outcome.

Results: 31 patients (COSS n=26, SSG n=3, ISG n=2) with metastatic (n=17), local (n=7), or combined (7) recurrences of pelvic osteosarcoma occurring a median of 1.8 years (range: 0.3-14.4) from initial diagnosis were identified. After a median follow-up (MFU) of 1.30 years from 1st recurrence (range: 0.07-6.37), 11 patients were alive (MFU 2.31 years, range: 0.64-6.37; n=3 in 2nd , n=1 in 3rd complete remission, 7 with disease), while 20 patients had died after a median of 1.20 years (range: 0.77-6.06). 2 and 5 year overall survival estimates were 0.453 (standard error SE: 0.097) and 0.233 (SE: 0.094), respectively. A longer interval to recurrence (p=0.003, log-rank) and metastases only compared to local or combined recurrences (p=0.032) predicted for better survival. No patient survived beyond 2 years without surgery of the recurrence. All 4 patients who remained alive beyond 3 years at time of data capture had experienced late metastatic recurrences which were operated upon.

Conclusion: This largest series of recurrences after pelvic osteosarcoma confirms that outcomes are poor. An early recurrence and involvement of the former primary tumor site herald a particularly poor prognosis. Selected patients may achieve long-term survival with appropriate surgery, particularly if their recurrences arise late and are exclusively metastatic.

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Keywords : osteosarcoma, pelvis, recurrence, prognosis
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Reconstruction of Periacetabular Tumors With the Ice Cream Cone Prosthesis: What Are the Short-term Clinical and Functional Results?

Abstract ID : 1165
Submitted by : IRENE BARRIENTOS-RUIZ the 2016-02-09 11:34:22
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background. The reconstruction after the internal hemipelvectomy resection must provide better function than the hindquarter amputation. The reconstruction methods that have been used have a high rate of complications and the function is usually poor. The periacetabular area has special reconstruction challenges and many devices are investigated.
Questions/purposes: The purposes of this study were to describe the surgical site postoperative complications associated with the use of the Ice-Cream Cone prosthesis for reconstruction of the periacetabular zone; We evaluate the Musculoskeletal Tumor Society (MSTS) outcomes scores in a group of patients treated with this implant in the short term (2 years); we quantified the local recurrence and its relation with the surgical margins in this group of patients.
Methods: Between 2008-2013, one center performed a total of 27 internal hemipelvectomies for oncological indications. Of those, 14 were patients with periacetabular area involvement, without an affected iliac wing and a general condition that could balance the risk of complications of the implant. These 14 patients underwent reconstruction with an Ice-Cream cone-style implant (CONED®; STANMORE WORLDWIDE LTD, Elstree, UK and SOCINCER® CUSTOM MADE IMPLANT FOR PELVIS; Gijón, Spain), while 9 others were treated with other implants or allograft. Of those, 10 (71,42%) were available for follow up at a minimum of 2 years (median, 3,14 years; range 2 to 4,5 years), unless a study endpoint (wound complication, infection, or local recurrence) was observed earlier.
Results: Local wound complication occurred in 5 of the 10 of the patients and 2 developed deep infection. However, none of them had to be removed. Median MSTS score was 19.3/30. 5 out of 7 primary tumors had wide margin surgery and 3/7 developed local recurrences at the end of the follow up.
Conclusions Pelvic reconstruction with the Ice-Cream Cone prosthesis yielded fair functional results at short-term followup. Longer-term studies is called for to see whether this implant will represent an improvement over available reconstructive alternatives such as allograft, Custom made, and saddle prosthesis. We are cautiously optimistic and continue to use this implant in patients with involvement of the periacetabular area.
Level of Evidence: Level IV, therapeutic study.

Keywords : Hemipelvectomy, cone prosthesis, sarcoma
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LUMIC endoprosthetic reconstruction in complex acetabular bone defects : multicentric study and preliminary results, the French experience.

Abstract ID : 1222
Submitted by : Fabrice Fiorenza the 2016-02-12 02:03:21
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Reconstruction of the pelvis after hemipelvectomy for bone tumours or after bone loss because of metastatic disease or complex revision surgery is among the most challeng-ing procedures in orthopaedic surgery. Complications remain high and difficult to man-age. The aim of this retrospective study was to evaluate the outcome and the early re-sults of the LUMIC prosthesis among 10 centres in France.
Material and methods : Between Novembre 2011 and March 2015, 34 prostheses were implanted in France. 29 patients were reviewed with a minimum follow up of 6 months. There were 20 males and 9 females. Mean follow up was 20 months (6-50). Indications were : resection of primary malignant bone tumours (19), metastatic disease (4), complex hip revision surgery (6). There were 16 chondrosarcomas, 1 Ewing sar-coma, 1 lymphoma and 1 myeloma.
Results : There were 25 uncemented prostheses(86%), 25 dual mobility cups (86%). On the femoral side, there were 8 uncemented revision stems, 8 cemented tumour prosthe-ses, 6 uncemented and 7 cemented conventional stems. Resection margins were R0 (15 patients), R0 contaminated (1 patient), R1 (3 patients). At the last follow up, 89 % (17/19) of patients with a primary malignant bone tumours were alive: 13 without dis-ease (68%), 2 with local recurrence (11%) and 2 with chest metastasis (11%). Compli-cations included 21% of dislocations (6/28), 10% (3/28) of aseptic loosening with stem migration leading to removal of the implant (one patient had post op radiotherapy with no integration of the stem and subsequently loosening of the implant, 2 patients had a P1P2 resection with migration of the stem due to insufficient bone stock), and 5 acute infections (17%) which were managed with a DAIR procedure.
Discussion : the rate of complications is high but compares with previous studies pub-lished in the literature.
Conclusion : These early results show that the Lumic prosthesis is reliable in adequate indications (P2 resection) or when used in complexe THA revision with important bone loss. The authors do not recommend this type of implant in P2 + P1 resection: lack of bone around the stem or malposition of the stem in the sacrum lead to high risk of mi-gration of the stem and high risk of dislocation (classical and intra-prosthetic type for dual mobility cups).

Keywords : acetabular reconstruction,pelvic resection,pelvic prosthesis
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Functional Outcome Following Total Sacrectomies without Spino-pelvic Reconstruction

Abstract ID : 1223
Submitted by : Piya Kiatisevi the 2016-02-12 06:57:45
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives
After total sacrectomy, many types of spinopelvic reconstruction have been described with good functional results. However, complications associated with reconstruction are not uncommon and usually result in further surgical interventions. Moreover, less is known about patient function after total sacrectomy without spinopelvic reconstruction, which may be indicated when malignant or aggressive benign bone and soft tissue tumors involved the entire sacrum We would like to report functional outcome and ambulatory status of patients after total sacrectomy without spinopelvic reconstruction especially when categorized by the location of the iliosacral resection relative to the sacroiliac joint?

Methods
Between 2008 and 2014, we performed 16 total sacrectomies without spinopelvic reconstructions for nonmetastatic oncologic indications. The average age of the patient was 60 years (range, 14-83 years). All surviving patients had followup of at least 12 months, although two were lost to followup after that point (mean, 43 months range, 12–66 months, among surviving patients). The level of resection was L5-S1 disc in 14 patients and L4-L5 disc in 2 patients. We classified the resection into two types based on the location of the iliosacral resection. Type I resections went medial to or through or lateral but close to the sacroiliac joint. Type II resections were far lateral (more than 3 cm from the posterior iliac spine) to the sacroiliac joint. The Musculoskeletal Tumor Society (MSTS) scores, physical function assessments, and complications were collected. Video documentation of patients walking was obtained at followup in eight patients.

Results
The mean overall MSTS scores was 17 (range, 5–27). Thirteen patients were able to walk, four without walking aids, three with a cane and sometimes without a walking aid, three with a cane, and three with a walker. Thirteen of 14 patients who had bilateral Type I resections or a Type I resection on one side and Type II on the contralateral side were able to walk and had a mean MSTS score of 19 (range, 13–27). The median time for patients to start walking was 4 months (range, 3-12 months). Two patients with bilateral Type II resection were only able to sit. Complications included wound dehiscences in 13 patients (which were treated with reoperation for drainage), sciatic nerve injury in seven patients, a torn ureter in one patient, and a rectal tear in one patient. Radiographic findings in these patients revealed spinal column sank down and fusion between transverse processes and iliums or the remaining lateral sacrum around the sacroiliac joints. At last follow-up, 12 patients were incontinent and 4 were incontinent under stress.

Conclusion
Without spinopelvic reconstruction, most patients who underwent total sacrectomy were able to walk. Good MSTS scores could be expected in patients with bilateral Type I resections and patients. With an acceptable MSTS score and no reconstruction-related complication, this method should be consider as an option following total sacrectomy with at least one side of type I iliosacral resection .

Keywords : total sacrectomy, without reconstruction
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Surgical options for the patients with metastatic acetabular tumor

Abstract ID : 1260
Submitted by : wei guo the 2016-02-14 03:19:22
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: To identify the indication of surgery for periacetabular metastases and to determine the impact of the novel surgical option for Harrington type III lesion on function and local recurrence. Materials and Methods: 120 patients with periacetabular metastatic tumors underwent surgical treatment between Jun 2003 and Jun 2015. The series included 57 female patients and 63 male patients, with an average of 54.7 years (20-76 years). According to Enneking and Harrington's classification, we decided the protocol of resection and reconstruction of pelvic tumors for these patients. For patients with Harrington Type III lesions, we performed 2 different types of surgery : a) intralesional excision followed by Steinmann Pin and bone cement acetabuloplasty and total hip arthroplasty(type IIIa surgery) and b) en bloc resection followed by modular hemipelvic endoprosthesis replacement(type IIIb surgery). Based on the routine surgical indications described by Harrington for type III lesions, the indications for type IIIb surgery also included massive bone defect and/or large soft tissue mass. Results: The acetabula were reconstructed in 120 patients. There was no patient with Harrington Type I lesion in the series; 52 patients with Type II lesions underwent type II surgery; 15 patients with Type III lesions underwent type IIIa surgery; 22 patients with Type III lesions underwent type IIIb surgery and 31 patients with Type IV lesions underwent type IIIb surgery. Median follow up time was 11 months (1-66 months). The average post-operative MSTS93 score was 18.7. Among patients with type III lesions, in 15 patients received type IIIa surgery and 22 patients received type IIIb surgery, the average post-operative MSTS93 score was 17.4 and 18.2 respectively, , which showed no statistical difference(P=0.72). The average and median post-operative overall survival time was 23.8±2.3 and 16 months, respectively. Recurrence was found in 18 patients (15.0%) and the average recurrence-free survival time was 50.6±2.4 months. For patients with type III lesions, the recurrence-free survival of patients received type IIIb surgery was significantly better than that of patients received type IIIa surgery(P=0.02). Conclusion: The indication of surgical intervention for periacetabular metastasis is severe pain and difficulty in ambulation caused by metastatic lesions. For patients with Harrington Type III metastatic lesion, because of the better functional outcome and lower local recurrence incidence, type IIIb surgery was more recommended than type IIIa surgery on lesion with massive bone defect and/or large soft tissue mass.

Keywords : Surgery, Pelvis, Neoplasm, Metastasis
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Pelvic Osteosarcoma – are there patterns leading to long-term survival or death sentence? A retrospective analysis of 67 patients treated at a mean follow-up of 89.5 months

Abstract ID : 1279
Submitted by : Wiebke Guder the 2016-02-14 14:39:07
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Osteosarcoma of the pelvis is a rare condition compared to its incidence in other localizations. Existing literature reports inferior outcomes for pelvic osteosarcomas (i.e. local recurrence rate, survival) compared to the overall outcome of osteosarcomas treated.
To review the surgical and oncological outcomes of patients treated in a single institution, we performed a retrospective analysis of sixty-seven patients treated for pelvic osteosarcoma from 1998 until 2014.
Mean patient age at diagnosis was 32.7 years (range 11-70). Thirty-nine (58.2%) patients were male and twenty-eight (41,8%) patients female. Sixty-five (97%) patients had high-grade tumors. Fifty patients (74,6%) were treated for primary osteosarcoma and nine patients (13,4%) for pelvic osteosarcoma metastases. Secondary osteosarcomas occurred in six patients (8,9%). One osteosarcoma in a Morbus Paget patient and one low-grade osteosarcoma were treated (1,5% each). Tumor size was above 10 cm in the largest diameter in 70.9% (n=39) of cases. Internal hemipelvectomy was performed in 54 cases (80,6%) (intraarticular n=24 (44,4%), extraarticular n=23 (42,6%), other n=7 (13%)). Thirteen patients (19,4%) underwent hindquarter amputation, eleven of them for osteosarcoma recurrences or after intralesional primary operations. Secondary external hemipelvectomy after failed internal hemipelvectomy were performed in four cases. Hip transposition was the most frequently used reconstruction technique (n=45; 67,2%)). Other reconstruction techniques in decreasing order were none (n=13; 19,4%), composite osteosynthetic reconstructions (n=4; 6%), biological reconstructions using autologous fibula transplants (n=2; 3%) and tibia allograft (n=1; 1,5%). Two patients (1,5% each) had reconstructions using pelvic implants. One patient (1,5%) received a stump lengthening procedure after external hemipelvectomy. Twenty patients received megaendoprosthetic implants and two patients total hip replacement implants after extraarticular internal hemipelvectomy. Mean duration of operation was 285.9 minutes. Wound healing disorders occurred in 50.7% of patients (n=34), necessitating revision operations in thirty-three cases. Tumor margins were clear in 96,9% of cases. Twenty-one patients had primary pulmonary or other metastases at the time of operation. Fourteen patients developed metastases after a mean time of 20.5 months after operation. Local recurrences occurred in 17.9% (n=12 cases). Twenty-nine patients died of disease (43.28%), thirty patients are alive with no evidence of disease (44.77%), two patients are lost to follow-up (2.9%) and follow-up is still pending in six patients (8.9%). The mean follow-up is 89.5 months (range 15-197 months).
As reported in literature, our study shows that the overall prognosis of pelvic osteosarcoma is still inferior compared to that of osteosarcoma of the limbs. Possible causes leading to worse survival and increased local recurrence rates might be larger tumor sizes, closer resection margins and undetected cases of tumor thrombi in tumor feeding vessels. Also, higher rates of wound healing disorders with necessity to postpone the continuation of chemotherapy might lead to an increased risk of metastatic tumor growth. However, these suspects are difficult to analyze statistically due to the small numbers of treated patients in a single institution analysis.

Keywords : pelvis, osteosarcoma, surgical outcome, oncological outcome
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Is computer navigation of pelvic tumours safer for the patient?

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Submitted by : Michael Parry the 2016-02-14 16:36:48
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Due to the complex anatomy of the pelvis, limb-sparing resections of pelvic tumours achieving adequate surgical margins, can often be difficult. The advent of computer navigation has improved the precision of surgical resections of the pelvis, though little evidence exists comparing resection with or without the assistance of navigation. The aim of this study was therefore to assess the accuracy of navigation assisted surgery, as defined by the margin achieved at resection, and how this affected local control, to assess any differences in overall survival that may exist when compared to non-assisted surgery, and to identify any benefit to the patient in terms of peri and post operative morbidity through the use of navigation.
Materials and Methods: Using our prospectively updated institutional database, we conducted a retrospective case control study of 21 patients who underwent a resection of the ilium and sacrum, for treatment of a primary sarcoma of bone, between 1987 and 2015. In 9 patients resection was performed with the assistance of navigation and in 12 without navigation. We assessed the accuracy of navigation-assisted surgery, as defined by the margin and how this affects local control, disease specific survival and the possible benefit in terms of peri-and postoperative morbidity.
Results: The mean age was 36.4 years. The mean tumour size was 10.9 cm. In the navigation-assisted group, the margin was wide in 2 patients (16.7%), marginal in 6 patients (66.7%), wide-contaminated in 1 (11.1%) with no intralesional margin. In the non-navigated-assisted group; the margin was wide in 2 patients (16.7%), marginal in 5 patients (41.7%), intralesional in 3 patients (25.0%) and wide-contaminated in 2 patients (16.7%). Local recurrence occurred in 2 patients in the navigation-assisted group (22.2%) and 6 in the non-navigation assisted group (50.0%). In the navigation-assisted group, the 5-year disease-specific survival was 100% and in non-navigation assisted group 52.9% (p=0.061). Estimated blood loss and operating time were less in navigated-assisted group as was the risk for unplanned foot drop.
Conclusion: The beneficial effects of navigation when applied to tumour resection of the posterior ilium and sacrum, on reducing surgical time and intraoperative blood loss, as well as the more accurate placement of osteotomies with reduction in intralesional margins and fewer local recurrences as well as fewer complications, is clearly an advantage.

Keywords : Pelvis, Sarcoma, Navigation
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Acetabular resection and reconstructions in children and adolescent in pelvic bone tumours: results of zone II reconstructions

Abstract ID : 1307
Submitted by : Eric MASCARD the 2016-02-14 22:23:06
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Acetabular reconstructions have many complications leading some to leave the hip unreconstructed or perform hip transposition in complex type II pelvic resections. The purpose of our study was to report the results of acetabular resection in children with reconstruction of the hip

From 1991 to 2013, 39 patients underwent a complete acetabular resection for a pelvic bone tumour in two institutions. There were 23 males and 16 females aged 4 to 19 (mean 11,6). Histology were 25 Ewing, 11 osteosarcomas, 2 chondrosarcomas and one spindle cell sarcoma. In 14 patients a type II +III resection was performed, in 14 a type I+II, in 7 a type I+II+IV and in 4 a type I+II+III. Reconstruction was achieved by hip arthrodesis or intended pseudarthrosis in 13 cases, an osteoarticular pelvic allograft in 7, total hip replacement (THR) with pelvic allograft in 5 cases, THR in a distal femur allograft in 4 cases, 3 Puget's procedures, 2 Saddles and different prosthetic devices in the remaining cases. All patients but one had reconstruction of the pelvis defect whom had no reconstruction. To avoid post operative dislocation of the prosthesis or allow fusion of hip arthrodesis all patients had spica cast after surgery.

Patients were retrospectively reviewed with a mean 7.6 year-FU (6 m. to 21 y). 20 patients were in remission, 3 had an evolutive disease, 16 were deceased. Five patients had a local recurrence and 2 developed a radioinduced tumour. Eight patients had an infection. In 7 out the 20 surviving patients a failure of the primary reconstruction occurred. All were revised by THR with bone reconstruction allowing secondary good anatomical and acceptable functional results. Most surviving patients developed a structural scoliosis when the hip was not reconstructed or when the reconstruction failed with proximal displacement of the femur. In spite of more mechanical complications, reconstruction with THR achieved the best functional results. For type I+II resections THR in a distal femur allograft screwed in the sacrum achieved the best mechanical and functional results with no infections. For type II and II+III resections, the ice cone prosthesis achieved good functional results with a very simple procedure. Reconstructions with pelvic allografts had the worse mechanical results with a high rate of infections.

After resection of the acetabulum for a bone tumour, hip transposition or absence of reconstruction seems the best way to decrease the rate of complications. In our experience, it was not possible to achieve a secondary reconstruction when the hip was left alone after resection. Children with hip transposition or unreconstructed hip joints developed severe scoliosis. Even in case of failure of a primary reconstruction, the feasibility of secondary total hip replacement advocates for the immediate reconstruction of type II resections in children.

Keywords : Pelvic tumour, children, ewing, osteosarcoma, total hip replacement, hip
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ONCOLOGIC OUTCOME FOLLOWING SURGERY FOR SACRAL CHORDOMA: 20 YEARS EXPIERENCE

Abstract ID : 1313
Submitted by : Denis Sofronov the 2016-02-15 10:50:19
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction Bone tumors of the sacroiliac joint often have a poor prognosis because of late diagnosis and difficult treatment.
The aim of the study to assess the surgical technique of reconstruction of the sacroiliac joint after resection of pelvic bone tumors and to determine oncological and functional results.

Material and methods. Since 2005 to 2015 years 27 patients with bone tumors of sacroiliac joints were operated in Russian Cancer Research Center. In all cases reconstruction of pelvic ring were performed. Patient with acetabulum involvement were excluded. There were 2 benign and 25 malignant tumors. The most often histological type was chondrosarcoma. Surgical procedure included tumor removing, reconstruction of pelvic ring with screws and rods and followed rectoabdominal flap rotation for adequate wound covering. In 7 cases we used computed-assisted navigation for safe margin during resection. The functional results were based on MSTS scoring system.
Results. The mean surgical time was 7 hours, mean bloodloss was 2400 ml. Resection with clear margin was achieved in twenty-six patients, and contaminated only on 1 patient. Twelve patients died: ten patients died due to tumor progression and two patients from other reasons. Local recurrence occurred in 6 cases (3 with distant mets). Deep infection observed in three patients (without rectoabdominal flap rotation), other patients had good wound healing. Functional results depended on nerve roots sacrifice due to involving in tumor.
Conclusion. Tumor resection of sacroiliac joint tumors is a difficult surgical procedure with uncertain prognosis. Radical surgery, reconstruction of pelvic ring and rectoabdominal flap rotation should be the treatment of choice for this tumors.

Keywords : tumor, pelvis, reconstruction
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Supplementary material : http://sites.altilab.com/files/122/abstracts/emos2016-2.docx, http://sites.altilab.com/
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What is the effect of pelvic ring disruption on function and oncological outcome following P1 resection of primary bone sarcoma?

Abstract ID : 1335
Submitted by : Michael Parry the 2016-02-15 22:56:22
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Primary sarcomas arising from the pelvis represent a unique surgical challenge with tumours often achieving a large size before prentation. Resection of pelvic tumurs with a clear margin can be difficult due to the close proximity of vital structures though advances in imaging, multimodal chemotherapy and surgical techniques have resulted in an increase in limb salvage surgery. The reconstruction of the pelvis following tumour resection remains an area of debate. He aim of this study, therefore, was to assess the effect of pelvic ring disruption following resection of tumours arsing from the ilium, looking in particular at the functional effect of pelvic ring disruption with or without reconstruction.
The study comprised a retrospective assessment of 64 patients treated surgically for tumours arising from the ilium. 35 patients underwent partial resection of the ilium and 35 were treated by complete resection of the ilium, of which 7 had no reconstruiction and 28 were reconstructed with either a non-vascularised fibula graft (24) or with extracorporeal irradiation and reimplantation (4). Functional outcomes were defined by the TESS at final follow up. Tumour charactersistics were defined according to tumour size, histological type and grade, and margin achieved at surgical resection. Operative time and blood loss as well as local recurrence and disease specific survival were also recorded.
The mean duration of follow up was 110 months. 50% of the cases were chondrosarcoma. 18.8% of patients suffered a complication following resection. The mean TESS was 71.6%. For those treated by partial P1 resection it was 76.3% whilst for those treated by total P1 resection without reconstruction it was 53.3% and for those treated by total P1 resection with reconstruction, it was 72.0%. The incidence of local recurrence was 42.2% and was more common in those treated by partial P1 resection. The risk of local recurrence was adversely affected by the margin achieved at resection. In 50% of patients treated for a low-grade chondrosarcoma who developed a local recurrence, the recurrence was at a higher grade than the primary tumour. The 5 year overall survival was 70.2% and at 10 years was 62.9%. High grade, local recurrence and margin were all poor prognostic factors for survival.
Given the high rate of local recurrence following tumour resection from the ilium, total P1 resection should be considered for all high-grade lesions. In young patients, where late recurrence may occur, radical surgery should also be considered. When total resection of the ilium is considered, reconstruction should also be considered as the confers a higher functional outcome than total P1 resection without reconstruction.

Keywords : Pelvis, sarcoma, reconstruction
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Management and retrospective analysis of metastatic sacral tumors: analysis of 80 cases

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Submitted by : Ruggieri Pietro the 2016-02-17 05:15:37
Category : Pelvic bone tumours
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Authorisation to disclose : Yes/Oui

Introduction. The sacrum is composed of bone, cartilage, bone marrow, neurologic structures as well as notochord remnants. Malignant sacral tumours can arise from any one of its components, but they are relatively rare (6% of all malignant tumors). Metastases were the second most common tumor after chordoma involving the sacrum.
Material and Methods. We retrospectively reviewed 80 patients with metastasis of the sacrum treated between 1975 to December 2012. There were 43 males (53%) and 37 females (47%) treated at a mean age of 60 years (range 22 to 79 years). Pain and neurologic impairment were the most common symptoms. Pain was reported by 93% of the patients at a mean of 7.2 months. Bone scan was positive in 95% of the cases, whereas false negative X-Ray was observed in up to 50% of the patients. Sacrum was the unique site in 47 cases (59%) whereas in 33 cases there were multiple lesions. Biopsy was performed in 71% of the cases. Colorectal and renal carcinoma were the most frequent lesions in patients with sacral metastases, but in 36% of the cases the primary tumor was unknown.
Results: Treatment consisted of chemo/radiotherapy whereas surgery has been used in 15 patients only (19%). Surgery consisted in laminectomy and decompression in 6 cases, palliative curettage in 5 and sacral resection in 4 cases. Palliative selective arterial embolization was used in 11 cases, elettrochemotherapy in 2, termoablation in one. The mean follow-up was 6 years (range 6 months –27 years). All patients but 5 died with disease and the mean overall survival was 6.7 months.
Four patients were alive with metastatic disease at last follow-up whereas one patient was NED after wide surgical resection of the sacrum due to metastatic squamous cell carcinoma and soft tissue reconstruction.
Conclusion. Metastatic tumors of the sacrum had a significantly worse outcome than in other locations. The treatment of cancer patients with bone metastases is multidisciplinary. The goals of treatment in these patients is pain control, maintenance of independence and prevention of tumor progression, and improvement of quality of remaining life. Currently, modern treatments are available for the palliative management of patients with metastatic bone disease. These include modern radiation therapy, chemotherapy, embolization, electrochemotherapy, radiofrequency ablation, and high intensity focused ultrasound.

Keywords : Sacral tumor, Pelvi, Palliative treatment
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Surgery Of Pelvic Chondrosarcomas: A Review Of 309 Cases From Three Institutions

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Authorisation to disclose : Yes/Oui

Introduction. Treatment of pelvic chondrosarcoma (CS) is a difficult problem for the musculoskeletal oncologist. Aim of this retrospective study was to review the long-term oncologic and functional outcome of surgical management in a large series of patients with pelvic CSs.
Material and Methods. We analyzed 309 patients treated in three institutions between 1975 and 2013: 193 males (63%) and 116 females (37%) with a mean age of 46.4 years (range, 15 to 81 years). There were 136 central CSs (34, 83 and 19 cases grade 1, 2 and 3 respectively), 109 peripheral CSs (60, 47 and 2 cases grade 1, 2 and 3 respectively), 36 dedifferentiated CSs, 4 clear cell CSs, 2 mesenchymal CSs and 3 periosteal CSs, 19 otherwise defined CSs. Tumor involved the iliac wing in 74 cases, iliac wing and sacro-iliac joint in 13 cases, iliac wing and periacetabular bone in 39 cases, anterior arch and periacetabulum in 57 cases, anterior arch only in 35 cases, acetabulum only in 42 cases and the entire hemi-pelvis in 49. Forty-nine patients had an external hemipelvectomy (16%), whereas 260 patients (84%) underwent a limb-salvage procedure: 144 resections without reconstruction and 116 resections with reconstruction. Margins were wide in 212 cases, wide but contaminated in 23 cases, marginal in 50 cases and intralesional in 24 cases.
Results. Survival on Kaplan Meier curve was 73% and 70% at 10 and 15 years respectively. At a mean of 9 years (1 to 32 years), 188 patients (61%) were continuously NED, 28 were NED after treatment of local recurrence (9%), 54 (17%) DWD, 13 (4%) died of other causes and 26 (8%) AWD. In central and peripheral CSs, high-grade tumors correlated with worse survival. Dedifferentiated CS had a significantly worst prognosis ($p<0.0001$). At multivariate analysis on survival, stage and grade statistically influenced prognosis. Overall incidence of local recurrence was 27.8% (86 patients).
Conclusion. Surgery is the mainstay of treatment for pelvic CS. CSs with acetabular involvement offer challenging technical problems to reliable and lasting reconstruction. There was a significant correlation between histologic grade and survival. New medical treatments need to be investigated for high grade CSs.

Keywords : Pelvic Tumors, Chondrosarcoma, Acetabular Reconstruction, Limb Salvage
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Mid-term clinical outcome in patients with pelvic peripheral chondrosarcomas

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Submitted by : Robert Van der Wal the 2016-02-19 16:49:08
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background
The pelvis is the most common location for peripheral chondrosarcoma. Studies on patients with pelvic chondrosarcoma are scarce and none reported merely on peripheral chondrosarcomas. Aim of this study was to evaluate oncological outcome and complications after surgery.

Methods
We retrospectively reviewed all 33 patients with peripheral chondrosarcomas of the pelvis who were treated at our institution from 1988 to 2013. Mean follow-up was 7.6 years (95% Confidence Interval (CI) 5.8 – 9.4 years). No patients were lost to follow-up. Nine patients (27%) had multiple osteochondromas (MO).
Predominant tumor site was the ilium (P1), in 15 patients (45%). Two (6%) tumors were located in the periacetabular region (P2), 9 (27%) in the pubis (P3), 6 patients (18%) had a chondrosarcoma of the ilium with involvement of the sacrum or lumbar spine, one chondrosarcoma (3%) was located in the P2/P3 region with involvement of the proximal femur.
All patients were treated with a limb-salvaging en bloc resection. Reconstructions were performed using allografts (n=2, 6%), saddle prosthesis (n=1, 3%) or total hip arthroplasty (n=1, 3%).

Results
The majority of patients had a grade 1 chondrosarcoma (n=23, 70%), followed by grade 2 (n=9, 27%) and one dedifferentiated lesion (3%). All nine grade 2 lesions occurred in patients without MO (p=0.035). Soft tissue infiltration was observed in seven specimens; 2/23 (9%) grade 1 and 5/9 (56%) grade 2 lesions (p=0.012).
At latest review, 25 patients had no evidence of disease (75%) and one patient (3%) was alive with disease. Seven patients (22%) had died, four due to progressive disease (12%). Median disease-specific survival was 6.0 years (95% CI 4.8 – 7.1); estimated disease-specific survival rates at two, five and ten years were 100%, 93% and 78%, respectively. Local recurrence was diagnosed in 6 patients (18%). Recurrence-free survival rates at two, five and ten years were 91%, 84% and 76%, respectively. Histological margins were clear in 28 patients (85%) and intralesional in five (four grade 1, one grade 2). The risk of local recurrence was related to tumor grade (p=0.026). Patients with intralesional resection margins had a higher risk of local recurrence (2/5, 40%) than those with clear resection margins (4/28, 14%) (p=0.170). Soft tissue infiltrating tumors demonstrated a higher risk of recurrence (2/7, 29%) than intra-compartmental tumors (4/26, 15%). Disease-specific survival was significantly worse for patients with local recurrence (p<0.001).
Postoperative infections were seen in 4 patients (12%). Main reasons for reoperation (total 27%) were surgical treatment of surgical site infection (44%) and local recurrence (44%).

Conclusions
To our knowledge, this is the first report focusing merely on patients with peripheral chondrosarcoma of the pelvis. Local recurrence and tumor grade are the most important predictors for disease-specific survival. Intralesional resections and tumors with soft tissue infiltration demonstrated a higher risk of local recurrence, underlining the importance of marginal en bloc resection at primary surgery. An EMSOS study is required to identify risk factors in oncological outcome in patients with pelvic peripheral chondrosarcomas.

Keywords : pelvic peripheral chondrosarcoma, oncological outcome, survival, clinical outcome
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Risk factors for deep infection after endoprosthetic reconstruction of the pelvis

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Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction

Traditionally, periacetabular tumor resections and subsequent reconstructions have been associated with dissatisfying rates of mechanical and non-mechanical complications. With the introduction of the LUMiC® prosthesis (ImplantCast, Buxtehude, Germany), we have been able to substantially reduce the rate of mechanical complications. However, despite anti-infective precautions (including silver coating of implants and the use of prophylactic antibiotics), deep infection is still of frequent occurrence. In the current study, we aimed to identify risk factors for infection after these complicated procedures.

Materials and methods

We retrospectively evaluated all patients who underwent periacetabular tumor resection and reconstruction with the LUMiC® prosthesis in eight centers of orthopaedic oncology, with a minimum follow-up of 12 months. The main end-point for this study was deep infection occurring within 12 months after surgery. We excluded patients with preceding reconstructions of the pelvis. All patients had antibiotic prophylaxis. A total of 60 patients (25 males, 48%) with a median age of 56 years (16-78) at surgery were included. Conventional chondrosarcoma (n=18, 30%), metastatic carcinoma (n=12, 20%) and osteosarcoma (n=8, 13%) were the predominant diagnoses. Median follow-up was 32 months (95% CI 20-44).

Results

Sixteen patients (16/60, 27%) developed a deep infection in the first 12 months, necessitating a total of 62 reoperations (range per patient, 1-16). Three patients (5%) had their implant removed due to the infection. The risk for deep infection was 19% (5/27) after P2 resection, 31% (9/29) after P1/2 or P2/3 resection, and 50% (2/4) after P1/2/3 or P2/3/4 resection. Median duration of surgery was 6.8 hours (4.5 – 13.6) for patients with an infection and 4.9 hours (2.8 – 12.0) for those without (p=0.004); consequently, median blood loss was 3.000 ml (400-14.000) for patients with an infection and 1.200 ml (400-7.500) for those without (p=0.006). Patients with a BMI ≥30 had a significant higher risk of infection (6/8, 75%) than those with a BMI <30 (10/52, 19%) (p=0.001). The infection rate was lower for ASA 1 patients (3/19, 16%) than for ASA 2 or 3 patients (13/41, 32%) (p=0.195). The use of silver-coated cups was not associated with a lower infection rate (12/34, 36%) than the use of uncoated cups (4/26, 16%). Patients who received neoadjuvant chemotherapy had no greater risk of infection (5/25, 20%) than those who did not (11/35, 31%).

Conclusions

Although the majority of the infections can be eradicated without removing the implant, deep infection remains of major concern after pelvic tumor resection and subsequent endoprosthetic reconstruction. The extent of the resection is a rough indicator of the infection risk. Surgical duration, blood loss and BMI ≥30 were closely correlated to the risk of postoperative infection. Our results suggest that other factors, such as chemotherapy and silver coating of implants, play a lesser role than is often assumed. Future prospective studies will need to control for the use of these co-factors.

Keywords : pelvic reconstruction, deep infection, periacetabular reconstruction
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Survival and functional outcome following a Modified “Harrington” Procedure for Advanced Metastatic Destruction of the Acetabulum

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Submitted by : Jonathan Ward the 2016-02-26 09:50:50
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction
Acetabular destruction because of pathological fractures due to metastatic disease remains a difficult surgical challenge. Surgical reconstruction of peri-acetabular lesions can be complex and many previous reports describe procedures involving long operating times, extensive exposures and considerable blood loss. In 1981 Harrington described a technique for reconstruction of the ilium, using threaded pins inserted retrograde through the acetabular roof and into the iliac wing. The pins were cemented together with an acetabular support ring into which a polyethylene socket was then cemented. Harrington reconstruction remains a relatively simple, safe and reproducible technique to reconstruct major acetabular defects caused by metastatic disease.
Patients and Methods
We reviewed the outcomes of reconstruction with hip replacement implants augmented with a modified “Harrington” procedure. We retrospectively identified 64 patients who were surgically treated for metastatic disease of the acetabulum between 1992 and 2015. 15 patients survive and were reviewed and completed an Oxford Hip Score and SF-36 assessments.
Results
The mean survival following reconstruction was 56 months (range 0-145). The surviving patients mean time from surgery was 81 months (7-145). The surviving patients mean age was 73 years (44-89). Mean Oxford Hip Score was 36 (20-48). SF-36 physical component summary score was 35 (19-54) and mental component summary score was 54 (43-59).
Conclusion
Harrington reconstruction has been considered a procedure for patients with a limited prognosis. Our series showed that for those patients surviving longer periods following reconstruction had Oxford Hip Scores similar to patients with mild to moderate hip arthritis, and despite some limitation of activities had good emotional quality of life. Our series show that these reconstructions work well in the long term and should still be considered an alternative to complex reconstruction for metastatic disease.

Keywords : Acetabular reconstruction, Harrington, pelvic metastases
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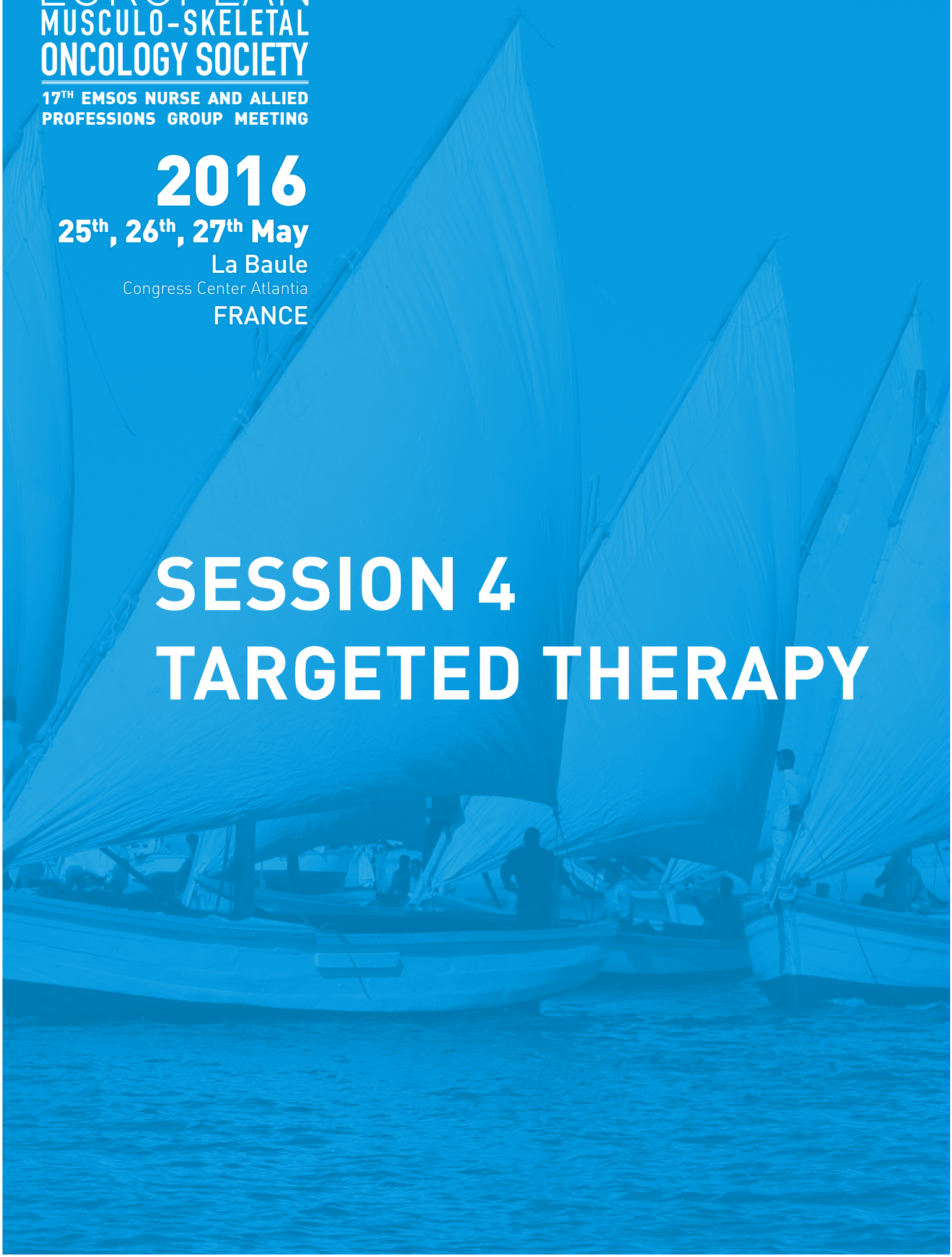

SESSION 4
TARGETED THERAPY

NETRIN-1 INTERFERENCE TO PREVENT OSTEOSARCOMA PROGRESSION AND METASTATIC DISSEMINATION

Abstract ID : 1129
Submitted by : Morgane Monchanin the 2016-02-04 14:13:16
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Despite the intensification of chemotherapy regimen, 5 years survival for patients with metastatic or relapsed osteosarcoma remains of 20 %. Many signaling pathways are deregulated in osteosarcoma thus targeted therapies are investigated for osteosarcoma treatment. The secreted factor netrin 1 (Nt-1) is overexpressed in many human cancers as a mechanism to block apoptosis. Recent studies showed that chemotherapies induce Nt-1 overexpression in tumors and that blocking Nt-1 interaction with its receptors potentiates chemotherapy efficacy. These data suggest that combining chemotherapies with Nt-1 interference could be a promising therapeutic approach for resistant tumors like osteosarcoma. Thus we evaluated the antitumoral and antimetastatic effects of anti- Nt-1 monoclonal antibody (Anti-Nt-1) combined to doxorubicin in a rat syngeneic and metastatic osteosarcoma model.
Doxorubicin and Anti-Nt-1 were tested as single agent or in combination in rat osteosarcoma model in two settings: as curative treatment or in a phase-II like relapsed models. In both settings, treatments were administered twice a week over a period of 3 to 4 weeks. Tumor progression was monitored throughout treatment by caliper measures and MRI imaging. At the end of the experiments tumors and lung were collected for molecular and immunohistological analyses. To confirm Nt-1 induction by chemotherapies, the expression of Nt-1 and dependence receptors were analyzed by RT-qPCR. Effect of treatments on osteosarcoma progression was examined conventional histological analyses (HPS and TRAP staining). Moreover treatment's impact on tumor vasculature and immune infiltrate were analyzed by immunohistochemistry using primary antibodies specific for CD3, CD8, CD163 and CD31.
In progressive tumor model, the combination of Anti-Nt-1 and doxorubicin caused a marked delay in tumor progression, and increased animals survival (median end point was reached at day 17 in doxorubicin-treated group and at day 22 in doxorubicin + Anti-Nt-1 group, p = 0.0183). Moreover, this combination dramatically slowed down metastatic spreading. At the end of the study 75 % animals treated with doxorubicin and 17% treated with doxorubicin and Anti-Nt-1 had lung metastases ≥5 mm diameter. A 2.2 fold increase in Nt-1 expression was observed in the doxorubicin +/- Anti Nt1 treated tumors (p = 0.0483). In the "phase II like" settings, the combination of doxorubicin and Anti-Nt1 caused a delay in tumor relapse and increased animals survival (median end point was reached at day 15 in doxorubicin group and at day 21 in Anti-Nt-1 group; p = 0.0159). This treatment slowed down metastatic spreading: 75% animals treated with doxorubicin had lung metastases versus 25% of the animals treated with doxorubicin and Anti-Nt-1.
Combination of doxorubicin and Anti-Nt1 showed both antitumor and anti metastatic activities, either in progressive or relapsed tumor. These data indicate that this combination could be a way to overcome osteosarcoma chemoresistance and could benefit osteosarcoma patients. The mechanisms of action of this new drugs combination are currently being investigated, more precisely its effect on chemoresistance effectors and on tumor immune microenvironment

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Keywords : osteosarcoma, metastases spreading, Anti netrin 1, chemotherapy, tumor progression
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HBP-bound doxorubicin: the promising new therapy for bone cancer

Abstract ID : 1135
Submitted by : Emmanuelle David the 2016-02-05 14:01:01
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Atlanthera is a drug discovery company specialized in bone-targeted drug delivery through covalent binding of drugs to hydroxybisphosphonates (HBP), a class of molecule known for high affinity to bone. To answer therapeutic needs in treating primary and metastatic bone tumors, Atlanthera has developed new compound 12b80, a HBP-bound doxorubicin.

Material and methods
12b80 was compared in-vitro with native doxorubicin for hydroxyapatite binding and release capacity, cytotoxicity on 12 tumor cell lines and subcellular localization. Antitumor effects of 12b80 were investigated in mice and rats following intravenous treatment in 5 orthotopic xenograft models of osteosarcoma (paratibial injection of OSRGa, HOS, UMR106, MOS/J or LM8 cells), 2 models of Ewing's sarcoma (paratibial injection of human TC-71 and SK-ES-1 cells), 4 models of osteosarcoma-derived lung metastasis (intravenous or intratibial injection of OSRGa, HOS or LM8 cells) and 2 models of bone invasion by intratibial injection of PC-3 cells (human prostate adenocarcinoma) or MDA-MB-231 cells (human mammary adenocarcinoma). Tumor development was assessed by monitoring animal survival, paratibial tumor volume, bone destruction and tumor response to therapy (histological analysis of tumor invasion, growth and destruction). Toxicity was evaluated on rodents and dogs by biological monitoring, necropsy and histopathological analysis of organs. Biodistribution of compound was examined in mice by microscopy and HPLC tissue analysis.

Results
Efficiency. 12b80 treatment promoted strong antitumor effects both in-vitro and in-vivo in all of the primary and invasive tumor models tested. 12b80 displayed a dose-response therapeutic effect and was more potent than combination of doxorubicin and zoledronate. Interestingly 12b80 was clearly detected in mineral deposits of primary and metastatic tumors.
Toxicity. In-vitro, 12b80 resulted in a 10 fold lower cytotoxicity compared to doxorubicin. Mice supported a 10 fold higher dose of 12b80 compared to doxorubicin. 12b80 was well tolerated and induced mild medullar toxicity, which was recovered within two weeks. 12b80 showed no sign of cardiotoxicity or osteonecrosis in rodents and dogs.
Biodistribution. Plasmatic half-life of 12b80 was around five hours. Bone distribution of 12b80 was within five hours and remained for months. 12b80 was detected in liver, spleen, kidney and lung but not in heart or brain. Major routes of 12b80 elimination were the renal and intestinal system.

Conclusion
Atlanthera demonstrated with the 12b80 candidate proof of concept of preclinical bone-targeted doxorubicin delivery. 1/ Selective bone tissue and bone tumor targeting allowed reduction of side effects and systemic toxicity. 2/ Targeted drug release achieved high local concentration of the drug, leading to higher potency. 3/ Antiresorptive effect of HBP potentiated antitumor effect by preventing the vicious cycle between tumor development and osteolysis. Altogether these promising results indicate that 12b80 is a perfect candidate for new therapy of bone tumors. 12b80 compound is currently on veterinary clinical trial in dogs with spontaneous osteosarcoma. Clinical trial phase I/IIa in humans is planned for 2017 as an orphan drug in adult osteosarcoma salvage therapy.

Keywords : HBP, doxorubicin, bone cancer, therapy
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Supplementary material : http://sites.altilab.com/files/122/abstracts/atlanthera-emsos-abstract.pdf, http://sites.altilab.com/
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Role of hypoxic biomarkers in pediatric high grade osteosarcomas

Abstract ID : 1216
Submitted by : NATACHA ENTZ-WERLE the 2016-02-12 00:31:18
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Intratumoral hypoxia plays a fundamental role in tumor progression and resistance to therapies. Tumor cell adaptation to a hypoxic environment is regulated partially by the Hypoxia Inducible Factor-1alpha (HIF-1α), which is involved in gene expression of energetic metabolism, angiogenesis or metastatic processes. HIF-1α accumulation in cells is in particular driven by oncogenic pathway activation, mainly PI3K-AKT-mTOR and RAS-MAPK-mTOR pathways. Those pathways are frequently involved in pediatric osteosarcomas, where new innovative therapies are urgently needed in relapsing cases. Most of the studies are focusing on HIF-1α but little is known about hypoxia related biomarkers. Therefore, in this study, a CGHarray analyses of hypoxia targets and the functional inhibition of those pathways were performed to understand further their role in pediatric high grade osteosarcomas
Material and methods: A collection of 67 fresh-frozen pediatric osteosarcomas was established at diagnosis prior any treatment and a arrayCGH (Agilent 4x44k) was performed on extracted DNAs of those patients. GISTIC 2.0 analysis identified all significantly overrepresented amplified or deleted chromosomal regions and associations to targeted genes. Complementary assays focusing on mTor/HIF-1α inhibition with rapamycin plus irinotecan were done on SaOS2, U2OS and one patient-derived cell lines.
Results: The genome analyses confirmed the gain of several regions containing specifically genes involved in the decrease of HIF-1α expression and those genes like USP133 or ULK1 were statistically linked to good response to first line chemotherapy. On the contrary, gain of VWA3B increasing HIF-1α expression is present in poor responders and relapsing patients. The inhibition of mTor and HIF-1α showed promising results with a complete inhibition of cell growth when using both inhibitors.
Conclusion: Hypoxia upregulation seems to be a mechanism associated to poor responders to treatment and relapsing patients and their biomarkers might be new targeted genes in pediatric osteosarcomas

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Keywords : hypoxia / osteosarcoma / mTor / HIF1
Authors :
References : , , ,

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Denosumab in patients with giant-cell tumor of bone in Norway; results from a nationwide cohort

Abstract ID : 1225
Submitted by : Kjetil Boye the 2016-02-12 09:27:53
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Denosumab is a relatively new treatment option for patients with giant-cell tumor of bone (GCTB). The purpose of this study was to report the results for patients treated in Norway.

Patients and methods: Patients treated with denosumab for GCTB were identified from the clinical databases at the Norwegian sarcoma reference centers. Data was collected by retrospective review of patient records.

Results: Eighteen patients treated with denosumab for GCTB were identified. Denosumab was given for recurrent disease in seven cases and as first line treatment in 11 patients, of which six received therapy as part of a neoadjuvant/adjuvant strategy and five for surgically unsalvageable primary tumor. Ten of 12 patients with recurrent or unresectable disease are still on denosumab without progression with median treatment duration of 25 months (range 6-40). Two patients discontinued treatment due to osteonecrosis of the jaw and reduced compliance, respectively. In the adjuvant group, three patients experienced disease recurrence after stopping denosumab, two patients are disease-free after 11 and 7 months, and one patient currently receive adjuvant treatment. In three of six patients, the extent of surgery was reduced due to neoadjuvant therapy. Seventeen of 18 patients underwent 18F-FDG PET/CT response evaluation at median 4.7 weeks from starting denosumab. Median baseline SUVmax was 11.0 and median SUVmax at evaluation was 4.9 ($p<0.001$).

Conclusions: In a nationwide GCTB patient cohort, denosumab was an effective agent and durable responses were observed. Adjuvant therapy seems questionable. 18F-FDG PET/CT could be a valuable tool for early response evaluation.

Keywords : giant-cell tumor of bone, denosumab, 18F-FDG PET/CT,
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The effect of EGFR or KRAS mutation on survival in non-small cell lung cancer patients with bone metastases

Abstract ID : 1233
Submitted by : Julie Willeumier the 2016-02-12 16:29:05
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction Until recently, non-small cell lung cancer (NSCLC) was considered a single entity and systemic treatment of metastatic disease was limited to platinum-based chemotherapy. Median overall survival (OS) of patients with bone metastases was 2-3 months. Since the identification of molecular mutations such as EGFR and KRAS , and the development of successful targeted therapies (e.g. EGFR-tyrosine kinase inhibitors (TKIs)), a paradigm shift has occurred in the treatment of NSCLC patients. Based on the now diverging expected survival within the spectrum of NSCLC, with EGFR+ having a better OS, a more personalised choice for non-invasive versus invasive local treatment options is available for those patients suffering from bone metastases in the spinal column, pelvis or long bones. This study aims to determine risk factors for overall survival and assess the effect of the EGFR and KRAS mutation status in NSCLC patients with bone metastases.

Methods A retrospective analysis of all NSCLC patients treated for bone metastases at the radiotherapy and/or orthopaedics department of a tertiary referral centre from 2007 to 2014 was performed. Patients with spinal, pelvic or long bone metastases were included if mutation analysis for EGFR or KRAS had been performed. Mutation analysis was only on indication before 2009 and standard as of 2009. One hundred and thirty-nine NSCLC patients were included, with a minimal follow-up of 1 year.
The following risk factors for survival were analysed in a multivariate Cox-regression analysis: gender (53% male); age (mean 63.6 years (range 36-81)); presence of visceral or brain metastases (48%); Karnofsky Performance score (80-100 (23%), ≤70 (52%), unknown (25%)); EGFR positive (14%); KRAS positive (33%); chemotherapy (62%); and TKIs (12%). Survival times were estimated from the first local treatment for the bone metastasis.

Results Median overall survival was 3.9 months (95% CI 2.0 – 5.8). For patients with EGFR or KRAS mutations, median survival was 17.3 months (95%CI 13.9 – 20.8) and 1.8 months (0.8 – 2.9), respectively. Median follow-up was 3.2 years (95%CI 2.2-4.1). At the end of follow-up 93.5% of the patients had died. On multivariate analysis, EGFR mutations were associated with an improved survival (HR 0.071; 95%CI 0.007-0.679; p=0.022). KRAS mutations were not significantly associated with survival (HR 1.20; 95%CI 0.74-1.96; p=0.46). Chemotherapy was associated with improved overall survival (HR 0.48; 95%CI 0.27-0.79; p=0.004), while TKI's (HR 6.1; 95%CI 0.67-56.0) were not independently related to survival. The presence of visceral or brain metastases (HR 1.78; 95%CI 1.16-2.77; p=0.008) negatively affected survival, while a better Karnofsky performance score (HR 0.57; 95%CI 0.35-0.93; p=0.025) was associated with improved survival. Gender and age were not significant in the multivariate analysis.

Discussion Although overall survival for all NSCLC patients treated for bone metastases is poor, our study demonstrates a better survival in patients with an EGFR mutation. The role of EGFR in survival prognostication of NSCLC patients with symptomatic bone metastases has not been accentuated previously. These important results can aid physicians and patients when making personalised treatment plans.

Keywords : bone metastases, lung cancer, prognosis, survival, personalised care
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Targeting HGF/MET signaling in pediatric osteosarcomas is promising in controlling tumor cell migration

Abstract ID : 1352
Submitted by : NATACHA ENTZ-WERLE the 2016-02-16 20:53:32
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Osteosarcoma is the more frequent bone tumors in pediatrics having in 15% cases metastatic presentation at diagnosis. Few markers are linked to this metastatic evolution: several studies are describing MET as a marker of metastatic disease. The Hepatocyte Growth factor is binding this tyrosine kinase receptor MET. This interaction and their downstream pathways are involved usually in cell survival, proliferation and migration. To go further in MET role in pediatric osteosarcomas, its inhibition by onartuzumab was studied in commercialized cell lines and one patient-derived cell line.
Material and methods: Onartuzumab was tested in vitro in SaOS2, MG63 and one patient-derived (OS016) cell line panel at concentrations from 0.01 to 1 M. The same doses were also tested on transfected SaOS2 cell line with a plasmid encoding wild type (wt) MET gene. Cell proliferation and migration assays were performed to establish osteosarcoma cells response
Results: No impact of MET targeting was observed on cell proliferation, but the signaling pathway HGF/MET was significantly inhibited in transfected and regular SaOS2 cells and OS016 cells. Those cells exhibited after onartuzumab inhibition a significant decrease in migration properties. The amplification of wt MET after cell transfection increased significantly the efficacy of onartuzumab on migration inhibition.
Conclusion: Onartuzumab might be having a promising effect on migration in pediatric osteosarcomas presenting a MET amplified status at diagnosis

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Keywords : MET / HGF / osteosarcoma / migration
Authors :
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Clinical implications of repeated drug monitoring of imatinib in patients with metastatic gastrointestinal stromal tumor

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Submitted by : Kjetil Boye the 2016-02-19 15:10:12
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Imatinib is the preferred treatment for the majority of patients with metastatic gastrointestinal stromal tumor (GIST). Patients with low imatinib plasma concentrations have inferior progression-free survival, and increasing the dose from 400 mg to 800 mg daily might benefit certain patients. However, there are few studies of repeated measurements of imatinib levels, and therapeutic drug monitoring is not yet a part of routine clinical practice.
Patients and methods: Patients with advanced GIST receiving imatinib were included in the study from January 2011 to April 2015. Heparin plasma was collected at each follow-up visit. Ninety-six samples from 24 patients were selected for imatinib concentration measurement. Imatinib was recovered from plasma using a liquid-liquid extraction method, and extracts were analyzed with capillary electrophoresis coupled to electrospray ionization time-of-flight mass spectrometry. Associations between imatinib plasma concentration and clinical variables were analyzed by Students' t-test, univariate and multivariate linear regression analyses.
Results: The mean imatinib Cmin plasma concentrations for patients taking <400 mg, 400 mg and >400 mg daily were 782 ng/mL, 1132 ng/mL and 1665 ng/mL, respectively (p=0.01). In patients on 400 mg, mean intra- and interpatient variability were 36% and 68%, with plasma concentrations ranging from 195 ng/mL to 4491 ng/mL. High imatinib Cmin levels were correlated with age, low body surface area, low hemoglobin concentration, low creatinine clearance, absence of liver metastases and no prior gastric resection in univariate analysis. In multivariate analysis, age, gastric resection and liver metastases were included in the final model. Eight patients had disease progression during the study, and mean imatinib levels were significantly lower at time of progression compared to the previous measurement for the same patients (770 ng/mL and 1223 ng/mL, respectively; p=0.02). There was no significant change in imatinib plasma levels in patients with stable disease.
Conclusions: The variation in imatinib Cmin plasma concentration in patients with metastatic GIST was relatively large. Our results do not support repeated monitoring of imatinib levels on a routine basis. However, we have revealed clinical scenarios where drug measurement could be beneficial, such as for elderly patients, suspicion of non-compliance, patients who have undergone gastric resection and at the time of disease progression.

Keywords : Imatinib, gastrointestinal stromal tumor, plasma concentration, drug monitoring
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Evolution in treatment of locally aggressive Giant Cell Tumor of bone: analysis of 37 cases

Abstract ID : 1438
Submitted by : Francesca Totti the 2016-02-22 00:17:01
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Giant Cell Tumor of bone (GCTB) is an aggressive primary benign bone tumor causing progressive osteolysis, most commonly in periarticular locations. Due to high local recurrence rate after isolated curettage and morbidity of resection, different local adjuvants such as cementation, phenolization and cryosurgery have been used after intralesional curettage to improve local control and achieve joint preservation. Moreover, in recent years systemic targeted therapy with RANKL inhibitors (Denosumab) or bisphosphonates has been introduced in the treatment of GCTB.

Patients and Methods
We performed a retrospective review of all consecutive patients (n=37; M/F: 21/16; mean age: 36, range 17-66 years) who underwent surgical treatment for GCTB with the intraoperative use of cryosurgery between 2000 and 2015. It was primary diagnosis in 32 cases, recurrence in 5 cases. The lesions were most frequently localized in the lower limb (n=23; 13 distal femur, 4 distal tibia, 3 proximal tibia, 2 proximal femur, 1 rotula), followed by the upper extremity (n=7; 3 distal radio, 2 proximal humerus, 1 distal humerus, 1 hand) and the pelvis (n=7). Thirty-three patients (group 1) underwent intralesional curettage with adjuvant cryosurgery and bone defect reconstruction with cement (n=18), bone graft (n=9), bone graft and cement (n=6); in 5 patients zoledronic acid was added to bone and/or cement. Eighteen of these patients additionally received denosumab according to our istitutional protocol (10 pts before and after surgery; 4 pts only before surgery, 4 pts only after surgery); one patient received zoledronic acid before and after surgery instead of denosumab. In the remaining 4 patients (group 2), with pelvic and sacral lesions, cryosurgery was used during curettage/resection to reduce bleeding and facilitate the excision.

Results

The mean follow-up was 31 months (range 2-145). No patient suffered neurovascular injury. There were one skin necrosis and one superficial infection, both healed after conservative treatment. No fractures of on-site treated segments were observed, probably due to frequent use of preventive plate fixation (n=21). No deep infection was observed. Two patients with tumor located in the distal tibia developed radiographic osteoarthritis and osteochondral lesion of the talus, both asymptomatic. All tumors demostrated positive response to denosumab and a surgical “downstaging” was achieved in all 14 patients who received pre-operative treatment. No adverse effects of denosumab or zoledronic acid treatment was observed. Two patients of group 1 developed local recurrence (2/33, 6%), both patients were treated with denosumab (one before and after surgery; one only before surgery). One of these patients developed two more local recurrences and lung metastasis. A repeated curettage was performed in all cases, with actual local control.

Conclusion

On the basis of our results, our actual trend in the treatment of locally advanced GCTB is 3-4 doses of neoadjuvant Denosumab followed by aggressive curettage, criotherapy, acrilic cement added with bisphosphonates and plate fixation. A longer follow-up is needed to confirm our results.

Keywords : GCTB, targeted therapy, cryosurgery
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Denosumab in treatment of giant cell tumor of bone - first experience

Abstract ID : 1479
Submitted by : Michal Mahdal the 2016-02-22 20:03:40
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Indroduction: Giant cell tumor of bone is benign primary tumor of bone, characterized by local aggresive growth and low metastatic potential. Most common localized in articular end of bone. Histologically contains 2 groups of cells, osteoclast-like giant cells and mononuclear (stromal) cells. Stromal cells express RANK ligand and via the RANK-RANK ligand pathway activate osteoclasts. Denosumab is a monoclonal human antibody against RANK ligand and inhibits osteoklast-like giant cells. Denosumab is used for treatment in these cases – resectable tumor with unaccetable morbidity or unresectable, local recurrence and metastatic disease.
Methods: We used denosumab for treatment giant cell tumor of bone in 7 cases since 2012. Patients received 4 initial loading doses of denosumab and then every 4 weeks up to minimum of 6 months. We compared radiographic imagings to monitor response to treatment (reduction of soft tissue mass, mineralization, formation and maturation of bone). Histological response was determined postoperatively.
Results: All patients had positive response to treatment. We used denosumab as a preoperative therapy in 3 cases to allow joint preservation surgery. 2 patients underwent surgery at the moment - both had histologically confirmed absence of osteoclast-like giant cells, without any postoperative therapy. In 2 cases we used denosumab for treatment of local recurrence, because of unaccetable morbidity (amputation). One tumor, located in lumbar spine and sacrum, was unresectable. One patient had partial regression of pulmonary metastases. Only one patient had complication – osteonecrosis of the jaw.
Conclusion: Denosumab seems to be effective for treatment local advanced tumor, local recurrrence and metastatic desease. More data are necessary to clarify safety long-term use, alone denosumab treatment without surgery or incidence of local recurrence after denosumab discontinuing.

Keywords : Denosumab, Giant cell tumor of bone
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Denosumab as adjuvant therapy in giant cell tumor of bone: will surgery become obsolete?

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Submitted by : Santos Sandra the 2016-02-22 22:54:31
Category : Targeted Therapy
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Giant cell tumor (GCT) of bone is a common benign skeletal tumor, usually located in long bones but occurring ocasionally in unusual locations, commonly extending near the articular surface. It is locally aggressive, and the mainstay of treatment has been surgery, with either local curettage (associated with adjuvant techniques) or wider resection of the lesion. However, curettage presents with a high recurrence rate, and resection of the tumor, due to its proximity to articular surfaces, leads to considerable morbidity. Denosumab, a monoclonal antibody that targets the osteoclastic activity of GCT, has been in use as a potential adjuvant therapy.
Material and Methods: We reviewed clinical data and outcomes regarding patients with histological diagnosis of GCT treated with denosumab at our institution. Denosumab was administered at monthly intervals (120 mg subcutaneously), with additional doses on days 8 and 15 during the first month of therapy only; all patients were prescribed calcium and vitamin D supplementation. Disease status and clinical benefit were assessed based on monthly physical examination and patient reporting, and periodic radiologic imaging assessment. Descriptive statistical analysis was performed.
Results: A total of 10 patients were identified, 6 female (60%) and 4 male (40%). The median age was 39 (25–81) years. Only 4 patients presented with appendicular skeleton lesions; the remaining patients had GCT located to the spine and pelvis. The majority (70%; n=7) of patients presented with primary GCT, and 30 % (n=3) had recurrent tumor following previous curative intent procedures. Primary complain at presentation was pain, with only one patient presenting with a pathological fracture. 70% of patients had a Campannaci classification III tumor, and all patients had a grade 3 Enneking staging tumor. Patients were treated with denosumab for a median duration of 38 (19–72) months. Only one patient in this group had surgery with curative intent, after 19 months of treatment, due to recurrent pain and functional limitation; follow-up (569 days) showed no recurrence and good function. The remaining patients had significant pain relief and functional improvement. In all cases, there was radiological evidence (serial radiographs and CT scans) of denosumab efficacy, evidenced by arrest in bone lysis and increased cortical bone thickness and intralesional sclerosis. No significant adverse reactions to denosumab were registered.
Discussion and Conclusion: Only one patient in our group underwent surgical treatment, with good results and no recurrence to date. The remaining patients, most presenting with tumor locations in which surgery would lead to significant morbidity, are presently symptom free, with no local disease progression. These results support the notion that denosumab therapy may represent an important option for patients with resectable GCT, to control disease and achieve equivalent outcomes with less morbid procedures or even no surgery, and in unresectable tumors, to allow for disease control and symptomatic relief. Additional follow-up is needed to determine whether long-term denosumab therapy alone is effective in disease control, and to assess possible complications and/or adverse effects associated with prolonged treatment.

Keywords : Denosumab, Giant Cell Tumor, Treatment
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FLASH PRESENTATIONS

The attempt of Prevention of bone metastases based on markers of bone resorption (Tartrate Resistant Acid Phosphatase)

Abstract ID : 1152
Submitted by : Anatolii Diedkov the 2016-02-07 10:58:12
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. The bone metastases (BM) are usually diagnosed in 30-50% of cases of renal cell carcinoma (RCC). Also RCC is diagnosed because of BM in 48 % of the patients. The main methods of conservative treatment are bisphosphonates (BF) and radiotherapy.
Aim of the study. To identify the possibility of BF administration for the prevention of development of BM based on the tartrate resistant acid phosphatase (bone TRAP-5b) determining.
Methods. All patients received adjuvant therapy according to existing standard of treatment. According to risk of development BM (based on level of bone TRAP-5b) all patients with RCC without radiology determined BM (n=120) were divided into two groups: standard risk group (SRG) (n= 25) with mean bone TRAP-5b level for 4,4 ± 0,1 U/l and high risk group (HRG) (n= 95) with mean bone -TRAP-5b level for 6,5±0,2 U/l. The HRG contained two subgroups – 44 patients who received BF (BF+) and 51 who had not received BF (BF-). The morphologic 2-nd Fuhrman grade in SRG was in 60 % of patients and 3-rd and 4-th in 56,84 % of patients in HRG group. We determined the bone TRAP-5b levels every 3 months. The evaluation of BM was accessed with CT, MRI imaging, osteoscyntygraphia with Tc99m.
Results. The results showed the high degree correlation between elevated levels of bone TRAP-5b and the presence of bone metastases ($r = 0,9$, $p < 0,05$) in examined patients. We didn't receive any dependence of high TRAP-5b level with number of bone lesions. We determined a significant increasing of bone TRAP-5b in the HRG ($p < 0.05$), compared with SRG. The intermediate TRAP-5b levels remained within the reference values in SRG. We observed the gradual reduction of TRAP-5b levels for six months in BF+ subgroup of HRG (8,3 ± 0,7 U / l, 7,9 ± 1,6Od / l, 8,1 ± 0,8 U / l) and gradual increasing of TRAP-5b levels (8,0 ± 0,4 U / l, 9,6 ± 0,4 U / l, 10,0 ± 0,3 U / l) in BF- subgroup of HRG.
The statistically significant difference was obtained in the incidence of skeletal complications in HRG (BF+ and BF-) (20.5% and 54.9% respectively), ($\chi 2 = 11,78$, $p = 0.001$). The time to appearance of first bone lesions in patients of HRG did not differ between the two subgroups: (7,8 ± 0,9) months in patients BF+ subgroup and (7,8 ± 0,4) months in the BF- subgroup of patients. We diagnosed BM only in 2 patients (8,0%) of SRG.
Conclusions. Thus our data may indicate the high diagnostic sensitivity of boneTRAP-5b as a marker of metastatic bone lesions in patients with RCC. We think that bone TRAP-5b determination in these patients can improve the accuracy of early diagnosis of BM, to make the preventive activities in high risk patients, like treatment with bisphosphonates and to improve their outcomes.

Keywords : bisphosphonates, bone metastases, prevention
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Influencing role of osteosarcoma microenvironment

Abstract ID : 1524
Submitted by : Louis-Romée LE NAIL the 2016-02-26 18:18:41
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: osteosarcoma (OS) is the most frequent primitive malignant bone tumor. It is a rather complex pathology without any specific genetic marker for diagnosis. For pathologists, OS is defined as malignant cells producing bone matrix. As mesenchymal stem cells (MSC) are precursors of osteoblasts that produce the bone matrix, they are strongly suspected to be at OS origin. We hypothesis that some MSC with cancer stem cell (CSC) characteristics may be involved in: OS development, chemotherapy resistance and metastatic progression.

Material and methods: adherent cells from six human OS samples were isolated after tumor dissociation and culture in MEM α supplemented with 10% Foetal Bovine Serum and 1 ng/ml bFGF at 37°C in a humidified atmosphere (5% CO2/95% air). They were named OS derived cells (OSDC) and were compared to own patient bone marrow mesenchymal stem cells (BMMSC), which were harvested during surgery for biopsy or OS resection.
We tested MSC characteristics (cell surface markers, differentiation capacities…), CSC characteristics (sphere formation assay, tumor formation in imunocompromised mice, karyotype, metabolism (SeaHorse®)), and tumor growth support capacities in an induced human OS mouse model.

Results: OSDC had the same morphologic aspect and membrane expression profile as BMMSC (CD90+, CD105+, CD45- and CD34-). They kept differentiation capacities toward osteoblastic lineage and to less extend toward adipogenic and chondrogenic lineage, with variability between different OSDC populations. Chondroblastic OSDC showed spontaneous capacities to differentiated toward chondrogenic lineage. Vimentine and Smooth Muscle Actine Alpha markers were detected similarly in OSDC and BMMSC. Karyotype was normal for all 6 BMMSC and for 4 OSDC. OSDC showed CSC characteristics, with sphere formations in semi solid conditions, decrease of mitochondrial metabolism. In 2 OSDC populations, some karyotype abnormalities were found: a 30 megabases duplication of long arm of chromosome number 17 with translocation to the long arm of the chromosome number 8 for the first case. The second case is being currently characterised. However, no tumor formation was induced in immunocompromised mice. In coinjection mouse model, OSDC showed variable effects on tumor growth compared to BMMSC.

Conclusion: OSDC that were isolated from human OS samples did not demonstrate own tumor properties, but they were more like MSC with higher abilities to growth in ananchorage conditions (sphere) than BMMSC and changes in mitochondrial metabolism. They are highly suspected to be part of tumor microenvironment, rather than the tumor origin, and to support and modulate the tumor growth. More studies are necessary to individualize which CDOS factors influence tumor growth. Indeed, therapies targeting those stromal OS microenvironment factors could be used.

Keywords : Osteosarcoma. Cancer Stem Cells. Microenvironment.
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Rapid prototyping pelvic custom made prosthesis and patient specific instrument (PSI) in pelvic tumor surgery

Abstract ID : 1206
Submitted by : Massimiliano De Paolis the 2016-02-11 15:27:20
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction.
The complex three dimensional anatomy and the necessity for wide surgical margins make oncologic pelvic resections highly demanding. The reconstruction is associated with long operation time and high risk of early and late complications. Adequate reconstruction is the key to good and durable functional outcome. In the literature, there are several options available: prosthesis, allograft and allograft prosthetic composite.
Our technique allow to make and accurate planning of the resection and anatomical reconstruction. Rapid prototyping makes possible to plan and perform bone cutting jigs to achieve matched contact between the host bone and the custom implant. The goal of this technique is to obtain perfect contact device with simple fixation, reducing the time of reconstruction.
The aim of this study is to report our preliminary experience about the use custom made bone cutting jigs and trabecular titanium prosthesis in treatment of bone sarcoma.

Material and methods
From August 2013 to September 2015, we treated 5 patients with sarcoma of the pelvis, using the rapid prototyping technology. Histology was Ewing sarcoma in 4 cases and Chondrosarcoma in 1. Mean age was 27 years (range 17-35), four men and one woman. According with Enneking and Dunham classification there were 3 cases of type II-III, one type II and one type I. The mean follow up was 13 months (range 6-28). We performed functional evaluation using the Musculoskeletal Tumor Society score .
The achieved surgical margin was used to evaluate the accuracy of the bone cut. X-Ray and CT-scans of the patients have been acquired postoperatively to evaluate the matching between prosthesis and remaining bone.
Results:
Wide margins were obtained in all cases and no local recurrences were evident to now. Time of surgery was about 4 hours on average (range from 200 to 250 minutes).
In all cases the osteotomy guide was positioned in the planned area. Postoperative CT scan showed an excellent matching between bone and prosthesis in all cases.
We had a case of screw loosening which did not compromise implant stability.
Full weight bearing was allowed at a mean of 6 months.
After a mean follow up time of 13 months the first 4 patients had a satisfactory functional result (mean 24/30). No patient use supports and walk with evident limping. A mild pain, not requiring painkillers, was referred by two patients on the ischium tuberosity while seating.

Conclusion:
PSI allows to perform surgery with a short time and without bulky instruments or other supporting facilities.
Rapid prototyping is a promising technique able to perform high-precision 3D physical structures. From CT data in few weeks is possible to achieve a device equipped with perfect bone cutting jigs and custom made prosthesis. This early report showed as it possible to apply this technique in this very challenging orthopedic field. Short surgical time, adequate margins, low rate of complications and good functional results can be obtained. More cases and longer follow up is needed to establish this technique as the future standard.

Keywords : pelvic bone sarcoma, PSI, trabecular titanium, rapid prototyping, custom-made prosthesis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-3b.jpg, http://sites.altilab.com/files/122/abstracts/figure-8a.jpg
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Reconstruction of the Acetabulum by Massive Bone Allograft in Skeletally Immature Patients with Bone Sarcomas of the Pelvis

Abstract ID : 1415
Submitted by : Massimiliano De Paolis the 2016-02-21 18:38:05
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction :Surgical treatment of pelvic bone sarcomas remains challenging, especially in children and adolescents where the reconstruction methods have additionally to focus on the growing skeleton. In skeletally immature patients with partial or total P2 resections the authors utilized massive pelvic fresh frozen allografts without removing the femur head in order to maintain a natural anatomy.
Material: From 2001 to 2013 , 14 children (6 females and 8 males) with a mean age of 10 years (range 5—14) had a pelvic sarcoma resected including P2 region, for a bone sarcoma (12 Ewing, 2 Osteogenic sarcoma). All patients underwent perioperative chemotherapy. In two patients with Ewing, surgery was performed after preoperative radiotherapy.
Reconstruction utilized in all cases a pelvic fresh frozen massive allograft from Istituto Rizzoli Bone Bank, molded during surgery to reconstruct the removed pelvic bone and the acetabulum surface and fixed to the residual pelvic bones with screws and more rarely plates .Implant outcome was investigated on serial radiology in all cases during follow-up (f-up). Function was evaluated according MSTS.
Results: At a mean follow-up of 90 months (range 29-161, median 99) all patients are alive with no evidence of disease (2 after the treatment of distant metastases).
Postoperative infection occurred in one case (Ewing, preoperative radiotherapy) and the graft was removed in the first postoperative year. All the remaining 13 patients (93%) maintain the original allograft at last follow-up . Partial radiological resorbtion of the graft occurred in all cases with loosening of some screws there were revised in 6 cases . Significant degenerative joint arthritis preogressively appeared in 8 cases and four underwent a THR at a mean of 77 months from surgery (range 21-136). Limb length discrepancy of 1-5 cm was evident at last follow-up in 6 patients and one patient underwent successfully a femur lenghtening to compensate it. According MSTS functional evaluation at last follow-up there were 4 Excellent,2 Good,6 Fair and 2 Poor results.
Conclusions: Massive pelvic allografts in association with hip prostheses have been used in many centers for pelvic reconstructions in skeletally mature patients but very few reports have been published about their use in children as osteoarticular grafts . Recently for pelvic reconstructions involving P2 area, much more attention have been addressed, to customized megaprostheses. In this series we show that 93% of the patients still maintain the original implant and in 4 cases a standard THR was possible using the allograft bone to fix the acetabular cup.

Keywords : pelvic bone sarcomas, skeletally immature, fresh frozen allografts
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Relapsed Ewing sarcoma following inadequate treatment. Could their life and limb still be salvaged?

Abstract ID : 1405
Submitted by : Walid Ebeid the 2016-02-21 13:29:35
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

The prognosis of relapsed Ewing sarcoma after adequate treatment is very poor. What if the relapsed Ewing sarcoma is following inadequate treatment? Would these patients benefit from proper treatment? The aim of our study was to evaluate the oncological outcome of these relapsed patients if they were then treated adequately by limb salvage surgery and neoadjuvant chemotherapy.
47 patients with relapsed Ewing sarcoma of bone - who were initially treated inadequately in other centers - were referred to our institution. We treated 30 of them by limb salvage surgery and neoadjuvant chemotherapy. 16 patients were originally treated with inadequate chemotherapy protocols and radiotherapy, 10 patients were treated with surgical curettage and 4 patients were treated with curettage and radiotherapy. They were 16 males and 14 females. Their average age was 17 years (range 6 to 27). The tumour was located in the tibia (8), femur (8), humerus (5), fibula (4), clavicle (2), ulna (1), patella (1) and metatarsal (1). Patients underwent routine staging by local MRI and chest CT and bone scan as well as bone marrow biopsy. They received preoperative chemotherapy according to the POG 9354/CCG 7942 protocol. We used 5 drug regimen: vincristine, doxorubicin, cyclophosphamide, MESNA alternating with etoposide and ifosfamide. Cycles were given every 3 weeks and local control at week 12. The duration of treatment was 14 cycles. Surgical resection with a wide margin was done in 23 patients. The average resection length was 13cm (range 4 to 26cm). Reconstruction was done using a vascularized fibular graft in 11 patients, modular prosthesis in 8, non vascularized fibular graft in 1 and no reconstruction in 10.
Patients were followed up for an average of 46 months (range 6 to 180 months). Chest metastases developed in 13 patients (43%) and they all died subsequently. Local recurrence developed in 2 patients (6.6%) and they subsequently developed chest metastases and died. 16 patients had a poor response to chemotherapy. 11 of them (68%) developed chest metastases. Among the 14 good responders to chemotherapy, only 2 developed chest metastases (14%).
We conclude that relapsed Ewing sarcoma patients do not all have the same prognosis. Those who were initially treated inadequately may still have a reasonable chance for cure if they were managed by adequate surgery and chemotherapy.

Keywords :
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Stage 3 Giant Cell Tumor Of Bone Around The Knee: Intralesional Management Vs. En-Block Resection. Impact Of Intraarticular Fractures

Abstract ID : 1088
Submitted by : LUIS GOMEZ the 2016-01-25 17:15:05
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: To determine the local recurrence rate, and the implications of fractures in patients with Stage 3 giant cell tumor of bone (GCTB) around the knee, comparing the intralesional treatment to en bloc resection.
Materials and Methods: This is an observational retrospective case series study including surgically treated patients with GCTB stage 3 located at the distal femur and proximal tibia and proximal fibula from January 2000 to December 2011. Three scenarios were defined: a) No fractures, b) undisplaced articular cartilage fracture; and c) Intraarticular displaced fracture. The intralesional treatment was conducted with high-speed burring, adjuvants such as phenol, liquid nitrogen and / or argon beam; supplemented with PMMA and / or bone matrix and osteosynthesis with plates and screws. The recurrence rates of intralesional treatment and en-bloc resection was determined and compared. The minimum follow-up was 3 to 14 years.
Results: We found 169 cases of GCTB; 132 patients were at Stage 3. The location around the knee was n=78/132; distal femur 45/78, proximal tibia 26/78 and proximal fibula 7/78. Results by scenarios are: a) No fractures in n = 48 cases (femur n = 28 /48, tibia n = 13 /48, and proximal fibula n = 7 /48); b) Undisplaced articular cartilage fracture n = 13 (femur n=10/13 and tibia n = 3/13); and c) Intraarticular displaced fracture n=17 (femur n=14/17, tibia n=3/17). The intralesional treatment was applied when there were no fractures in n = 44 (femur n = 28 /44, tibia n = 15/44, and n=1/44 and n=1 of proximal fibula). Same treatment was applied when there was no displacement of the articular cartilage n = 12 (femur n=10/12, tibia n=2) and intra-articular fractures n=5 (femur n=2, tibia=3). There were 17 en-block resections corresponding to n=11/17 cases of intraarticular displaced fracture and n=6/17 from the fibula; the reconstruction methods were: osteochondral allografts in femur n=4/11, endoprosthetic reconstruction n=1/11, and arthrodesis n=1/11; of proximal tibia there were ostechondral allograft n=4/11 and arthrodesis n=1/11. We found the relapse of 5 cases in femur, n=3/5 after intralesional treatment and n=2/5 after en-bloc resection with allograft reconstruction. In the tibia, there were two cases with en-bloc resection and allograft reconstruction that relapsed. There was no relapse observed with endoprosthetic reconstructions and arthrodesis. The median time to relapse was 9.90 months (range 3.21 to 37.43 months) and the rate was 2.3 relapses per 100 patients / year.
Conclusion: Intralesional treatment of giant cell tumor of bone can be performed safely in Stage 3 GCTB around the knee, provided that the fracture does not displace the joint, since the association between tumor relapse in relation to intralesional management versus en bloc resection could not be established in this paper.

Keywords : GIANT CELL TUMOR STAGE
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/tcg-3-abstract.docx, http://sites.altilab.com/
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Technique and Results in Retransplantation of Radiosterilized Bone Tumours with and without Fibular Augmentation

Abstract ID : 1134
Submitted by : Hans Roland Dürr the 2016-02-05 06:44:28
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
After resection of bone tumors, the resulting defect must be reconstructed. Having a mechanical stable tumour resection specimen, particularly suitable in diaphyseal defects, replantation after sterilization with or without fibular augmentation is possible.

Patients and Methods
Between 1999 - 2015, this technique was done in 21 patients in 22 locations (one patient simultaneously in femur and tibia). Autoclaving was used just in one case in 21 cases we preferred radiation with 300 Gy. The average age of the 13 men was 41 years (10-83 years) that of the 9 women 47 years (12-79 years). The diagnosis was Ewing sarcoma in 8 cases, metastaatic disease in 6 cases (5 NCC, HCC 1), 5 osteosarcomas, chondrosarcoma, leiomyosarcoma and myxofibrosarcoma each one. The location was in 2 cases epimetapyseal (prox. tibia, dist. tibia), otherwise diaphyseal and metadiaphyseal. In 12 cases the lesion was in the femur, in 7 cases in the tibia in 2 cases in the calcaneus and in one case in the scapula. In 14 cases, a additional fibula was used. At follow-up 5 of the 21 patients (2 NCC, 1 HCC and 2 patients with Ewing sarcoma) had died. The follow-up was on average 52 months (6-129 months), in 3 patients less than one year.

Results
In one case (osteosarcoma after nailing of a pathological fracture before admittance) local recurrence developed outside the graft, we attribute that to fracture hematoma. Of 22 cases, only in 9 no revision for reasons as complications or nonunions had to be carried out. In 5 cases, 1 revison, in 4 cases 2 revisions, each one case 3, 4, 5 and 8 revisions were necessary. In 18 cases a complete healing was achieved, in 2 cases, there is a nonunion and in one case, the implantation of a tumorprosthesis (femur) was necessary. In one patient of a complete calcaneal replantation description of bone healing is technically impossible. Healing was achieved on average in 13 months (4-35 months).

Summary
Overall, the course of healing is lengthy but showed good results at the end. Ultimately, the patient must be prepared for a longer period of non or partial weightbearing and (as shown above in 55%) accept sometimes multiple revisions. The technique is safe in terms of tumor recurrence and in younger patients with diaphyseal or metadiaphyseal location now our standard procedure.

Keywords : Reconsruction of bone defects, retransplantation, radiosterilization, fibula transplantation
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Limited predictive value of the Spinal Instability Neoplastic Score for spinal instability after evaluation in 110 patients treated with radiotherapy for symptomatic spinal bone metastases

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Submitted by : the 2016-02-11 23:25:09
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: The Spinal Instability Neoplastic Score (SINS) has been developed to assess tumor-related spinal instability. However, it remains unclear whether the SINS system indeed predicts progressive spinal instability when applied to longitudinal patient cohorts. Therefore, the goal of the current study was to determine the predictive value of the total and individual components of the SINS for spinal instability in a cohort of patients treated with radiotherapy for spinal bone metastases.
Methods: The study population consisted of all patients treated with radiotherapy for symptomatic spinal bone metastases at our institution between January 2000 and December 2010. Patients who had both pretreatment computed tomography (CT) imaging and clinical and/or radiological follow-up were eligible for inclusion. Subsequently, each vertebral segment was scored according to the SINS criteria. The end points of the study consisted of the following adverse events: (1) the development of a new vertebral compression fracture (VCF); (2) progression of an existing VCF; and (3) progression of disease requiring surgical stabilization of the irradiated spinal segments. We determined the occurrence of these adverse events using patients' medical charts and/or follow-up imaging up to 12 months after initial radiotherapy. Subsequently, we defined time to event as the difference between start of radiotherapy and date of occurrence of an adverse event or last follow-up, with death being considered a competing event. A competing risk analysis was performed to estimate the effect of the total and individual components of the SINS on the cumulative incidence of the occurrence of an adverse event.
Results: The final study cohort included 110 patients. Of these, 16 (15%) experienced an adverse event during follow-up. The cumulative incidence for the occurrence of an adverse event at 6 and 12 months was 11.8% (95%CI 5.1%-24.0%) and 14.5% (95%CI 6.9%-22.2%), respectively. Univariate competing risk analysis showed that neither the final SINS classification, nor the six individual SINS components were significantly associated with the cumulative incidence of an event. The multivariate analysis showed that only the component location was significantly associated with the cumulative incidence of an adverse event (HR 0.54, 95%CI 0.30-0.96, p=0.04).
Conclusion: Based on this study, the clinical applicability of the SINS as a tool to assess spinal instability in patients undergoing radiation therapy for spinal bone metastases seems limited.

Keywords : instability, spine, bone metastases
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New technique for treatment of bone lesion using O arm navigated system

Abstract ID : 1256
Submitted by : ortal segal the 2016-02-13 21:46:02
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: To evaluate the use of navigated system based on O arm technology in the treatment of bone lesions mainly radiofrequency
ablation of osteoid osteoma and other benign bone lesions.

Materials and methods: during the year 2015, altogether 29 patients underwent thermal ablation of bone lesions at our institution. To access the lesion the surgical instruments were guided by O arm assisted navigation system. Procedure time, amount of scans, radiation exposure, and the clinical results were investigated.

Results: The navigated system was accurate in all cases and needle tip was in place verified in the second scan in all cases. The radiation exposure was decrease by an average of 33% as compare to conventional CT procedures. 28 of the 29 patients reported complete pain reduction within 48 hours after the procedure.

Conclusions The use of the navigated system based on O arm scans was feasible and facilitated the access to the bony lesions with significantly reduction in radiation exposure to the patient and staff.

Keywords : navigation, radiation, bone lesion
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Supplementary material : http://sites.altilab.com/files/122/abstracts/limos2.ppt, http://sites.altilab.com/
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Long-term Functional and Radiological Outcomes of Allograft Hip Prosthesis Composite. A 14 years Follow-up Study

Abstract ID : 1257
Submitted by : Arnaud DUBORY the 2016-02-13 22:15:13
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Allograft hip composite prosthesis (APC) and megaprosthesis represent the two types of reconstruction after resection of the proximal femoral bone. The aim of this study is to assess long-term clinical and radiological outcomes after an APC reconstruction and to seek factors influencing the survivorship and functional results.
Methods: Forty-six patients were retrospectively included (14 revision total hip replacements, 30 primitive malignant bone tumors, 2 metastasis). Hip prosthesis function was analyzed using Postel-Merle d'Aubigne (PMA) score, Musculoskeletal Tumor Society (MSTS) score and hip abductor strength. Postoperative radiographic setting included 100% magnified anteroposterior pelvis and whole femoral bone X-rays. Overall revision-free and femoral stem survivals were assessed using Kaplan–Meier method. Different factors potentially influencing hip prosthesis survival (Log Rank test) and clinical outcome of APC were searched (linear and logistic regressions).
Results: The mean follow-up was 14.7 years (range, 6.3 to 32.6 years). The mean length of femoral bone resection was 16.4 cm (range, 7 to 27 cm). At the last follow-up, PMA score was 15.7 (range, 8-21), MSTS at 23.1 or 77% (range, 15-29) and abductor strength at 3.4 (2-5). Allograft resorption was minor for 20 patients (44.4%), moderate for 13 patients (28.9%) and severe for 12 patients (26.7%). Pseudarthrosis of greater trochanter (GT) occurred in 26 cases (59.1%). Length of femoral bone resection, allograft bone resorption and pseudarthrosis of GT did not have effect on functional outcomes. Overall revision-free survival was 73±0.7% and 54.1±0.8%, respectively at 5 and 10-years follow-up. Femoral stem survival was 91.3±0.4% and 81.4±0.6% at 5 and 10-years follow-up respectively. No parameter evaluated influenced the survivorship.
Conclusion: APC is a reliable reconstruction especially well adapted for huge resection of the upper part of the femur. Pseudarthrosis of the GT and allograft bone resorption do not seem to influence functional results and abductor strength.
Level of evidence: Level IV

Keywords : primitive malignant bone tumor, allograft hip prosthesis, allograft resorption, pseudarthrosis, abductor strength
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1-emsos.pdf, http://sites.altilab.com/files/122/abstracts/figure-2-emsos.pdf
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Application and Survival of Growing Prostheses of the Proximal Tibia

Abstract ID : 1290
Submitted by : Michael Parry the 2016-02-14 16:52:32
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Approximately 20% of all primary bone tumours arise in the proximal tibia and of these approxiamtely 25% will be in skeletal immature children with growth remaining. Limb salvage, where possible, should be considered, as for the adult population, though the rate of complications are often high.
Aim: The aim of this study was to investigate the implant and patient survival of paediatric patients undergoing treatment for a primary tumour of the proximal tibia treated by resection and reconstruction with an extendable prosthesis. Oncological and functional outcomes following reconstruction, as well as the incidence of complications and the risk of subsequent amputation were also recorded.
Method: All patients undergoing treatment for a primary sarcoma of the proximal tibia treated by resection and reconstruction with an extendable prosthesis were identified from the institution's prospectively maintained database, and cross referenced to the manufacturer's log. Patient records were reviewed to identify patient and tumour characteristics, complications, subsequent treatment, function, recorded by MSTS, and patient and implant survival were all recorded.
Results: 64 children underwent an extendible proximal tibial replacement between 1983 and 2013. The most common indications were osteosarcoma in 50 and Ewing's sarcoma in 9. The mean age at implantation was 10 years (6-15). 56 implants required invasive lengthening and 8 were non-invasively lengthened. At the time of final follow up, 33 patients were alive. Periprosthetic infection occurred in 21 patients and necessitated amputation for definitive control of the infection in 8 patients. Local recurrence occurred in 5 patients and resulted in an amputation in 4. Of the surviving patients, only 2 had successful lengthening without any complications. The MSTS score was 18 at 1 year and 23 at final follow-up. The average leg length difference was 1.7 cm. There was no correlation between the age of the patients and the risk of complications.
Conclusion: Extendible replacements of the proximal tibia allow for limb salvage and comparable limb length restoration to the unoperated side, but with a high rate of complications. Alternative options might be considered when limb salvage is not the primary goal of treatment.

Keywords : Tibia, Endoprosthesis, Extendable
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Bipolar hemiarthroplasty in patients undergoing proximal femoral replacement for a bone tumor

Abstract ID : 1406
Submitted by : Michaël Bus the 2016-02-21 14:42:53
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background

Endoprosthetic proximal femoral replacement is a well-accepted technique in treatment of bone tumors. Nevertheless, numerous controversies exist related to the optimal reconstructive technique, including the need to resurface the acetabulum. To date, there is little evidence to support the different strategies. Our preferred technique during the last twenty years was hemiarthroplasty with use of a bipolar femoral head and an attachment tube. Aim of this study was to evaluate clinical outcome of these reconstructions.

Patients and methods

We retrospectively identified all patients with a proximal femoral replacement and a bipolar femoral head for an oncological indication between 1999 and 2014. During that time, bipolar hemiarthroplasty was preferred whenever acetabular quality was deemed sufficient intraoperatively. Patients with preceding massive reconstructions were excluded. Minimum follow-up was 12 months. We performed 55 bipolar hemiarthroplasties using MUTARS® (ImplantCast, Buxtehude, Germany) modular endoprostheses (n=35, 64%; 28 of which [80%] were uncemented) or filia prostheses (n=20, 36%; all cemented, mainly used for metastatic disease) in patients with a median age of 59 years (14-89) at surgery. Predominant diagnoses were chondrosarcoma (n=22, 41%), osseous metastases (n=14, 26%) and osteosarcoma (n=9, 17%). At review, 23 patients (42%) were alive with a mean follow-up of 63 months (95% CI 47-78).

Results

With failure for mechanical reasons (Henderson type 1-3) as the end-point, revision-free survival at five years was 93%. With failure for non-oncological reasons (mechanical failure and infection, Henderson type 1-4), revision-free survival at five years was 85%. An acetabular cup was later implanted in two reconstructions (4%): one because of pain complaints and one because of recurrent dislocations. Dislocations (Henderson type 1) occurred in five reconstructions; four of 38 (11%) reconstructions with a reconstruction length of ≥15 cm, and one of 17 (6%) reconstructions with a defect <15 cm. Dislocations occurred in four of 51 reconstructions with an attachment tube (8%) and one of three without (33%). Aseptic loosening and structural complications of the implant (Henderson type 2-3) were not observed. Infections (Henderson type 4) occurred in six reconstructions (11%); five of 38 (13%) reconstructions with a length of ≥15 cm, and one of 17 (6%) reconstructions with a defect <15 cm. One of 12 (8%) silver-coated implants got infected. Infections occurred in four of 28 uncemented reconstructions (14%) and in two of 27 cemented reconstructions (7%). Four implants (7%) were removed, two (4%) because of deep infection and two (4%) because of local recurrences.

Conclusions

Bipolar hemiarthroplasty appears to be a viable technique for reconstruction of the proximal femur after bone tumor resection, with a low rate of mechanical failure at mid-term follow-up. It appears that resection length is associated with the risk of dislocation and infection. In our experience, the attachment tube is useful for reinsertion of detached muscles and, when combined with the bipolar femoral head, its use is associated with an acceptable dislocation rate. Although studies with longer follow-up are needed to ascertain our findings, our results suggest that there is no need to replace the acetabulum in the primary setting.

Keywords : endoprosthetic reconstruction, proximal femoral replacement, bipolar hemiarthroplasty
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Conditional survival of patients with soft tissue sarcoma (STS) after curative resection

Abstract ID : 1412
Submitted by : Florian Posch the 2016-02-21 16:45:54
Category : Others
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction: Risk factors such as tumor grade and the AJCC staging system can stratify soft tissue sarcoma (STS) patients according to their probability of disease recurrence and survival, and thus inform immediate treatment decisions. However, it is currently unclear how the initial risk changes in STS survivors after primary therapy. Here, we apply the concept of conditional survival to prognosticate long-term outcome in STS survivors who underwent curative surgical treatment.
Methods: In this single-center historical cohort study, we explored the clinical course of 444 patients with localized STS (AJCC stages I-III; median age: 62.6 years, female: n=217 (48.9%)) who were treated with surgery in curative intent from 1995-2015. Two-hundred-sixty-one (58.8%) patients received adjuvant radiotherapy, and 40 (9.0%) received adjuvant chemotherapy. After a median follow-up of 5.5 years, we observed 44 (9.9%) local recurrences, 74 (16.7%) occurrences of distant metastasis, 65 (14.6%) STS-related deaths, and 59 (13.3%) deaths adjudicated to other causes. Primary and secondary endpoint were the 2-year conditional-disease-free (CDFS) and 2-year conditional-overall-survival (COS), respectively. The 2-year CDFS and COS were defined as the probability of surviving and remaining disease-free, or surviving, respectively, for an additional 2 years at a given time point after surgery.
Results: The 2-yr CDFS improved from 75.9% (95%CI: 71.2-80.0) at baseline, to 82.4% (77.5-86.3), 88.4% (83.4-91.9), and 90.3% (85.1-93.8) in patients who had survived disease-free for at least 1, 2, and 3 years, respectively. The 2-yr COS improved more modestly from 85.4% (81.4-88.7) at baseline, to 86.5% (82.2-89.8), 90.3% (85.9-93.4), and 91.5% (86.8-94.6) after 1, 2, and 3 of follow-up, respectively. At baseline, tumor grade G3 (Hazard ratio (HR)=3.3, 95%CI: 2.0-5.6, p<0.0001), AJCC stage III (HR=3.3, 95%CI: 2.2-5.1, p<0.0001), and a higher age (HR per 5 years increase=1.2 (95%CI: 1.1-1.3, p<0.0001) were the strongest predictors of a worse 2-yr CDFS. However, the adverse impact of higher tumor grades and a higher AJCC stage declined the longer the patients remained alive and free-from-disease. At 3 years after baseline, 2-year CDFS was neither associated with tumor grade G3 nor with AJCC stage III anymore, and patients with G3 (89.3% vs. 91.3%) or stage III disease (88.0% vs. 91.1%) had a comparable 2-year CDFS than patients without these high risk features, respectively.
Conclusion: In patients with localized STS undergoing curative surgery, 2-year CDFS continuously improves over time. However, 2-year CDFS does not appear to increase above 90%, which is partly due to background mortality from causes other than STS, and partly due to persisting risk of recurrence that may justify long-term clinical follow-up for these patients. Patients harboring poor risk features at tumor diagnosis such as tumor grade G3 or AJCC stage III do not do worse than good risk patients after having survived for at least 3 years.

Keywords : soft tissue sarcoma, recurrence death, conditional survival
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Skeletal Reconstruction for Bone Sarcomas in Children. What ‘s new? Analysis of primary Implants in the last twenty years at Rizzoli Institute

Abstract ID : 1419
Submitted by : Marco Manfrini the 2016-02-21 20:34:00
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Introduction: Skeletal reconstruction for bone sarcomas in children is a fascinating topic but, because of the rarity of sarcomas in the first decade of life, it is usually difficult to focus the attention to prepuberal age patients. Nevertheless in this age the surgeon must face very difficult hurdles related to small bone size and growth plate involvement. In the last twenty years several reconstructive techniques have been used and the author report a series of 323 prepuberal patients..
Methods: Clinical and radiological data of 323 skeletally immature patients (164 males and 159 females, age range 1-12, median 10) affected by bone sarcoma of long bones and pelvic periacetabular (P2) region and surgically treated at Istituto Rizzoli from 1995 to 2014 were analyzed,.
Diagnosis was primary Osteosarcoma (223),Ewing (95) and other HG sarcomas(5) and tumor locations included femur (178), tibia (72),humerus (45),radius or ulna (12) and pelvis P2 (16).
Primary surgery included 14 amputations (4%) and 14 type 1A rotationplasties (4%).
Limb-salvage techniques were groupable as
- Megaprostheses (103 implants including 37 distal femur expandable prostheses) -32%-,
- Alllograft-Prosthetic Composites APC (53 implants) -16%-
- Intercalary Reconstructions with Bone Grafts(84 implants with 34 massive bone allografts MBA, 8 vascularized fibula VF, 42 associations MBA/VF) -26% -,
- Osteoarticular Bone Grafts (50 implants with 32 MBA and, 18 growing VF.) -15% - .
The trend in the different indications during the study period was evaluated and long-term patient and implant survival was assessed.at last follow-up.
Results: At a mean follow-up of 96 months (range 13-245), 205 patients (63%) are alive (178 CDF and 27 NED after a tumor relapse). There were 16 (5%) secondary amputations (14 because of local recurrence) and 45 patients needed a complete revision of the original implant (15%) for mechanical (33) or septic (12) complications. Other 95 children underwent further surgical procedures for various mechanical problems or to manage the limb length discrepancy during the growth without removing the original implant. Complete failure of the primary reconstruction was shown in 24 megaprostheses (23%) 7 APC (13%), 15 Intercalary Grafts (18%) 12 Osteoarticular Grafts (24%) .
Along the years the indication for megaprostheses remained stable in percentage with a increasing role for customized expandable devices. Indication for osteoarticular grafts progressively declined while APCs improved their efficiency in reconstructing also very small joints and represented in the last five years the 27% of the limb-salvage procedures in this age.
Conclusions: Limb-salvage surgery in children is confirmed to represent a tough challenge. The revision rate is high during the skeletal growth and further surgeries are usually needed to face the final limb length discrepancy. MBAs allow custom reconstructions with unique biologic and biomechanic properties, particularly helpful in restoring the bone stock lost in growing patients due to tumor resection. In this series, more than half of the limb salvage procedures in children involved the use of MBA, evidence of the safe strong role that bone banking can play in limb-sparing reconstruction of young oncologic patients.

Keywords : bone sarcomas, children, bone reconstruction
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Alveolar soft part sarcoma of the extremities: Important role for surgery despite high incidence of metastatic disease in a series of 21 patients.

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Submitted by : Michael Parry the 2016-02-21 21:14:37
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Introduction: Alveolar soft part sarcomas are rare tumours usually arising in the extremities, with on the whole a poor prognosis. Tumours often arise deep to the fascia and can metastasise even many years after the initial diagnosis. Few series of patients have been published in the medical literature. We report the outcome of 21 patients with alveolar soft part sarcoma of the extremities diagnosed between 1990 and 2015.
Patients and Methods: The study comprised a retrospective analysis of a population of 12 male and 8 female patients, identified from the prospectively maintained institutional database of a single unit. All had subfascial tumours, 14 in the lower extremities and 7 in the upper extremities. Median age at diagnosis was 23 years and mean follow-up was 8 years. Survival was estimated using the Kaplan-Meier method, and the log-rank test was used to compare survival distribution between groups with a p-value of ≤0.05 considered significant.
Results: The most common symptom at presentation was that of a painless mass (18 of the patients). Median duration of symptoms was 7 months. 13 patients were diagnosed with metastatic disease, 10 of whom had metastases at diagnosis. The lungs and brain were the most common sites for metastases. The 5-year overall survival rate was 63%. Patients that were treated surgically had a superior overall survival (p≤0.001). All primary resections had clear margins and there were no local recurrences. Surgical excision of metastases conferred a survival benefit (p=0,011). Radiotherapy and chemotherapy had no significant effect on event free survival. Median survival after the diagnosis of metastatic disease was 5 years.
Conclusion: Alveolar soft part sarcomas of the extremities are rare tumours, usually presenting as painless, deep-seated masses, often with a long duration prior to presentation. Surgery has a critical role in management, and complete resection is associated with an improved prognosis and low risk for local recurrence. Metastases are common. Although prognosis is generally poor, patients may survive for many years despite the presence of metastases, and surgical excision of metastatic foci appears to be beneficial. The role of adjuvant radiotherapy and chemotherapy remains to be proved.

Keywords : Alveolar soft part sarcoma, margin, surgery
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Proximal femur recostruction with allograft-prosthetic composite after tumor resection: a review of 29 cases

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Introduction

Tumor resection or complex revision total hip replacement frequently leads to severe proximal femur bone loss. In these cases, the reconstruction can be achieved with either a modular prosthetic replacement or an allograft-prosthesis composite (APC). In particular, APC reconstruction can restores bone stock and provides a biological reinsertion for abductor muscles and ileopsoas, but is theoretically vulnerable to complications associated with large segmental allografts.

Patients and Methods

A consecutive case series of 29 patients (M/F: 16/13; mean age: 33 years, range 4-77), who performed proximal femur reconstruction with APC after tumor resection between 1996 and 2015, was retrospectively reviewed. The diagnoses included 22 primary malignant tumors, 5 primary benign tumors, and 1 metastatic disease. In 21 patients (group 1) reconstruction consisted in long-stem revision prosthesis (n=14) or megaprosthesis and suspended allograft (n=7); the stem was cemented (n=10) or uncemented (n=10) in the host femoral shaft, in one case it was a total femur reconstruction. In the remaining 8 patients (group 2) a conventional prosthesis cemented in the allograft with or without bypassing the diaphyseal osteotomy and plate fixation was used. In all patients host tendons were sutured to the tendinous insertion of the allograft and no supplementary grafts were used. Average resection length from the tip of great trochanter was 15 cm (range 6-29), in one case the resection included total femur.

Results

At an average follow-up of 76 months (range 1-237), 16 patients were disease free, 5 were alive with metastasis and 4 died of disease. Four patients showed no evidence of disease after treatment of local recurrence or metastatic lesion. Overall APC survival was 85,9% at 5 years and 75,2% at 10 years. Three APC failed (10,2%) at the average of 55 months (range 31-88) as a result of two loosening and allograft resorption (all in group 1), and one fracture (group 2). In two cases a megaprosthesis was substituted, in one a new APC was performed. Two patients experienced nonunion with mobilization of fixation (all in group 2), one was treated with replacement of internal fixation and autologous bone grafting, the other was not operated for metastatic progression. A frequent late complication was allograft resorption (n=7), however it didn't influence implant stability in any case. Only one fracture of greater trochanter was observed, treated by simple rest. We observed two acetabular component loosening, treated with surgical revision without implant removal, and one sovracetabular resorption waiting for revision. One dislocation of the prosthesis occurred. One patient presented a wound dehiscence with superficial infection, treated with surgical revision. No deep infections were detected. Average MSTS functional score with a minimum follow-up of one year, was 24 points (range 13-29).

Conclusion

In case of resection of abductor muscles in the proximal femur, APC reconstruction appeared to be an effective procedure, with an acceptable rate of complications and satisfactory long-term functional results. Despite possible partial resorption of the graft, functional activity is usually preserved also in long-term follow-up.

Keywords : Proximal femur, allograft-prosthesis composite
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Results of segmental reconstruction of the femur with diaphyseal implant

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Submitted by : Burkhard Lehner the 2016-02-22 23:56:41
Category : Others
Typology : Communication orale / Oral communication
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Introduction:
Most bone tumors are located near the joints but some are restricted to the diaphysis. After resection biological reconstructions and intercalary implants are possible solutions. To investigate the results of a diaphyseal implant we observed in a retrospective study the patient group in our hospital.
Material and methods:
in 15 patients an intercalary implant (MUTARS Implantcast) was used to reconstruct a bone defect after resection of bone tumor. Median age was 56 years.Results were followed up according oncological outcome, functional outcome, survival rates and complications.
Results:
33% of the patients already presented a pathologic fracture. Length of the resected bone segment after en bloc resection was 15 cm in average. 67% were implanted using cemented stems. In 13% a periprosthetic infection occurred. In 7% local recurrence and in 27% aseptic loosening could be observed. Oncologic outcome was NED in 54%. Enneking score was 70.6%. Survival of implant was 54% at 60 months.
Discussion:
Intercalary implant showed good functional outcome with a tolerable complication rate. Aseptic loosening is still a major problem however.

Keywords : diaphyseal implant, femur reconstruction, bone defect of femur
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Variation in Management of Metastatic Humeral Fractures

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Submitted by : Stein Janssen the 2016-02-22 10:00:14
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Authorisation to disclose : Yes/Oui

Introduction and Objectives: Metastatic humeral fractures are treated by trauma surgeons, general orthopaedic surgeons, and orthopaedic oncology surgeons. Many factors (e.g. tumor type) are considered when deciding upon treatment. It is unclear how surgeon characteristics (e.g. subspecialty training, years in practice) and patient characteristics (e.g. tumor type, life expectancy) relate to the decision for specific treatment options. We aimed to evaluate: (1) if there was a difference between orthopaedic oncology surgeons and trauma surgeons in addressing metastatic humeral fractures, and (2) what patient characteristics guide the decision for treatment.
Methods: One hundred sixty surgeons participated in this cross-sectional survey study; 77 (48%) were orthopaedic oncology surgeons (Group A). The remainder (Group B) were predominantly trauma surgeons (46% [73/160]). All participants evaluated 24 fictional case scenarios of metastatic humeral fractures including radiographs. Scenarios varied with respect to: tumor type (breast carcinoma, renal cell carcinoma, and lung carcinoma), life expectancy (less than 3 months, more than 3 months), fracture type (pathological fracture, impending fracture), and anatomical location of the metastatic lesion (proximal humerus, diaphyseal humerus). Participants were subsequently asked for their treatment recommendation: intramedullary nailing, endoprosthetic reconstruction, plate-screw fixation, or nonoperative management.
Results: Among the 160 participants, 148 (93%) were men, and the mean years in practice was 15 (±9.2); most participants were from North America (49%) and Europe (38%). Intramedullary nailing was the most commonly recommended treatment (58%), followed by nonoperative management (22%), plate-screw fixation (14%), and endoprosthetic reconstruction (6.0%). We found a difference between orthopaedic oncology surgeons (Group A) and other subspecialties (Group B) in recommendation for specific treatments: intramedullary nailing was less often recommended by orthopaedic oncology surgeons (53%) compared to other subspecialties (62%) ($p = 0.024$); while endoprosthetic reconstruction (orthopaedic oncology surgeons: 8.7%, other subspecialties: 3.6%, $p < 0.001$) and plate-screw fixation (orthopaedic oncology surgeons: 20%, other subspecialties: 9.6%, $p = 0.002$) were more often recommended by orthopaedic oncology surgeons compared to other subspecialties; there was no difference in recommendation for nonoperative management between both groups (orthopaedic oncology surgeons: 19%, other subspecialties: 25%, $p = 0.052$). Recommendation for specific treatments varied based on tumor type, life expectancy, and location of the metastatic lesion. However, recommendation for treatment did not differ based on the type of fracture (impending versus pathological fracture).
Discussion/Conclusion: There is substantial variation in management of metastatic humeral lesions among surgeons. Our findings support the need for studies comparing different treatment options.

Keywords : humerus; metastatic disease; cancer; pathological fracture; variation
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CARBON ION RADIOTHERAPY IN PATIENTS WITH SACRAL BONE TUMORS

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Submitted by : Carmine Zoccali the 2016-02-12 16:35:26
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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INTRODUCTION: Sacral bone tumors have been one of the most challenging diseases for multidisciplinary oncological approach. The purpose of this work is to evaluate the preliminary results of high-dose radiation treatment using carbon ion therapy, alone or combined with chemotherapy, in patients with unresectable radioresistant bone tumors.

PATIENTS AND METHODS: From September 2013 until today 5 patients observed at Regina Elena National Cancer Institute (Rome) and affected by various histotypes of malignant bone tumors of the sacrum were treated with CIRT as definitive local treatment at CNAO (Pavia). The patients were considered unresectable or resectable but with disabling sequelae after orthopedic surgical evaluation. Patients characteristics were as follows: male/female: 3/2, median age: 50 years (range: 27-66), hIstotypes: chordoma (3 patients), mesenchymal condrosarcoma (1 patient), grade 3 condroblastic osteosarcoma (1 patient). Three patients with chordoma were treated with carbon ion radiotherapy alone. Two patients were treated with chemotherapy as “neoadjuvant” treatment before carbon ions radiotherapy. Chemotherapy regimen was VAI (Vincristine/Adryamicin/Ifosfamide) for mesenchimal condrosarcoma; Methotrexate, Adryamicin and Cisplatin-MAP for osteosarcoma. All patients were treated with carbon ion radiotherapy using active scanning beam delivery system at CNAO. The total dose was of 70.4 Gy equivalents (GyE) in 16 fractions for chordoma, 78 Gy equivalents (GyE) in 16 fractions for mesenchimal condrosarcoma and osteosarcoma starting two weeks after chemotherapy. To assess preliminary results concerning efficacy and toxicity of carbon ion particle therapy, we evaluated early toxicity during, at the end and within 90 days after radiotherapy (RT). Patients were also followed up for late toxicity and radiologic response.
RESULTS: Best response to carbon ion radiotherapy was stabilization of disease for the three patients affected by chordoma with a progression-free survival and overall survival of 28+, 22+ and 6+ months. The patient with condroblastic osteosarcoma was treated with carbon ion radiotherapy as local treatment in april 2015 after neoadjuvant chemotherapy with MAP. The treatment was followed by adjuvant chemotherapy until october 2015 and a total body FdGPET performed in october 2015 documented a metabolic complete response. Progression-free survival from carbon ion radiotherapy is 9+ months Evaluation of response is actually ongoing in the patient with mesenchymal condrosarcoma. In all patients, few CTCAE v 4.0 G1-G2 side effects were observed. The acute toxicities included neuropathy and skin erythema. Improvement of pre-existing neurological symptoms was observed in 2 patients with sacral chordoma and 1 patient with osteosarcoma .
CONCLUSIONS: Carbon ions radiotherapy shows favorable results and acceptable toxicities alone or combined with chemotherapy, offering a promising alternative to surgery for selected cases of patients with unresectable sacral bone tumors.

Keywords : chordoma, Radiotherapy, Carbon Ion, sacral tumor
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Patient specific instrumentation for resection of pelvic tumor ; clinical, pathological and imaging evaluation

Abstract ID : 1237
Submitted by : Francois Gouin the 2016-02-12 19:16:12
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
Status : Validated
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Background :
Pelvic bone tumor resection is challenging due to complex geometry, limited visibility and restricted working space of the pelvis. Accurate resection in safe margin is required to reduce the risk of local recurrence.
Computer-assisted preoperative planning and intraoperative navigation technologies have already demonstrated the feasibility of achieving clinically adequate (tumor-free) resection margins.
Patient-specific instrumentation (PSI) technology has been developed and adapted to bone tumor surgery as a cheaper and less time-consuming alternative to intraoperative navigation. A recent experimental study has assessed an equivalent value-added of both navigation and PSI in terms of achieved surgical margins during simulated bone tumor resections on plastic pelves.

Question / Purposes:
The aim of this study was to assess the feasibility of using PSI for pelvic bone section for bone tumor resection, to evaluate bone margins obtain with PSI and short term follow-up of patients operated with this device.

Patients and methods:
Single center prospective case series of patients whom for a pelvic bone resection was indicated. Inclusion criterion was primary malignant bone tumor from periacetabular to sacral area. The bone surface adaptation has been rated per-operatively using a semi quantitative 4-level scale (from excellent to ambiguous). Resection margins were assessed according to UICC rating RO, R1, R2. When the patient underwent a routine post-operative CTscan, data have been exploited to quantify the accuracy of achieved cut planes against the pre-operative cut planes. Patients were followed-up clinically and by MRI (every 6 months).

Results:
17 patients were operated with PSI for bone tumor resection of the pelvis over 3.5 years. 10 had chondrosarcomas, 3 Ewing, 2 osteosarcoma and 1 leiomyosarcoma and 1 soft tissue sarcoma with iliac bone extension. During the same period 6 patients were eligible but not included because of financial or logistical issue. Positioning of the guide (20 guides for 17 patients, 2 patients have had 2 guided bone section) was rated excellent in 10 cases, good in 6, difficult in 2 and ambiguous in 1. Error in safe pre-operative planned margins (on post-operative CTscan) ranged from 0.1mm to 3.4mm. Bone margins were R0 in all cases except one (morcellized resection due to severe bleeding), and R1 in soft tissues for 3 patients. For 14 patients with at least 12 months of follow-up); 3 patient died, 2 from disease (no local recurrence) and 1 from unrelated cause. 1 patient recurred locally (R2 resection at 30 months) and 1 recurred in soft tissue (R1 soft tissue resection). None of the remaining 9 patients have local recurrence (mean follow-up is 27.8 months (12-46).

Conclusion:
PSI need to undergo accurate pre-operative planning on MRI and CTscan at least 3 weeks before surgery. It has been considered as very easy and undoubtedly to place on bone surface in most of the cases and really convenient for the surgeon to mobilize the tumor during the operation. Bone clear margins were obtained in all cases (except R2 resection not due to the device) and no bone recurrence occurred at the moment.

Keywords : pelvic tumour, PSI, computer, margins, resection
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Single Step Pelvic Reconstruction After Complex Tumor Resection With A Patient-Matched 3D-Printed Trabecular Titanium Implant – A Case Report

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Submitted by : Christophe Kurze the 2016-02-14 18:38:15
Category : Pelvic bone tumours
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Introduction
Pelvic bone tumor surgery remains one of the most challenging fields in orthopedic oncology. Today, pelvic bone tumor surgery usually aims at limb preservation and restoration of a functional hip joint. Recently, 3D-printed patient-specific trabecular titanium implants have emerged as an option to reconstruct the pelvis and to restore the hip joint at its anatomical position.
We report the case of a desmoid tumor of the pelvis treated with a modified periacetabular resection (type 2/H2) and reconstruction of the pelvis with 3D-printed trabecular titanium implants.

Methods
A 24-years old female presented with an atraumatic acute onset of right hip pain. On plain radiographs an osteolytic lesion involving the entire superior pubic ramus and the anterior column was found. On MRI and CT scans, the tumor was found to infiltrate the hip joint. CT-guided biopsy confirmed a desmoid tumor of bone. Interdisciplicary tumor board discussion advocated for en-bloc resection without (neo)-adjuvant treatment. To reconstruct the pelvis a patient-specific implants was designed based on 3-dimensional bone models created from pre-operative high-resolution CT scans. The implant was fabricated from medical grade Ti6Al4V using additive layer manufacturing techniques.

Results
The patient underwent en-bloc tumor resection involving modified periacetabular resection (type 2) with preservation of the posterior column and pertrochanteric resection (type H2) of the hip joint. To achieve adequate exposure and margins, a pararectus approach was combined with a lateral approach to the hip via trochanteric flip osteotomy. The bony resections were performed with the aid of patient-matched cutting blocks. Reconstructions of the pelvis and the hip joint were performed during the same surgery. The patient-specific implant was fixed to the host bone with modular plates and screws. Standard total hip arthroplasty implants were used (cemented liner, cementless stem, 32-mm ceramic head) to restore the hip joint. Surgery time was 610 minutes; blood loss was 2500 ml. There were no intraoperative complications noted. Primary wound healing was uneventful in both cases. The patient was mobilized with partial weight bearing for 16 weeks. 6 months after the surgery, the patient is ambulating without crutches, has returned to normal activities of daily living, and has resumed her occupational activity. There is no evidence of a local recurrence of the desmoid tumor.

Conclusions
Patient-matched trabecular titanium implants seem to be very useful to reconstruct large pelvic defects after bone tumor resections. The use of patient specific cutting blocks during tumor resection ensures adherence to the planned surgical margins and provides a precise fit of the implants with good primary stability. The trabecular nature of the implants facilitates ingrowth of the host bone into the implants for long-term stability. However, the time frame for the design and the 3D-printing process is approximately 6 weeks, restricting the use of the implants to slow growing tumors and tumors requiring pre-operative chemo- or radiotherapy. More data will be needed to evaluate the long-term performance of this new generation of implants.

Keywords : 3D-Printed Implant, Hemipelvectomy, Patient-Matched Implant, Pararectus Approach, Pelvic Tumor
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Bone Marrow Biopsy in initial staging of Ewing Sarcoma: experience from a single Institution

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Submitted by : Marilena Cesari the 2016-02-15 15:22:28
Category : Ewing Sarcoma
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Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Ewing sarcoma (ES) is more frequent in adolescent and children, representing the second most common bone tumour in this group of patients. Staging for paediatric ES usually include imaging and bone marrow biopsy (BMB).

Patients and methods: A retrospective analysis was carried out at our Institution. Clinical charts, imaging and histology of patients with diagnosis of ES and in which bone marrow biopsy was performed, for the initial staging work-up, at Rizzoli Institute between 1998 and 2014 were reviewed.

Results: The series included 493 cases of ES of the bone. Metastases at diagnosis were found in 123 patients (25%), while the remaining 370 had localized disease. Eleven out of 493 patients had positive bone marrow biopsy (2.23%). In this group, primary site of disease was pelvis in 5 cases and inferior limb in 6 (foot in 2 cases, femur in 3 and tibia in 1). All but 1 had metastases detected at the initial work-up staging with imaging assessment (thoracic CT scan, whole-body bone scan and/or PET/CT scan): 7 patients presented with bone metastases, 3 patients had bone and lung metastases. Only 1 patient with Ewing sarcoma of foot (second metatarsus), was found to have bone marrow involvement with negative imaging evaluation. For this patient skeletal status was studied with whole-body bone scan and no PET/CT was performed, since this technique was not routinely used at the time of diagnosis (2003). Among the 11 patients with positive bone marrow biopsy, one patient was alive with no evidence of disease 8 years from diagnosis, 7 patients died of disease, 1 patient died because of treatment toxicity, in 2 patient second line chemotherapy were ongoing 13 months from diagnosis.

Conclusions: BMB represents an invasive and stressful procedure, often requiring anesthesia or sedation. On the basis of our data, we would like to suggest to reconsider its effective role in initial staging work up for patients with ES who do not have signs of metastases with modern imaging techniques. In metastatic disease, the assessment of bone marrow status may retain some usefulness in identifying a very high-risk group of patients who could have benefit from different strategies of treatment.

Keywords : Ewing Sarcoma, bone marrow biopsy, staging
Authors :
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Prognostic impact of treatment delays in Ewing sarcoma (EwS) in the Euro-EWING99 trial

Abstract ID : 1300
Submitted by : Dimosthenis Andreou the 2016-02-14 18:58:47
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
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Introduction: Long-term survival in EwS patients is possible due to multimodal treatment approaches. A prerequisite is a close cooperation among physicians of all involved clinical disciplines. If patients are not treated in a sarcoma center, the logistics of this cooperation may lead to treatment delays, the prognostic impact of which remains unclear.
Methods: Retrospective analysis of the files of 692 patients with previously untreated EwS of the extremities, the pelvis and the chest wall registered in the Euro-EWING99 trial between 1998 and 2009. Data from centers in Germany, Austria, Belgium, the Czech Republic, the Netherlands and Switzerland were collected. Only patients who presented with localized disease and underwent surgical treatment of the primary tumor were included. The primary outcome was event-free survival (EFS), defined as the interval between diagnostic biopsy and first event (disease progression, local recurrence or metastasis). A secondary outcome was overall survival (OS). Receiver operating characteristic (ROC) curves were used to analyze the influence of various intervals on EFS and OS.
Results: With a median follow-up of 4.8 years in all patients and 5.9 years in survivors, EFS was 67.3% at 5 years and OS 73.0%. The median interval between diagnostic biopsy and begin of systemic chemotherapy amounted to 14 days and was not associated with EFS (area under the curve (AUC) 0.506, p=0.797) or OS (AUC 0.509, p=0.721).
In 485 patients surgical treatment was performed after exactly 6 cycles of neoadjuvant chemotherapy, according to the protocol. The median interval between start of the first cycle of chemotherapy and surgery (startCTX-SURG) in these patients amounted to 141 days and was significantly associated with EFS (AUC 0.566, p=0.016), but not OS (AUC 0.546, p=0.109). ROC curve analysis showed that the optimal cut-off to predict an improved EFS was 146.5 days. Patients with a startCTX-SURG interval of <146.5 days had an EFS at 5 years of 69.8%, compared to 56.4% in patients with an interval of >146.5 days (p=0.006), and an OS of 74.3% compared to 65.6% (p=0.048).
Finally, the median interval between surgery and start of adjuvant chemotherapy (SURG-ADJ) was 17 days. ROC curve analysis showed a significant association with EFS (AUC 0.582, p=0.004) and OS (AUC 0.560, p=0.042), with an optimal cut-off at 16.5 days. Patients with a SURG-ADJ interval of <16.5 days had a 5-year EFS of 71.2%, compared to 60.9% in patients with an interval of >16.5 days (p=0.007), and a 5-year OS of 79.0% compared to 65.9% (p=0.030).
Conclusion: The interval between diagnostic biopsy and begin of systemic chemotherapy does not appear to influence OS or EFS in EwS patients. However, shorter intervals between start of neoadjuvant chemotherapy and surgery, as well as surgery and start of adjuvant chemotherapy in patients receiving 6 cycles of neoadjuvant treatment seem to be associated with an improved EFS and OS.

Keywords : ewing sarcoma, treatment intervals, overall survival, event-free survival, prognostic factors
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Long-term outcome in patients with pelvic Ewing sarcomas

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Submitted by : Andreas Ranft the 2016-02-22 21:46:54
Category : Ewing Sarcoma
Typology : Communication orale / Oral communication
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Authorisation to disclose : Yes/Oui

Background: With improved survival rates of patients with Ewing sarcoma the quality of long-term survivorship needs to be addressed. The pelvis is one of the most common primary sites for Ewing sarcomas, and comprises 1/5 of all primary sites. While it remains the most unfavorable tumor location in terms of survival, data relating to long-term outcome of survivors are still limited. In this study, general recovery and restitution of function following intensive bone tumor treatment in pelvic Ewing sarcomas were analysed by assessing the clinico-functional outcome and physical activity using self-reporting and objective measurement tools.
Methods: Long-term outcomes of 125 pelvic Ewing sarcoma survivors, diagnosed between 1980 and 2009 and registered in the consecutive CESS 81, CESS 86, EICESS 92, and EURO-EWING 99 trials, were assessed using the TESS, SF-36, BSI, and RSES questionnaire scales, and the accelerometric StepWatch Activity Monitor (SAM). To compare results with healthy subjects, 61 non-random peer controls were selected. Median observation time was 12.5 years from primary diagnosis (range 3.7-30.6).
Findings: Absolute values from the questionnaire scores indicated no major clinical findings in former pelvic Ewing sarcoma patients. Compared to controls, unfavourable outcomes were however seen on physical-based TESS, PCS (SF-36) (d>-.50) and BSI-S scales (d=.46) (P<.001), compared to mental-based MCS, BSI-A, BSI-D, RSES scores (d<.35). Former patients were less active than the control group (9304 vs. 12053 steps per day; d=-.75; P<.001), and on average did not reach the recommended level for active life-styles (>10000 steps). Comparing local therapy modality, scores for SAM, TESS, PCS were 10368, 95.0, T=52.2 for patients treated with surgery (N=14), 8687, 89.3, T=45.7 in patients with combined modality treatment (N=71), and 10072, 92.9, T=48.5 for patients with definite radiotherapy (N=39) (P=.164; P=.073; P=.064). Analyses of outcome in different pelvic sites are to follow.
Interpretation: Survivors of primary pelvic Ewing sarcoma exhibited moderately reduced self-reported, mainly physical-based, outcome scores compared to controls; this was confirmed by an objective measurement of reduced physical activity. Continuous long-term observation will be important in order to identify disease-specific prognostic factors for these patient-orientated outcomes, and to reduce potential late effects of treatment.
Funding: Supported by BMBF/DLR 01ER0807 and DKH 108128

Keywords : Ewing sarcoma, long-term outcome, pelvis, step measurement, SF-36
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THE VALUE OF PERCUTANEOUS BIOPSY IN THE APPROACH TO MUSCULOSKELETAL TUMOURS

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Submitted by : João Esteves the 2016-02-23 16:52:36
Category : Others
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INTRODUCTION: In specialized centres, where pathologists integrate all the clinical and image information, core needle biopsy (CNB) is considered the best procedure to reach an accurate diagnosis. It is a minimally invasive technique, performed in an outpatient basis without general anaesthesia or hospitalization, as well as having a much lower cost. The purpose of this study was to evaluate the diagnostic accuracy of CNB, and to analyse to which extent this method enables the initiation of treatment, clarifying its role in addressing musculoskeletal tumours.
METHODS: Between January of 2003 and December of 2013 (11 years) 456 patients underwent CNB. All procedures were performed by the same team: an orthopaedic surgeon for bone lesions and a radiologist for the soft tissue. Samples were analysed by 2 pathologists. There were 222 males and 234 females with an average age of 51,6 years (2-90). All CNB were performed under image guidance. All soft tissue lesions (n=92) were done under ultrasonography image control. Fluoroscopy or CT scan were used to guide bone biopsies (n=364). A diagnosis was considered to be accurate when it was confirmed by incisional biopsy, surgical specimen or ulterior clinical and imaging evaluation as in some benign tumours, metastases and hematopoietic lesions no histological confirmation is needed. The minimum follow up was 2 years. Exclusion of disease was included in the group of diagnosis.
RESULTS: With CNB 431 diagnosis were possible (94,5%). Diagnoses were: 86 metastases, 95 primitive malignant tumours, 127 benign tumours, 43 hematologic diseases, 32 infections, and in 48 cases there was no disease. Accuracy rate was 99,3%. Regarding determining malignancy CNB had 99,6% sensitivity, 100% specificity, 100% positive predictive value and 99,5% negative predictive value. Among the 25 inconclusive samples 19 (76%) were benign lesions and 6 (24%) were malignant.
There were 3 wrong diagnoses. In one of them a malignant tumour was wrongly diagnosed as a benign one. In the other 2 lesions, CNB pointed a correct benign diagnosis but it was not accurate.

DISCUSSION/CONCLUSION:
The high diagnostic yield and accuracy of CNB show the reliability of this technique in the diagnosis of all type of musculoskeletal lesion. In 94,5% of the cases, the treatment was initiated based on the biopsy diagnosis. Only in one case the malignancy of the lesion was misdiagnosed.
If adequate tissue is sampled, CNB precludes open biopsy and can be used for rational treatment planning. Regarding accuracy (99,3%) our result are higher than data in recent literature (73-93%). This is due to the experience in selecting the lesions to the procedure, the nature of the lesion and its best region to biopsy, and the strict collaboration with the pathologist.
If the diagnosis is doubtful or if there is an inconsistency with image the procedure will be easily repeated (no morbility). The percutaneous biopsy is presently the best and most appropriated approach when facing an unknown bone or soft tissue lesion.

Keywords : biopsy; bone tumour; soft tissue tumour; sarcoma
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Evaluation of the diagnostic accuracy of open versus closed image-guided biopsies in musculoskeletal lesions. A retrospective review of 1149 biopsies performed on 1048 patients.

Abstract ID : 1427
Submitted by : Kyriakos Papavasiliou the 2016-02-21 22:24:34
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives
Biopsy is considered as a milestone in the diagnosis and treatment of musculoskeletal lesions. For most such tumours, appropriate treatment cannot be initiated until definite tissue diagnosis is available. Closed core-needle biopsy under Computed Tomography or ultrasound guidance seem to be the gold standard, since it is much easier to perform than the open, is well-tolerated, secures proper needle position, is accompanied by less morbidity and tumor cells spillage and costs less. Open biopsy on the other hand provides the pathologist with more tissue and may lead to more secure diagnosis. Aim of this case-series study was the review of all biopsies (closed and open) performed at our department in patients suffering from soft-tissue and bone tumours and the evaluation of the diagnostic accuracy of the closed procedure.
Methods
We retrospectively reviewed the case notes of patients with musculoskeletal lesions who underwent closed or open biopsies during the last 12 years. The necessity for an additional open biopsy following a closed one, the validation of the closed biopsy's result with that of the definite pathology report following the excision of a lesion and the complication and morbidity rates accompanying closed and open biopsies were registered and analyzed.
Results
Between December 2003 and October 2015, a total of 1149 biopsies were performed on 1048 patients (572 female and 476 male) suffering from 261 benign and 771 malignant (357 primary and 414 metastatic) musculoskeletal lesions. Sixteen patients were suffering from Giant Cell Tumour. In all 1048 patients a closed biopsy under image guidance was initially performed. In 789 cases CT-scan guidance was used; the remaining 259 were performed under US guidance. In 101 cases (9.6%) an open biopsy was deemed as necessary in order to reach a secure diagnosis, due to the insufficient quantity of tissue obtained during the closed biopsy. In 845 patients, the tumour was operatively excised or underwent curettage. The final pathology report of the excised specimen was in accordance with the initial report which was based on the biopsy tissue in 808 cases; in the remaining 37 cases (4.4%) there was a discrepancy between the two reports. In 33 out of these cases a closed biopsy had been performed. There were two cases of post-biopsy haematomas and none of infections in patients who had undergone closed biopsies. One case of a painful neuroma was developed following a closed biopsy of a benign tumour, which eventually necessitated its operative excision. Eleven cases of mild postoperative hematomas also developed. In another case an extraosseous migration of a primary aneurysmal bone cyst following CT-guided core needle biopsy was developed, which also required surgical intervention (marginal excision).
Discussion/Conclusion
Closed image-guided core needle biopsy seems to be the gold standard method to accurately and efficiently obtain tissue for pathologic examination for both benign and malignant lesions (both primary and metastatic). When performed by experienced radiologists, this method is accompanied by very high success rates, less morbidity than the open biopsy and very high rates of diagnostic accuracy.

Keywords : open biopsy, closed image-guided biopsy, bone, soft-tissue
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“Biopsy track seeding: histopathological confirmation and relevance in clinical practice”

Abstract ID : 1168
Submitted by : IRENE BARRIENTOS-RUIZ the 2016-02-09 11:53:51
Category : Margins in Sarcoma
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Background: The biopsy is the final step in the diagnosis of sarcomas. It is commonly accepted in musculoskeletal oncology that incorrectly performed biopsy could change the prognosis of the disease because it is considered contaminated tissue that should be resected together with the tumor at the time of the oncologic surgery. To our knowledge the incidence of contamination of the biopsy track or the factors that affects the cells seeding are not very well described in the medical literature. Methods: This is a retrospective study with prospectively collected data from 180 sarcomas cases treated in a single center. The objective is obtaining confirmation from an histopathological point of view of the contamination of the biopsy tracks and to detect possible factors that can affect that seeding. We have also studied the clinical relevance of the contamination in the local prognosis of the patient. Results: Of the 180 biopsies studied, 21 biopsies were contaminated. 32% of the open biopsies and 0.8% of the percutaneous core needle biopsies had cell seeding ($p<0.001$). The survival time, free of local recurrence, was longer in patients referred before the biopsy ($p=0.02$) and without contaminated tracks ($p<0.001$). Conclusions: The sarcoma cells can affect both percutaneous and open biopsies, but in our series percutaneous core needle biopsy path had lower contamination rate and higher survival without local recurrence.
Level of evidence III

Keywords : Hemipelvectomy, cone prosthesis, sarcoma
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Rotationplasty in today's era – Does it have a role ?

Abstract ID : 1108
Submitted by : Ajay Puri the 2016-02-01 12:02:43
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: One of the preferred treatments for lower limb tumors especially in children with growth potential is rotationplasty. Rotationplasty is also a very useful option in large tumors or lesions which have not been appropriately treated at index presentation where conventional limb salvage may not be possible. The aim of the study was to assess the outcomes of patients treated with rotationplasty.
Materials & Methods
A retrospective audit from a prospectively maintained data base identified 122 non metastatic bone tumor patients that underwent rotationplasty between January 2000 to December 2013. There were 92 males and 30 females. The most common lesion was osteosarcoma, accounting for 99 patients. There were 13 cases of Ewing's sarcoma, 7 soft tissue sarcomas, 3 giant cell tumor and one low-grade bone sarcoma. The age range was from 4 to 54 years (median 14 years). Only 38 of these patients were 10 years or younger. 9 resections were for the entire femur, 91 involved the distal femur and 22 the proximal tibia.
Only 6 of 67 patients in whom data for vascular continuity was available needed a vascular resection and anastamosis. In the others, vascular continuity was not disrupted and the vessels were coiled to accommodate for extra length.
Results
The mean follow up was 36 months (range 12 months–12 years). There were 31 complications – 31: superficial infections – 10, deep infections – 2, vascular problems – 8, peroneal palsy – 6, malrotation – 1, fracture / loss of reduction – 4. Six patients ultimately had an amputation. 10 patients were lost to follow up and 17 patients died due to disease. The mean MSTS score in the study was 25 (range 19 – 28).
Conclusions:
Even in the era of metallic endoprosthesis, rotationplasty is an acceptable alternative procedure for lower limb tumors especially in children with growth potential and large tumors not amenable to conventional limb salvage.

Keywords : rotationplasty, large tumor, children
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Endoprosthetic intercallary bone reconstruction in the lower extremity after tumour resection in children and adolescence: still a challenging surgical procedure

Abstract ID : 1227
Submitted by : the 2016-02-12 11:30:50
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Intercalary defect reconstruction after tumour resection is challenging. Biological as well as endoprosthetic procedures are well established. However, influencing parameters like the age, defect site/length, additional treatment procedures like chemo and or radiotherapy do effect the individual treatment decision and in particular the reconstructions outcome in terms of function and longevity significantly. Patients and Methods: In this series we present our experiences with the endoprosthetic reconstruction of diaphyseal defects after malignoma resection in the lower extremity. 26 patients (16 femur, 10 tibia) underwent intercalary reconstruction with an intercalary implant (MUTARS Implancast®). Diagnosis was bone and soft tissue sarcoma in 22 cases and bone metastasis of malignant solid tumours in 4 cases. Mean age was 46 years. Reconstruction length was in average 18 cm for both sites. Results: Major complications occurred in 17 patients. LR (n=4) and infection (n=2) were the most serious complications leading to an amputation in 4 patients. Aseptic stem loosening (9 out of 52) was the most often seen complication that required surgical intervention. Overall reconstruction survival was 69,3% with a medium follow up of 42 months for the surviving reconstructions. Estimated 5 year reconstruction survival was 58% for the femur and 80% for the tibia, whereas extremity survival according to Kaplan-Meier was 79% respectively 40% for tibial reconstructions only. Conclusion: The use of endoprostheses for intercalary defects in the lower extremity can provide early full weight bearing, a short rehabilitation period and satisfying functional results. However, a high complication rate compromises the overall success. Aseptic stem loosening in a metaphyseal bone location is a major problem, which need to be allocated by improving the stem design and fixation techniques.

Keywords : intercallary reconstruction, bone tumours, sarcoma
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Extracorporeal irradiated bone in limb salvage surgery – A useful biological option

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Submitted by : Ajay Puri the 2016-02-15 10:18:30
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives : To assess the oncologic safety and functional outcomes of reconstruction with extra corporeal irradiated bone after resection of diaphyseal sarcomas .
Methods : Between Jan 2006 and Dec. —2013, 74 patients with diaphyseal sarcomas underwent reconstruction with extra corporeal Irradiated bone (radiated with 50 Gy) after resection. Mean age was 17.4 yrs (1 – 46 years). There were 17 females and 57 males. The bones involved were : femur 47, humerus 6, tibia 20 and ulna 1. Etiology included : osteosarcoma 39 , Ewing's 32 and adamantinoma 3 . Mean resection length of diaphyseal defect was 19 .4cms (6 – 32 cms). Based on surgeon preference various internal fixation devices were used . Morcellised allograft was used at the diaphyseal junctions in 42 cases based on surgeon preference.
Results : Mean time to union at metaphyseal sites was 29 weeks and at diaphyseal sites was 46 weeks. 25 patients needed a repeat surgery to achieve union. 3 patients had infection and ,4 developed a fracture in the ECRT bone . There were 6 local recurrences , all in soft tissue. Ultimately 7 patients had to have the radiated bone removed for various reasons. There was no difference in union times based on choice of implant for fixation. or with/without the use of bone grafts. At a median follow up of 32 months the mean MSTS score was 27 .
Conclusion: Limb salvage with extra corporeal Irradiated bone for diaphyseal sarcomas is an oncologically safe biological reconstruction option with good functional outcomes.

Keywords : biological, oncologic safety
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Vascularised fibular epiphyseal transfer for proximal humeral resections for primary bone sarcomas in children

Abstract ID : 1367
Submitted by : Jonathan Stevenson the 2016-02-17 16:33:57
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives

Preserving growth following limb salvage surgery in the paediatric patient remains a challenge in the upper limb. Growing prostheses may present high rates of complications1 or are too large to fit small children2. Vascularised autografts may provide rapid biological incorporation and the potential for growth in children. Free vascularised fibular autografts, first described in 1975,4 have comparable oncological outcomes to endoprostheses but reportedly fewer surgical complications and lower rates of revision5. We aimed to review their use following proximal humeral resection in children.

Patients and methods

Using a prospectively collected database we retrospectively identified ten patients who had undergone wide proximal humeral resection vascularised fibular autograft reconstruction with epiphyseal transfer.

All patients were diagnosed between 2004 and 2014 with primary malignant bone tumours of the proximal humerus (6 Ewing's sarcoma, 4 osteosarcoma). Mean age at diagnosis was 4.8 years (range 2-8 years) and mean follow-up period was 4.7 years (95% CI: 2.4 to 7 years). We analysed the clinical, oncological and radiological outcomes including mean annual growth.

Results

All patients were stage IIB at diagnosis and underwent neo-adjuvant chemotherapy in line with clinical protocols. At final follow-up nine of the ten patients were still alive; one patient suffered local recurrence and metastasis (both 8 months after surgery) and died a year post-operatively.

Axial growth and hypertrophy was evident in eight of the ten cases, when there was no avascular necrosis of the fibula graft. The mean annual growth was 6.4mm per annum in these eight grafts (range 3.7mm to 9.8mm). Complications included fracture (6), temporary nerve palsy (2), and avascular necrosis (2). There were no cases of infection; all fractures united with conservative management. One patient had two separate re-operations for a slipped fibula epiphysis of the fibula graft and a hemiepiphysiodesis for lateral proximal tibial epiphyseal arrest.

Conclusions

Vascularised fibula epiphyseal transfer in children younger than ten years is a reliable method of limb salvage following primary sarcoma excision of the proximal humerus. Fractures united and peroneal nerve palsies resolved but graft necrosis occurred in two out of ten cases at mean 5-years follow-up.

Keywords : paediatric, sarcoma, fibula, autograft, epiphysis
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Routes to diagnosis for sarcoma patients

Abstract ID : 1414
Submitted by : Heidi Buvarp Dyrop the 2016-02-21 17:15:12
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Sarcoma patients often experience delays before diagnosis, which may affect prognosis and surgical outcome. Most studies on this problem are performed at specialist centres. Little is known about sarcoma patients' routes to diagnosis from first symptom until diagnosis and treatment.

Methods
545 consecutive patients referred to the Danish Cancer Patient Pathway for sarcomas with a suspicion of sarcoma were included in the study. Patients were interviewed and filled out a questionnaire regarding symptoms, symptom duration, dates of first presentation and route to diagnosis. Information on dates and investigations performed were collected from patient records at local hospitals. The general practitioner (GP) also received a questionnaire concerning dates, investigations performed and presenting symptoms. Patient interval was defined as time from first symptom to first presentation to doctor, GP interval as time from first visit at GP to referral to further investigation at hospital, local hospital interval as time from referral to first local hospital to final referral to sarcoma centre, sarcoma centre interval as time from first visit at sarcoma centre to decision of diagnosis/treatment, and total interval as time from first symptom to decision of diagnosis/treatment.

Results
Of 545 patients, 170 (31.2 %) had a neoplasm (102 (18.7 %) sarcomas, 68 (12.5 %) other malignancies) and 375 (68.8 %) had benign diagnoses. For 456 patients (83.7 %) the GP was involved in the diagnostic route. Number of hospitals visited between GP and sarcoma centre was significantly higher for sarcoma patients compared to benign patients (Wilcoxon rank sum test, p=0.0001). For sarcoma patients the most frequent reason to seek doctor was pain (14.7 %) followed by a non-specific worry (11.8 %), urged to seek doctor by others (9.8 %) and seeing the doctor for something else (8.8 %). For sarcoma patients the median patient interval was 77 days, median GP interval 17 days, median local hospital interval 29 days, median sarcoma centre interval 17 days, and the median total interval from first symptom to decision of diagnosis/treatment was 176 days. Median GP interval was significantly longer for sarcoma patients (+10 days) compared to benign patients. Among all 545 patients, GP and sarcoma centre intervals was significantly shorter for patients presenting with a lump (-19 days and -4 days respectively). If a patient presented with pain the median patient, GP and total intervals were significantly longer compared to patients without pain (+40 days, +12 days and +78 days, respectively). If the GP initially suspected malignancy the median local hospital and total interval were significantly shorter (-12 days and -76 days respectively).

Conclusion
For sarcoma patients, the main part of the overall time interval from first symptom to diagnosis and treatment relates to the patient waiting to present symptoms, followed by time intervals at the local hospital. If a patient presents with a lump the GP interval is significantly shortened, and if the GP initially suspected malignancy the local hospital and total interval was shortened, which represents confounding by indication.

Keywords : Cancer Patient Pathways, routes to diagnosis, delay, symptoms
Authors :
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Risk Factors Of Symptomatic Venous Thromboembolism In Sarcoma Patients: A Japanese Prospective Multicenter Study

Abstract ID : 1452
Submitted by : Iwata Shintaro the 2016-02-22 10:11:26
Category : Others
Typology : Communication orale / Oral communication
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Patients with musculoskeletal tumors may have a higher risk of venous thromboembolism (VTE) because of vessel wall injury during surgery, venous stasis caused by immobilization after surgery, and activation of coagulation factors in malignant disease. However, no prospective studies have been undergone to prove this theory. The aim of this prospective multicenter study was to evaluate an incidence and risk factors of symptomatic VTE in Japanese musculoskeletal sarcoma patients.
Methods: VTE cohort study for sarcoma (VTECS) is a prospective observational cohort study of
patients with newly diagnosed bone and soft tissue sarcoma and planned for definitive surgery. Patients with metastatic tumor or benign/intermediate bone and soft tissue tumor, or past history of VTE were excluded from this study. Thirty tertiary musculoskeletal oncology hospitals belonging to Japanese Musculoskeletal Oncology Group (JMOG) participated in this study from April 2012 to March 2015. The endpoints of this study were incidence of symptomatic VTE within the follow-up of 6 months and risk factors of symptomatic VTE. Univariate (Wilcoxon rank sum test or chi-square test) and multivariate (logistic regression model) analysis were used to analyze the association of the incidence of symptomatic VTE and risk factors.
Results: Eight out of 803 patients were diagnosed as a symptomatic VTEs (7 deep venous thromboses and 1 pulmonary embolism) on 7 to 53 days after the surgery (median, 12 days), and the incidence was 1.0%. All clinically detected symptomatic VTEs were confirmed by CT venography or ultrasonography. Univariate analysis indicated that lower extremity (P=.042), maximum diameter over 6cm (P=.032), elevation of preoperative platelet count (P =.023), operation time longer than 5 hours (P =.026), and blood loss during surgery over 700mL (P <.0001) were significantly associated with the occurrence of symptomatic VTE, although age at diagnosis of VTE (median, 56 years old), gender (3 males and 5 females), and body mass index (median, 21.2) did not. Multivariate analysis resulted that the elevation of preoperative platelet count (relative risk, 6.59) and massive blood loss (relative risk, 9.57) were independent risk factors of increased risk of symptomatic VTE.
Conclusion: The incidence of symptomatic VTE in Japanese patients with bone and soft tissue sarcoma was 1.0%. Elevation of preoperative platelet count and massive blood loss during the surgery are new risk factors for occurrence of symptomatic VTE in those patients.

Keywords : VTE, Sarcoma, Risk factor
Authors :
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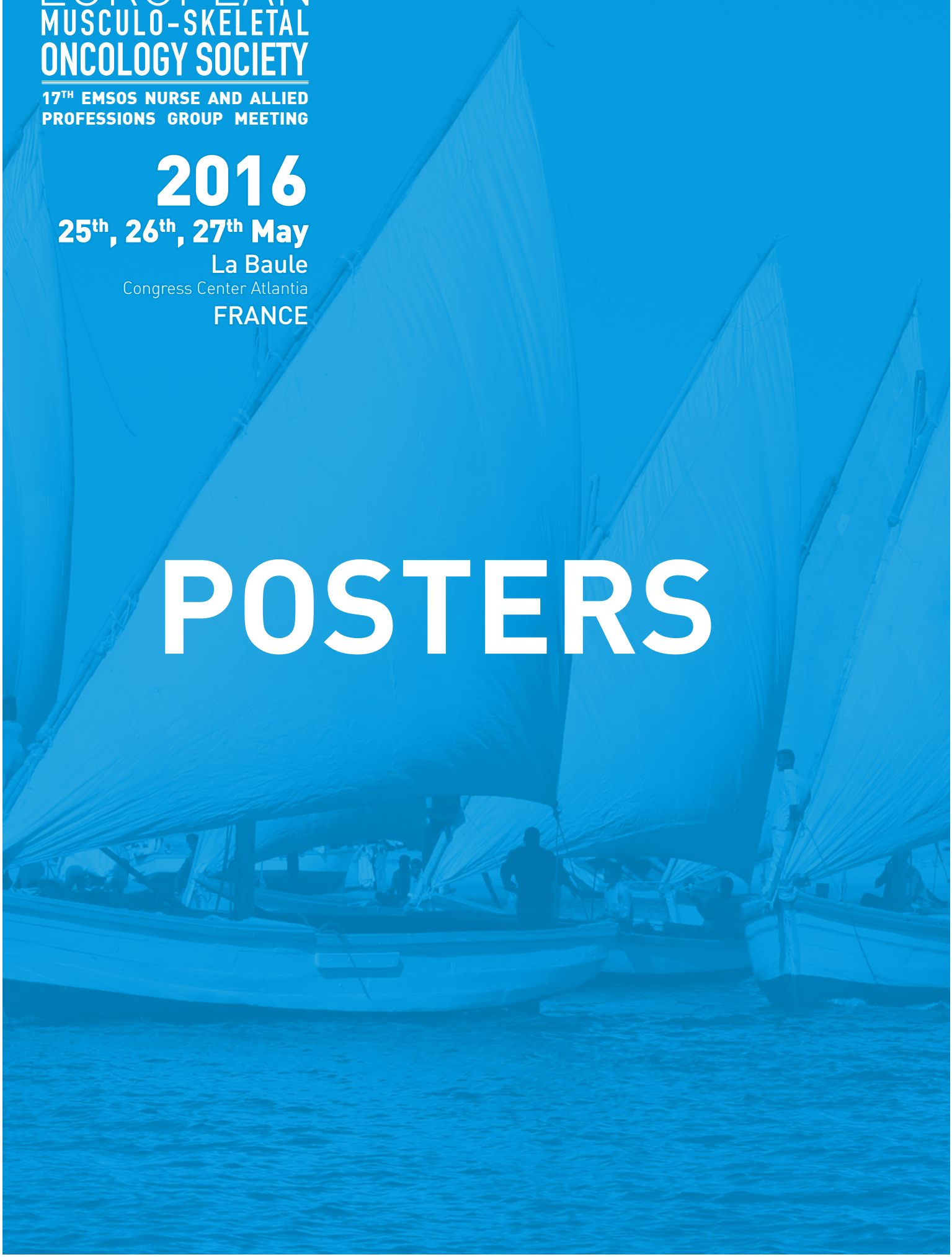

POSTERS

3D surgical planning and 3D printing – innovative technology to correct hip instability after expandable prosthesis reconstruction

Abstract ID : 1433
Submitted by : solomon dadia the 2016-02-21 23:47:50
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background
Dislocation is a common complication after proximal and total femur prosthesis reconstruction for primary bone sarcoma patients. Expandable prosthesis in children puts an additional challenge due to the lengthening process. Hip stability is impaired due to multiple factors: Resection of the hip stabilizers as part of the sarcoma resection: forces acts on the hip during the lengthening; and mismatch of native growing acetabulum to the metal femoral head. Surgical solutions described in literature are various with reported low rates of success.
Objective
Assess a novel 3D surgical planning technology by use of 3D models (computerized and physical), 3D planning, and Patient Specific Instruments (PSI) in supporting correction of young children suffering from hip instability after expandable prosthesis reconstruction following proximal femur resection. This innovative technology creates a new dimension of visualization and customization, and could improve understanding of this complex problem and facilitate the surgical decision making and procedure.
Method
Two children, both patients with Ewing Sarcoma of the left proximal femur stage-IIB, ages 3/5 years at diagnosis, were treated with conventional chemotherapy followed by proximal femur resection. Both were reconstructed with expandable prosthesis (one at resection and other 4 years after resection). Hip migration developed gradually during lengthening process in the 24m follow up period.
3D software (Mimics, Materialise, Belgium) were used to make computerized 3D models of patients' pelvises. These were used to 3D print 1:1 physical models. Custom 3D planning software (MSk Lab, Imperial College London) allowed surgeons visualizing the anatomical status and assess of problem severity. Thereafter, osteotomies planes and the desired position of acetabular roof after reduction of hip joint were planned by the surgeons. These plans were used to generate 3D printed PSIs to guide the osteotomies during shelf and triple osteotomy surgeries. Accuracy of planning and PSIs were verified with fluoroscopy and post-op X-rays, by comparing cutting planes and post-op position of the acetabulum.
Results
Surgeons reported excellent experience with the 3D models (computerized and physical). It helped them in the decision process with an improved understanding of the relationship between prosthesis head and acetabulum, a clear view of the osteophytes and bone formation surrounding the pseudoacetabulum, and osteophytes inside the native acetabulum. These osteophytes were not immediately visible on 2D CT imaging slices. Surgeons reported a good fit and PSIs' simplicity of use. The hip stability was satisfactory during surgery and in the immediate post-op period. X-ray showed a good and centered position of the hip and good levels of the osteotomies.
Conclusions
3D surgical planning and 3D printing was found to be very effective in assisting surgeons facing complex problems. In these particular cases neither CT nor MRI were able to visualize all bony formation and entrapment of prosthesis in the pseudoacetabulum. 3D visualisation can be very helpful for surgical treatment decisions, and by planning and executing surgery with the guidance of PSIs, surgeons can improve their surgical results. We believe that 3D technology and its advantages, can improve success rates of hip stability in this unique cohort of patients.

Keywords : 3D software, 3D printing, Sarcoma
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/3d-surgical-planning-and-3d-printing-pictures.docx, http://sites.altilab.com/
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3D surgical planning and patient specific instruments in bone tumor resection.

Abstract ID : 1253
Submitted by : Roberto Velez the 2016-02-13 19:35:11
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

3D surgical planning and patient specific instruments in bone tumor resection.

Bone tumor resection can benefit from precision enhancing technology like navigation-assisted surgery (NAS) or patient specific instruments (PSI). NAS can improve surgical accuracy in bone sarcoma surgery according to reports, but needs special expensive hardware and software and a steep learning curve. PSIs have been developed as a simpler and cheaper alternative without special instruments or learning curve. We present the use of 3D surgical planning and PSIs for complex bone resections in bone tumor patients.

Patients and Methods

Between April 2014 and October 2015, we have performed 3D preoperative planning of 6 bone tumors subsequently resected them with PSIs. The mean age of the patients was 26.8 (6 – 55). There were 2 Ewing sarcomas, 2 chondrosarcomas, 1 high grade osteosarcoma, and 1 monostotic breast cancer metastasis. The lesions were located in 3 in the pelvis and 3 in the femur. All cases required the PSI cutting guides and one case also required PSI for structural intercallary allograft geometric cutting. Reconstructions required endoprosthesis in 2 cases, structural allograft in 2 cases, custom implant and endoprosthesis in 1 case and 1 case was not reconstructed. DICOM images from preoperative CT and MRI were anonymized and sent to the 3D-PSI manufacturers (Visyos-3dside or Avinent). After CT and MRI fusion, 3D models were generated and resection planes were confirmed. Patient specific cutting guides were the designed and manufactured according to plan. These guides were then applied intraoperatively guiding the osteotmies with standard bone saws. We evaluated time required for PSI fitting and bone cuts. We recorded any complications arising from their use. Tumor margins and local recurrence were evaluated as standard.

Results

The use of PSIs for bone resections was successfully performed without major difficulties. On average PSI fitting required 6.2 minutes (2-17) and then the osteotomies were performed in 3.5 minutes (1-11). There were no complications with the PSIs and all fitted anatomically.
All osteotomies with PSIs had negative margins. One patient with a pelvic chondrosarcoma had a positive margin by a tumor periosteal 1 millimiter disruption not related to the osteotomies or PSI use. After follow-up (average 6 months, range 3-28) all patients are without evidence of disease except one patient with local recurrence and multiple lung metastasis.

Conclusions

Early clinical results show that PSIs can be a valuable technology, easily applied and cheaper to NAS for precision enhancement of bone tumor surgery. PSIs do not seem to delay standard intraoperative times as they can be fitted quickly and without associated complications. Further comparative trials with conventional or NAS are needed to evaluate the definitive clinical efficacy and precision of PSIs.

Keywords : Patient specific instruments, margins, bone tumor
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/img-3753.jpg, http://sites.altilab.com/files/122/abstracts/img-4026.jpg
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A challenging and rare diagnosis of a Malignant Perivascular Epithelioid Cell Neoplasm (PEComa) of the calcaneus with TFE3 expression

Abstract ID : 1486
Submitted by : André Coelho the 2016-02-22 21:24:57
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Perivascular epithelioid cell neoplasms (PEComas) are rare mesenchymal tumours of uncertain histogenesis and potential for aggressive biological behaviour. Recently, a subset of these tumours harbouring TFE3 translocations was described, with evidence of a different pathogenic mechanism that does not involve the TSC2 gene, which seems to have a role in the regulation of the mTOR pathway and is usually lost on conventional PEComas.

Clinical Case

A 63-year-old female with no relevant medical history complained of right talocrural pain. An initial study with plain x-ray did not reveal any significant change and she received symptomatic treatment.
One year after, the patient was referred to our institution for
persisting pain, associated with tumefaction and loss of function.
Magnetic resonance imaging (MRI) of the lesion revealed a solid destructive tumour of the calcaneus with soft tissue component, measuring 7cm. It also showed secondary foci on the astragalus, navicular, cuneiform and also on the tibial diaphysis, all of them ipsilateral, which were considered metastatic lesions. A core biopsy was performed, revealing a malignant tumour with expression of melanocytic markers, narrowing the possibilities to a Clear Cell Sarcoma, a PEComa or, less likely, a metastatic Melanoma. On this
setting, analysis of V600 mutations on the BRAF gene and
translocations of the 22q12 (EWSR1) gene were performed and were negative, supporting the diagnosis of PEComa. Bone scintigraphy and computed tomography (CT) scan did not reveal any other distant lesions, and the patient was proposed for a transfemural amputation.
On the surgical specimen the diagnosis of PEComa was confirmed. It had a mitotic rate of 2 mitoses per 50 high-power fields, more than 50% of necrosis and vascular invasion, which were histological features of malignancy. The tumour was also positive for TFE3 on immunohistochemistry technique, resulting in the final diagnosis of a Malignant PEComa of the TFE3-positive subset. It was also evident on histological analysis that the secondary lesions described on imaging techniques were in fact invasion by continuity of the main mass, which was extremely infiltrative on bone structures, frequently presenting as discohesive cells. The patient remained in vigilance without adjuvant therapy, a decision backed by the current evidence. After a period of 5 months disease-free, a CT-scan revealed a lytic lesion of 5 cm on the right ischiopubic ramus, confirmed by Positron Emission
Tomography (PET)-CT, which also showed secondary lesions on the medial condyle of the left femur and on the right humeral head. Because of this, it was decided to start systemic therapy, and the patient is currently being treated with mTOR inhibitor (temsirolimus).

Conclusion

Although mTOR inhibitors have benefits in patients with metastatic PEComas, it is still not known if it applies for TFE3 positive tumours. The studies on this distinctive subtype are suggesting that these patients may not respond, but this knowledge is not yet translated into clinical practice.

Keywords : PEComa, TFE3, temsirolimus
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A patients perception of changes and consequences after tumor surgery / treatment.

Abstract ID : 1101
Submitted by : Carmen Trost the 2016-01-29 12:29:27
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

“A patients perception of changes and consequences after tumor surgery / treatment.”

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Introduction:
Patients with a cancer disease have healthy and sick parts in their life and daily routine. They live with both and do not think all day long on their illness. In a life-threatening situation the perception is restricted. Patients with a longer case history – especially tumor patients – have knowledge about the procedures at the hospital and the specialized communication. The diagnosis has been made. The individuals have to settle back into their old life, become immersed in the daily routine.
As patients are first confronted with the fact of having a cancer causing tumor the next medical step is preparing them for possible surgery. This event can be life changing and therefore it is essential to gather and analyse the patient’s opinion in retrospect.
Issue:
What are the milestones to find in a daily routine after tumor surgery / treatment?
Hypothesis:
Patients with good doctor-patient-relationship have a better compliance and are more positive about their clinical picture. Profound knowledge about prognosis, treatment and potential side effects have a positive effect for the confidence of the doctor-patient-relationship.
Aim:
The present study focuses on the patient’s perception of the impact and consequences of tumor treatment.
Methods:
The data is collected by personal interviews, which are recorded and then transcribed in compliance with the previously established transcription rules. The analysis will be conducted using the Grounded Theory. This will be a qualitative analysis because I want to get a subjective perception. Therefore I am using open questions and the respondent is able to answer as he likes.
Outlook:
These results can generate ground for future psychological hypotheses regarding doctor-patient‘s- interaction, sociological changes and cancer patient’s expectations.
Presentation:
This project has a term of 3 years. I will present interim results.

Keywords : patient-doctor-communication
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A singular enchondroma presenting as a pathologic humerus fracture in a patient with multiple osteochondromas. A case report.

Abstract ID : 1487
Submitted by : Daniela Hirzberger the 2016-02-22 21:35:20
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives:
Hereditary multiple osteochondromas (hereditary multiple exostoses, diaphyseal aclasis) is a rare autosomal dominant disorder characterized by the formation of multiple osteochondromas, mostly in the long tubular bones (humerus, radius, ulna, femur, tibia, fibula), and the development of associated osseous deformities. The disease is typically diagnosed during childhood and requires a lifelong monitoring, mostly because of the risk of the malignant transformation into a secondary chondrosarcoma. Surgical treatment is sometimes needed in painful osteochondromas, in cases of local mechanical irritation of the soft tissue, or in cases of vascular compromise or nerve compression.
Benign bone tumors producing hyaline cartilage can occur intramedullary, eather as a single lesion (enchondroma), or as multiple lesions (enchondromatosis). Ollier disease and Maffucci syndrome are the most common subtypes of enchondromatosis while the others like metachondromatosis are much less frequent. Ollier disease is a non-hereditary developmental disorder characterized by the occurrence of multiple cartilaginous masses, particularly affecting the long tubular bones of the limbs. When haemangiomas are also present, the disorder is referred to as Maffucci syndrome. Metachondromatosis is an extremely rare hereditary disorder involving the formation of both enchondromas and osteochondromas. It is distinct from hereditary multiple osteochondromas as the orientation of lesions in metachondromatosis is towards rather than away from the epiphysis, and there is a predilection for the hands and feet. There have been only approximately 50 cases reported worldwide.
We report the case of a 40 year old patient with multiple osteochondromas and a single enchondroma of the humeral proximal meta-diaphysis.

Case presentation:
A 40 year-old patient with known multiple osteochondromas was referred to our hospital with pain in the left humerus after falling on the left arm. X-rays and contrast enhanced MRI of the left humerus showed a pathological fracture of the left proximal humeral meta-diaphysis through the bizarre deformity due to known osteochondromas. In the area of the fracture, an intramedullary lesion was observed, with enchondroma-like typical popcorn calcifications. A biopsy was performed, and the histological examination revealed features of an enchondroma without evidence of malignancy.
The treatment included curettage of the enchondroma, subsequent filling of the defect with beta-tricalcium phosphate bone graft substitute chronOS®, and Philos plate osteosynthesis. The histological examination of the curettage material confirmed the diagnosis of an enchondroma.

Discussion/Conclusion:
This case highlights the importance of clinical and even more radiological examination, and also raise awareness of the possibility of a patient having more than one tumor in the same location. Although radiological presentation of the enchondroma could be typical, bizarre bone deformity in patients with multiple enchondromas could linger radiological analysis. The treatment in the patients with two different, still benign lesions, should not differ the standard osteochondroma/enchondroma treatment, even in the cases of the pathologic fracture. Regular, lifelong check-ups are recommended.

Keywords : Multiple Osteochondroma, Enchondroma, pathologic fracture
Authors :
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A systematic analysis of the reasons for prosthetic failure after total humerus replacement with the MUTARS™ system following resection of primary or secondary malignant bone tumors

Abstract ID : 1302
Submitted by : Dimosthenis Andreou the 2016-02-14 19:15:33
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Obectives: The humerus is the third most common localization of bone sarcomas and the second most common localization of metastases in the long bones. The resection of the whole bone and the reconstruction with a total humerus replacement can be necessary in patients with large tumors, however little is known about the complications rate of this rare reconstruction method. Our aim was to systematically evaluate the reasons for the first endoprosthetic failure following resection of the total humerus and reconstruction with the MUTARS™ system.

Methods: We performed a retrospective analysis of the files of 22 consecutive patients, who underwent resection of the total humerus due to bone sarcomas (n=18) or bone metastases (n=4) and reconstruction with the MUTARS™ system between 1999 and 2011 at our department. Failure modes were classified according to Henderson et al. as mechanical (soft tissue failure – type I, aseptic loosening – type II, structural failure – type III) and nonmechanical (infection – type IV, tumor progression – type V). Non-parametric analyses were performed with the Mann-Whitney U test. Survival curves were calculated with the Kaplan-Meier method and compared with the log-rank test.

Results: The median duration of surgery amounted to 270 minutes (range, 120 – 542 minutes). The median reconstruction length was 28 cm (range, 25 – 31 cm). The median follow-up amounted to 32 months (range, 3 – 159 months) for all patients and 62 months (range, 3 – 159 months) for survivors. Seven patients suffered from an endoprosthetic failure after a median interval of 2 months (range, 1 – 21 months). The prosthesis survival probability amounted to 72% after 1 year and 65% after 5 years.
The most common failure modes were infection and soft tissue failures developing each in 3 patients, followed by a tumor recurrence in one patient. The duration of surgery had no statistically significant influence on the development of endoprosthetic failure (p=0.898). There was a trend for a correlation between the length of reconstruction and implant failure (p=0.063). Patients undergoing local radiation treatment had a significantly higher probability for endoprosthetic failure (71% vs. 14% after one year, p = 0.042).

Conclusion: The resection of the whole humerus and the reconstruction with a total humerus replacement is a feasible alternative to amputation for patients with locally advanced bone sarcomas or bone metastases, however patients need to be informed about the high risk of endoprosthetic failure. More than two thirds of the patients in our cohort had to undergo removal of the prosthesis or secondary amputation following local radiation therapy, so that alternative treatment options should be evaluated when radiation treatment is deemed necessary or has already been performed.

Keywords : total humerus replacement, prosthetic failure, risk factors, malignant bone tumors,
Authors :
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Abstract: Quality of life and limb function after TM-ILP in patients treated for soft tissue sarcoma

Abstract ID : 1393
Submitted by : Lars Erik Podleska the 2016-02-20 18:38:20
Category : Margins in Sarcoma
Typology : Poster
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Introduction:
Within the last two decades TNF-alpha- and melphalan-based isolated limb perfusion (TM-ILP) has evolved into one of the best treatment options with the highest local response rates (60-80%) and limb salvage rates of over 80% for non-resectable soft tissue sarcoma (STS) of the the extremities that normally represent an indication for an amputation or major limb-function-impairing resection. Though TM-ILP has been performed for over 20 years now there is only limited information about long term limb function and quality of life (QoL) for patients after TM-ILP. The purpose of this study was to gain deeper insight into this matter.
Methods:
The study was conducted between 04/2014 and 12/2015. Limb function and quality of life were assessed by use of two self reporting questionnaires that patients were asked to answer during their regular follow up-examination. All patients included had received a TM-ILP due to non-resectable STS and subsequent limb sparing resection of the residual tumor 8 to 12 weeks after ILP. The participation was strictly voluntary. For the assessment of the quality of life we employed the QLQ-30 questionnaire by the EORTC (1) and for the assessment of limb function we used the German version of the Short Musculoskeletal Functional Assessment (SMFA-D) (2). The results from both tests were compared to three different reference groups: the QLQ-30 used the EORTC's reference values from the group of all cancer patients and the general population (3). The SMFA-D was compared to a group of healthy, working individuals (general population; n=10).
Results:
33 patients could be recruited for this study. The overall quality of life measured by the QLQ-30 did not differ significantly between the general population (mean: 71.2; SD: 22.4) and TM-ILP patients (mean: 75; SD: 18.5), while TM-ILP patients did score significantly higher ($p<0.05$, by one sample t-test) compared to the all cancer patients collective (mean: 61.3; SD: 24.2). For the other function scales TM-ILP patient scored significantly less on the physical function, role function and social function compared to the general population, while there was no significant difference on the emotional and cognitive function scale. On the symptom scales the only significant difference ($p<0.05$) between TM-ILP patients (mean: 24.2; SD: 34.6) and the general population (mean: 9.5; SD 23.3) was on the scale indicating financial problems being higher in the TM-ILP population. For the SMFA there was a significantly higher ($p<0.05$) score on the dysfunction index for patients after TM-ILP (mean: 19.2; SD: 15.3) compared to the general population (mean: 8.1; SD: 8.9). Similar significant tendencies could be found on the scales for daily activities and mobility. Results on the bother index, emotional status and arm- and hand-function did not show significant differences.
Conclusion:
Results show that despite functional impairment patient's QoL after TM-ILP is not less than the general population's. Due to the still small patient collective we advocate further research in the QoL research of STS patients after TM-ILP.

Keywords : Soft tissue sarcoma, isolated limb perfusion, quality of life, TNF-alpha, melphalan
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Acetabulum reconstruction

Abstract ID : 1140
Submitted by : Lauris Repsa the 2016-02-06 17:57:56
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction.
Tumors of acetabular region and espicially reconstruction has always been a challenge for orthopaedic tumor surgeons. Lack of adequate reconstruction methods has lead to unsatisfactory orthopaedic outcome. Acetabulum reconstruction with trabeccular metal augments after pelvis type II and III resections has offered a new dimensions from orthopaedic point of view. I would like to deal with our first expierence in this field in Hospital of Traumathology and Orthopaedics in Riga, Latvia.
Matherials and methods.
This is case report of our expiernce in acetabulum reconstruction using trabecular metal augments, functional outcome, complications. Due to small amount of cases, no statistical analysis was performed.
Results.
In year 2015 in Hospital of Traumathology and Orthopaaedics in Riga, Latvia we treated 2 patients with periacetabular high-grade hondrosarcoma. In both cases tumor was located in os pubis and periacetabular region.
In one case using extended ilioinguinal and lateral-posterior approach, was performed ramus inferior of pubic bone, os ilium and partial acetabulum resection. Acetabulum was reconstructed with buttres trabecular metal augments, hip replacement using cemented implants. After operation patient had n. Ischiadicus irritation for 6 weeks due to lack of tuber ischiadicum and massive augments used. After 2 month she was full wight-bearing using 1 walking-stick.
In other case using the same extended ilioinguinal and lateral-posterior approach, was performed pelvis type II and III resection, acetabulum reconstruction using trabecular metal buttres augments, hip replacement using cemented asetabular cup and uncemented femoral implant. During operation occured fracture of iliac creast, it was synthesised, joit capsule reconstructed using aorta prosthesis graft. After 2 months occured luxation in hip jpint. During revision rupture of aorta prosthesis was observed. It was removed, joined deep infection, which was treated with exchainge of acetabulum liner and femoral implant retaining trabecular augments, antibiotic therapy 6 weeks. Despite minor complications, patien is able to walk with one walk-stick.
Both patiens has no signs of recurrance of malignancy.
Conclusion.
Pelvis tumors is challenging for orthopaedic surgeons both- to treat malignancy and reconstruct leg functionality. In Hospital of Traumathology and Orthopaedics in Riga, Latvia our first expierence with wide pelvic tumor resection and acetabulum reconstruction using trabecular metal augments is considerable as sucsessfull despite great amount of local complications, which were solved with surgical and conservativ treatment methods. Acetabulum reconstruction with trabecular metal seems to be one of methods of choise for massive bone defect substitute.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/dsc00634.jpg, http://sites.altilab.com/files/122/abstracts/15.04.22-2.jpg
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Acute and Late Toxicity related to the adjuvant chemoradiotherapy association in the treatment of high risk soft tissue sarcoma: a restrospective analisys of 158

Abstract ID : 1094
Submitted by : daniela greto the 2016-01-26 18:52:33
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives
Standard treatment in high grade STS consists of wide local excision followed by adjuvant radiotherapy or amputation. Doxorubicin-based adjuvant chemotherapy demonstrated an increased DFS. It is still not clear the real toxicity related to the association of chemotherapy and radiotherapy and the optimal timing of the chemoradiotherapy association in the adjuvant setting. The present retrospective study was carried out to analyze if the association of Chemotherapy and Radiotherapy in adjuvant treatment of STS is safe in terms of toxicities. Overall Survival (OS), Local recurrence (LR) and Distant Recurrence (DR) related to the adjuvant treatment were reported.
Methods
Data of 158 patients affected by STS treated with surgery and adjuvant radiotherapy alone or associated with chemotherapy from June 1994 to November 2014 were retrospectively collected. All patients underwent adjuvant radiotherapy. The systemic therapy consisted of 3-5 cycles of Epirubicine and Ifosfamide. Hematological assessment was obtained before each chemotherapy cycle and daily during the chemotherapy treatment. The acute local toxicity related to the radiotherapy treatment was assessed by the CTCAE Version 4.0. The late toxicity was assessed by the RTOG/EORTC criteria.
Results
158 cases of STS patients treated with surgical excision and adjuvant radiotherapy with or without chemotherapy were analyzed. Mean follow up was 5.4 years (range 0.2-21.1 years). 54 high risk patients received chemotherapy. Among these 54 patients the most represented hematological toxicity was Anemia G2-G3 that occurred in 26% of patients followed by leucopenia that occurred in 11, 4% of patients (G2-G3 in 8 cases and G4 in 4 cases). Thrombocytopenia G2-G3 occurred in the 6.3 % of patients. Skin acute toxicity was developed in the 60.1 % of patients and it was G1 in 39 cases, G2 in 31 cases and G3 in 20 cases. Acute dermatitis determined interruption of the radiotherapy treatment in 19(12 %). Of the 19 radiotherapy interruptions, 5 were associated to chemotherapy. 22(13.9%) patients developed fibrosis G1 and 19 patients (12 %) fibrosis G2. Mild and moderate joint stiffness was recorded in 16(10.1%) patients and moderate edema was developed in 3.8% of patients. 2 patients had a bone fracture in the radiotherapy treatment field 18 months after the end of radiotherapy. 17(10.8%) of the 158 patients had a local relapse, mean time to develop recurrence was 3.4 years (SD 2.9; range 0.2-9.6years). 22(13.9%) patients developed distant metastases at a mean time of 2.7 years (SD 2.6; range 0.4-10.9 years). Distant Relapse Free Survival (DRFS) was 76.4 %. At the time of our analysis 30(19%) patients were died, overall survival (OS) was 64.6%.
Conclusion
Postoperative radiotherapy in localized STS is a well tolerated treatment, the addition of chemotherapy did not increase local acute and late toxicity. Prospective study are necessary to well define the timing of chemotherapy administration in relation to radiotherapy, the chemoradiotherapy association could be a good option to avoid possible reduction of disease local control.

Keywords : sarcoma, adjuvant treatment, radiotherapy, chemotherapy, toxicity
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ADJUVANT EXTERNAL BEAM RADIATION THERAPY PLUS BRACHYTHERAPY BOOST IN SOFT TISSUE SARCOMAS: CAN SURGICAL MARGINS PREDICT LOCAL CONTROL?

Abstract ID : 1378
Submitted by : Annalisa Cortesi the 2016-02-19 12:11:36
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectivies
The standard primary treatment of soft tissue sarcoma (STS) is radical surgical resection, preceded or followed by radiotherapy. The aims of this retrospective study were to assess the efficacy of perioperative brachytherapy (BRT) plus postoperative external beam radiation therapy (EBRT) and to evaluate the prognostic impact of surgical margins on local control (LC), metastasis-free survival (MFS), disease-free survival (DFS) and overall survival (OS).

Methods
The primary aim of the study was to analyze local control (LC) and overall survival (OS) in a large patients population treated with surgery, perioperative BRT and adjuvant EBRT +/- chemotherapy (CHT). Secondary objective was to identify prognostic factors for patients outcome in terms of LC, MFS, DFS and OS. BRT delivered dose was 20 Gy (with Low Dose-Rate or Pulsed Dose-Rate technique). EBRT was delivered with 3D conformal technique. Prescribed dose was 46 Gy (23 daily fractions). Neoadjuvant and adjuvant chemotherapy was prescribed in patients with potentially chemosensitive histological subtypes. Univariate analysis was performed with the log-rank test and multivariate analysis with Cox proportional hazard model.

Results
From 2000 to 2011, 107 patients (median age: 54 years, range 13-85; median follow-up: 100 months, range 48-176), presenting with high grade primary or recurrent STS were treated with surgery, perioperative BRT and adjuvant EBRT +/- CHT. Overall 5-year LC and OS were 82.2% and 87.8%, respectively. A trend between LC and margin status was recorded: patients with wide, marginal and intralesional surgical margins showed a 5-year LC of 86.1%, 70.5% and 66.7%, respectively (p 0.075). Furthermore also 5-year MFS, DFS and OS were worst in patients with positive margins. For wide, marginal and intralesional margins 5-year MFS was 73.6%, 61.0%, 61.7%, 5-year DFS was 63.3%, 48.2%, 50.0% and OS was 91.6%, 77.9%, 83.3%, respectively. At univariate analysis a higher LC was recorded in primary tumors (vs recurrent; p:0.015) and lower arm tumors (vs other sites; p: 0.027). An improved DFS was recorded in patients with lower arm tumors (vs other sites; p: 0.034).

Conclusions
The combination of BRT and EBRT was able to achieve satisfactory results. However, patients with marginal or intralesional margins or treated for recurrent tumor showed a worse LC. Prospective studies on combined modality treatment in the adjuvant setting of STS are still necessary to improve these results.

Keywords : radiotherapy, brachytherapy, margins
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Aneurysmal Bone Cysts: Results in 64 patients treated with different methods

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Submitted by : Hans Roland Dürr the 2016-02-04 11:54:04
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Despite being benigne primary aneurysmal bone cysts are in many cases aggressive and difficult to treat bone lesions. Regarding recent results a neoplastic origin must be considered. The aim of this work was to describe and qualify diagnosis and outcome in those lesions in a single institution with different therapeutiv approaches evolved over the time.

Patients and Methods
Between 1982–2014 in 64 patients a total of 80 procedures were performed in 64 patients. These 80 cases are described. The average age of the 43 women was 24 years (4-74 years), that of 37 men 24 years (6-71 years). Most frequent localization was the pelvis (n = 21), then the femur (9 prox, 5 distal), tibia (9 prox, 2 distally), the spine in 7 cases, the foot in 5 cases, a soft tissue ABC in 4 cases, the humerus in 5 (prox. 4, dist. 1), the radius in 5 (prox. 1, dist. 4), the hand in 3 cases, the fibula distal in 2 cases and patella, rib and ulna in each one case. 2 cases were multilocular. 65 curettages, 7 resections, 6 injections of polydocanol and 2 embolization in combination with denosumab were performed. In 28 cases, a phenol/alcohol combination was used as an adjuvant. One patient died independently to ABC. The follow-up averaged 106 (12-362) months).

Results
Local recurrence developed in 14 patients, 13 patients had at least a partial persistence. Thus 66% of the cases were cured. 44% of the curettages without adjuvant vs 26% of curettages with adjuvant developed recurrence or showed partial persistence of the lesion (n.s.). The resections so far showed no local recurrence. 7 of the 14 local recurrences occurred in year 1, 3 more by the end of year 2 and 4 in the course (Fig. 1). In 6 injections except for one case residual lesions were obvious. Two patients with denosumab therapy and embolization showed an excellent response with, however, residual lesions.

Summary
In this relatively rare lesion, curettage and bone filling showed a not satisfactory result. With an adjuvant, the recurrence rate decreased to 26%. The injection of Aethoxysclerol showed satisfactory results but with small residual lesions in all but one case. The two patients treated with denosumab showed an excellent response but also still residual disease.

Keywords : Aneurysmal bone cyst, therapy, surgery, targeted therapy, prognosis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abb-1.jpg, http://sites.altilab.com/
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Angiomatoid Fibrous Histiocytoma – Diagnostic problems, therapeutic consequences and 7-year-follow up in a 7-year-old boy

Abstract ID : 1466
Submitted by : Tarek Sununu the 2016-02-22 15:49:29
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Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: Angiomatoid Fibrous Histiocytoma is a very rare malignant soft tissue tumor. Only several case reports exist in the literature. Campanacci (1999) described it as a predominantly subcutaneous lesion occuring in children and young adults with a rather benign clinical behavior, especially the absence of metastases. A histologically distinct feature is the formation of an inflammatory pseudo-capsule around the tumor.
Material and Methods: We present the case of a seven-year-old caucasian male with a history of a swelling in the anterior distal thigh existing for several months previous to medical consultation at our hospital. No history of trauma or other diseases. The boy shows signs of chronic inflammation: he is pale, feels weak and ill, is anemic (Hb 7.8 g/dl), regional lymph nodes are enlarged. The needle-core biopsy shows an unspecific inflammatory tumor. One month later enlarged iliacal lymphnodes are resected as a second diagnostic step, without a change in the histological judgement. Because signs of chronic systemic inflammation persist and two biopsies suggest a benign inflammatory lesion a marginal resection of the primary suprapatellar tumor is performed. Only the molecular-genetic detection of the rearranged fusion-gene EWSR1/ATF1 leads to the correct diagnosis. Histology shows predominantly lympho-plasmocytic inflammatory signs, in addition focal spindle-cell proliferations. Immunohistochemistry demonstrates focal positivity for CD-30, as well as positivity for CD-99, CD-68 and CD-43 in the primary tumor as well as – in very low frequency - in the lymph-nodes. Together with the EWSR1/ATF-rearrangement the diagnosis of Angiomatoid Fibrous Histiocytoma with metastases in the regional lymph-nodes is established.
Therapy according to the CWS-protocol includes intensive chemotherapy and hyperfractionated radiotherapy of the primary tumor the regional lymphnodes (44.8 Gy).
Results:Seven years after diagnosis, 5 1/2 years after the end of therapy the boy remains disease-free and lives a normal life.
Discussion: Diagnosis of rare tumors may be challenging. It is of great importance to implement all modern techniques including immunohistochemistry and molecular genetics. This may be the only way to fix a correct diagnosis. Report of such rare diseases can help to improve further diagnostic paths.

Keywords : Angiomatoid Fibrous Histiocytoma, soft tissue tumor, CWS, moecular genetic, marginal resection
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Arthroplasty in patients with tenosynovial giant cell tumors

Abstract ID : 1139
Submitted by : Floortje Verspoor the 2016-02-06 14:11:43
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background and objectives Tenosynovial giant cell tumors (t-GCT) can behave local aggressively and affect joint function and quality of life (QoL). The role of arthroplasty in the treatment of t-GCT is uncertain. This article describes results of arthroplasty in t-GCT patients.
Methods Seventeen t-GCT patients received a prosthesis between 1985 and 2015. Indication for arthroplasty, recurrences, complications, Quality of Life and functional scores were collected and evaluated.
Results The knee (N= 12) and the hip (N=5) were affected, with a mean follow up of 5.5 (0.2-12.9) and 8.6 (range 7-14.6) years, respectively. Arthroplasty was indicated for extended disease or osteoarthritis. Two patients had recurrent disease. Two other patients had implant loosening. Functional scores showed poor results in almost half of the knee patients. Four of the hip patients scored excellent and one scored fair. QoL was decreased in one or more subscales for two hip and for five knee patients.
Conclusions In t-GCT patients with extended disease or osteoarthritis, prosthesis implantation is an additional treatment option. Patients following an arthroplasty of the hip performed better than patients after an arthroplasty of the knee. However, recurrences, implant loosening and other complications do occur, also after years of follow up.

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Augmented Reality in Bone Tumor Surgery

Abstract ID : 1050
Submitted by : Hwanseong Cho the 2016-01-04 14:50:05
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

ABSTRACT
Introduction: Recently, the navigation system has been introduced for intraoperative guidance. Despite favorable attributes of navigation-assistance in decision of surgical margin, somewhat cumbersome process and high cost may interfere with use of navigation in bone tumor surgery. AR is defined as a real-time direct or indirect view of a physical real-world environment that has been enhanced/augmented by adding virtual computer-generated information to it. AR applications to orthopaedic surgery are not yet clinically available, but may include bone tumor resection. We developed an AR-based navigation system which simply requires tablet PC instead of huge and complex navigation system. We evaluated the accuracy of AR-based navigation assistance in resection of the bone tumor through a simulation of bone tumor in the pig femora.
Methods: One hundred and twenty-three pig femora were employed in simulation of bone tumor. A cortical window was made on the diaphysis and bone cement was inserted. CT scan was used to measure the length of bones and extent of cement inserted in all 123 femora. Tumor resection was simulated into 3 manners. One was AR-assisted resection by an expert orthopedic oncologist, another was AR-assisted resection by a junior orthopedic resident and the other was resection by conventional method. One hundred and twenty-three femora were assigned through 2:1 allocation to the AR-assisted resection group (AR group) or conventional resection group (conventional group). Bone tumor resection was simulated with 10-millimeter safety margin proximally and distally to bone cement. The distance from the edge of cement to the resection margin was evaluated by another orthopedic surgeon. Two hundred and forty-six surgical margins of 123 femora were evaluated. Oneway ANOVA test was used for statistical comparison of the error between groups.
Results: A statistically significant difference was observed between AR-assisted and conventional resections ($p<0.05$). The mean error of 164 resections in 82 femora in the AR group was 1.71 mm (range, 0–6 mm: 1.76 mm in the expert resections and 1.65 mm in the resident resections). The mean error of 82 resections in 41 femora in the conventional group was 2.64 mm (range, 0–11 mm). The probabilities of a surgeon obtaining a 10-mm surgical margin with a 3-mm tolerance were 87.8% in AR-assisted resections by an expert, 92.7% in AR-assisted resections by a resident, and 72.0% in conventional resections by an expert.
Conclusions: We developed an AR-based navigation system which can run on tablet PC. We suggest that AR based navigation system is useful for safe resection of bone malignancy.

Keywords : Augmented reality, navigation, bone tumor
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/1.jpg, http://sites.altilab.com/files/122/abstracts/2.jpg
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Autoregistration in navigated bone tumor surgery

Abstract ID : 1375
Submitted by : Prakash Nayak the 2016-02-18 16:25:41
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

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* Introduction
The tracker registration process is the key stone step in image-guided surgery, but can often be time consuming and frustrating while hampering workflow. When applied to bone tumor surgery, anatomical points are often unavailable while surface matching forces unnecessary surgical exposure of 'normal'adjacent uninvolved bony anatomy. This study presents the development, testing and clinical validation of a novel "anatomy agnostic" metal-free tool to achieve reliable and consistent automatic registration as validated with low fiducial and target registration errors(FRE and TRE repectively). The system leverages the availability of Cone-Beam CT (iCBCT) system in the operating room(Zeego, Siemens Healthcare, Germany).

* Methods
Tools made of Ultem (amorphous thermoplastic polyetherimide (PEI) resin) with known fixed geometry and attached reflective markers were designed.The 'auto-reg' tools were placed on the patient's skin or on the operating table beside the patient ensuring that both the tumor and the tools were visible in the iCBCT imaging field of view(Figure 1). The points corresponding to the auto-reg tool geometry were then accurately identified on the CT image. The 3D spatial coordinates of the auto-reg tools and the tracker (a dynamic reference base fixed to patient's bone anatomy) were also captured at the same instance by an infrared camera (NDI Polaris,Waterloo,Canada)(Figure 2). Registration was then easily achieved as both the image and tracker coordinates of the auto-reg tools were known. This process involved no surgeon interaction and registration was possible before making the surgical incision.The registration process was depicted and validated using fiducial and target registration error (FRE and TRE) maps.

* Results
To date this novel technique has been used clinically on 6 patients with extremity tumors as a part of a larger study to validate a novel surgical navigation platform using iCBCT imaging. The ability to achieve registration prior to making a surgical incision and without requiring surgeon interaction to physically identify bony points, was found to be a significant benefit which enabled a seamless workflow when using iCBCT. The process brought down the mean registration time to less than 2 minutes once CT images were captured (which took an average of ~7 mins).The absence of metal artifacts and the ability to position the 'auto-reg' tools on or off the patient allowed the freedom in obtaining desired optimal fiducial configurations resulting in registration errors of less than 1 mm:mean TRE=0.90 +/- 0.24mm(standard deviation) and mean FRE = 0.86mm+/-0.23(standard deviation)(Figure 3).

* Conclusions
A novel method for automatic registration has been developed that is anatomy agnostic and free of metal artifact which allows freedom in achieving optimal fiducial placement.Using this system registration is possible before making the surgical incision and without surgeon interaction, and demonstrated consistent and reliably low FRE and TRE in a clinical setting for extremity bone tumor navigation using intra-operative cone beam CT imaging.

* Funding Sources
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Keywords : autoregistration,navigation,bone tumor,surgery
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Axial metastatic Ewing sarcoma

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Submitted by : Alexandra Paúl the 2016-02-23 16:27:00
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

We report the case of a forteen-year-old boy with an history of a worsening back pain lasting for several weeks, apparently triggered by trauma, followed by fever and abdominal symptoms. After a laboratory and imagiologic study, the diagnosis of appendicitis and acute pyelonephritis were excluded. Thinking about the possibility of discitis, he had a dorsolombar CT scan, which demonstrated multiple osteolytic lesions of the entire column, with a fracture and compression of L1. Evaluation by body positron emission tomography (PET) scan showed dozens of multiple hypermetabolic lesions located in the spine, sternum, hip bone, proximal portion of both the humerus and femurs, as well as millimetric lesions of the lung.
Laboratory tests revealed a sedimentation rate of 105 mm1ªh, C-reactive protein of 24 mg/dl, neuroenolase of 151 ng/ml, lactate deshydrogenase of 3466 U/L and a normal value of alkaline phosphatase.
Histopathological results confirmed the diagnosis of Ewing's sarcoma and molecular analysis identified the chromosomal translocation (11;22)(q24;q12) and the fusion product FL1-EWS.
Bone marrow examination showed tumor infiltration.
He started chemotherapy consisting of cyclophosphamide and topotecan as palliative care treatment. He had a very favorable therapeutic response, with resolution of the fever and pain in few weeks and with a progressive improvement of his mobility. He was able to restart his normal daily activity several weeks later.
Control tomography scan three and six months after the diagnosis showed a significant imagiologic response, documented by the resolution of most of the osteolytic lesions. PET scan six months after the begin of chemotherapy revealed all lesions with no metabolic activity, apart from D1, L3 and sacrum, and no pulmonary nodules.
He had local radiotherapy directed at the hypermetabolic lesions and lung. Following radiation, he received eight cycles of VAI (vincristine, actinomycin and ifosfamide), then he started metronomic chemotherapy with vinblastine and oral temozolamide alternating with cyclophosphamide, which he maintains at the moment.
The prognosis of patients with axial metastatic Ewing's sarcoma is dismal despite all the efforts and the multimodality approach. It was possible to control the disease and provide a good quality of life in spite of the severity of this case. He is still under maintenance chemotherapy and will continue for several months.

Keywords : axial ewing sarcoma, metastatic, multiple lesions, quality of life, prognosis
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Bone reconstruction after malignant tumor resection in adolescents using a bone transport and lengthening motorized intramedullary nail

Abstract ID : 1115
Submitted by : camille thevenin-lemoine the 2016-02-02 15:33:38
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Bone reconstruction after excision of malignant bone tumor of the limbs remains a challenge. The Fitbone* fully implantable intramedullary motorized nail has provides satisfactory results in limb lengthening according to the literature. We aimed at evaluating this device as a transport and lengthening nail.
Material and methods: Three male adolescents aged 12, 13 and 15, diagnosed consecutively with osteosarcoma of the distal femur, underwent large epiphyseal-sparing bone excision (respectively 13, 21 and 24cm). The first step of reconstruction combined the use of a methyl methacrylate spacer and a femoral locking nail allowing to bear weight. The second step was performed and average 8months later, when chemotherapy was over. In 2 cases it consisted in large cancellous bone auto and allografting (Induced membrane technique). Subsequent nonunion and length discrepancy were managed in a third step using a transport and lengthening nail. The third case was managed with a transport and lengthening nail and a 4cm allograft of the distal metaphysis as the second step.
Results: Bone transport was 6,3 and 4cm,followed by 4cm bone lengthening in the 2 last cases. Bone union was obtained in all 3 cases after an average 10months (Healing index 50days/cm). One patient required a nail exchange then a further bone autograft. One patient had a locking screw replaced.
Conclusion: Bone transport and lengthening using the fully implantable Fitbone* intramedullary motorized nail provided satisfactory and encouraging preliminary results in this challenging situation.

Keywords : bone transport, nail, malignant bone tumor
Authors :
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CAN MINIMALLY INVASIVE INTRAMEDULLARY FIXATION SYSTEMS BE ADOPTED IN LOWER LIMB METASTATIC LESIONS?

Abstract ID : 1150
Submitted by : Michele Boffano the 2016-02-07 02:50:59
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: The biggest issue in bone metastases is to prevent pathological fractures and often a minimally invasive system is preferable. The synthesis should be stable and last potentially all-life long. Long bones in the upper limb and in the lower limb have different biomechanical characteristics and requirements. A photodynamic intramedullary stabilization system has been described and used in the upper limb. We report a case of its exclusive use in a tibia to discuss the possible indications in lower limb metastatic lesions
Methods:
35 years old woman, BMI 21.3, left tibial painful multiple secondary lesions from a femoral hemangioendothelioma (Mirels score 10), ASA score 4, disease progression during chemotherapy, poor prognosis (lower than 6 months according to medical oncologists), no lung metastases. Two IlluminOss Photodynamic Bone Stabilization Systems (IlluminOss Medical GmbH, Germany) have been implanted in the left tibia. One anterograde from the proximal tibia, and one retrograde from the distal tibia (both 13x80mm). Surgical time 90 minutes under general anesthesia. The blood loss was unremarkable.
Results: After 4 weeks she started to walk unaided without crutches and without pain. Surprisingly she had a late response to chemotherapy with a stable disease. Patient is still alive after 2 years. No local complications occurred.
Conclusion: IlluminOss is a reliable system to stabilize pathological fractures and lytic lesions in the upper limb. Its use in the lower limb has been described in the fibula (exclusive use) or in the distal femur (augmented by plate and screws). The device is very interesting and its potential implantation under local anesthesia and sedation in a radiologic room could represent an excellent solution for poor prognosis and high risk patients. Biomechanical studies are ongoing to prove the reliability of the system in weightbearing bones.

Keywords : bone metastases, minimally invasive technique, lower limb, intramedullary fixation, pathological fracture
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Cancer care pathways and MDT meetings for pediatric bone tumor: are they effective in France?

Abstract ID : 1116
Submitted by : emilie peltier the 2016-02-02 16:17:51
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background:
Clinical practices guidelines for cancer recommend organized care pathways and multidisciplinary meeting. They should be systematically used in order to plan the management of all tumoral patients from beginning to end of treatment. We conducted a study to review clinical practices related to pediatric bone cancer patients in France.
Material and methods:
In order to evaluate and analyze delays and effectiveness of cancer care pathways and MDT meetings we created an online survey. This survey was sent to physicians registered in pediatric national society. This survey included 43 questions. The first part analyzed the quality of MDT meetings, practice patterns regarding clinical guidelines. The second part evaluated cancer care pathways and waiting times.
Results:
Overall 152 physicians participated. 37 cities joined the survey.
MDT meetings were used systematically with regards to clinical practices guidelines. 87.6% of cases were discussed in MTD meeting.
Success to reach a care treatment plan was found in 89% of cases. However, in 14% cases, care management plan after surgery were not discussed.
Cancer care pathways were used in 61.5% of cases. In 34.6% of cases, patients care pathways were not well defined and depends on various factors.
Rapid referral pathways were used for initial diagnosis, but clinically significant delays were identified in complex investigations.
Conclusion:
MDT meetings are effective in France and allow us to plan optimal cancer care. This study has identified a number of limits for coordination of cancer care after treatment. Cancer care pathways are yet to be improved. Waiting times and delays are reduced by the systematic used of cancer care coordination.

Keywords : cancer care pathways, MDT meeting, bone tumor, pediatric, waiting times
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Case report: Epstein-Barr-Virus negative diffuse large B cell lymphoma following total knee arthroplasty

Abstract ID : 1460
Submitted by : Magdalena Gilg the 2016-02-22 11:52:46
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

Introduction
Primary bone lymphomas (PBL) are extremely rare malignant neoplasms. The most commonly described subtype of PBL is diffuse large B cell lymphoma (DLBCL). Over the last decades, the use of total joint replacement surgery has increased. Herein we report the case of an 80- year old woman, who developed an Epstein-Barr-Virus (EBV) negative DLBCL in the periprosthetic membrane eleven years following total knee arthroplasty.

Case report
An 80-year old woman had undergone cemented total left knee replacement for osteoarthritis eleven years ago. Upon presentation the patient showed radiological and clinical signs of prosthetic loosening. During revision surgery the periprosthetic membrane was sent to the Institute of Pathology to exclude infection.

Results
The histologic examination showed connective tissue with massive hyalinization and sclerosis with a centrally, circumscribed, nodular infiltration of large lymphoid cells. The predominant cellular component consisted of blasts, with round and notched nuclei with clear chromatin and multiple nucleoli. The diagnosis of a DLBCL was supported by performing a polymerase chain reaction (PCR) demonstrating a gene rearrangement in the immunoglobulin heavy chain gene with a monoclonal peak at 243 bp and an immunoglobulin light chain gene rearrangement with a monoclonal cell population kappa A at 288 bp. EBV was excluded by a staining for EBER (in situ hybridisation for EBV) and by PCR.

Conclusion
Primary Non-Hodgkin lymphomas arising in the periprosthetic membrane are extremely rare. Most cases reported in this context are DLBCL associated with chronic inflammation and concomitant EBV infection. Our case of DLBCL, however, lacks EBV infection. Therefore, we think other factors, such as effects of metallic ions, may play a role in the pathogenesis of DLBCL.

Keywords :
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Cat at Home

Abstract ID : 1455
Submitted by : Florian Amerstorferf the 2016-02-22 10:46:10
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background
Cat-scratch disease (CSD) is an infection caused by small gram-negative bacteria. The Bartonella species are transmitted by bites or scratches from infected cats, dogs or rabbits. Beside asymptomatic cases, the infection can lead to neurological, ocular or heart diseases or mimick various disorders such as oncological processes. Thus, symptoms can be easily misinterpreted, which may lead to false or delayed diagnosis with inadequate treatment.
Patients
We present a case series of four patients, who were transferred to our musculoskeletal oncology outpatient department on suspicion of soft tissue tumors. Their ages were 16, 22, 28 and 37 years at admission (one female, three males).
Results
In three cases, soft tissue swelling occurred in the area of the elbow and in one case in the groin. History revealed swelling and pain without trauma for several weeks. Magnetic resonance imaging had already been performed in all patients, showing soft tissue tumors with an inhomogeneous contrast agent uptake (maximum diameter range from 18 to 47 mm). Two patients were transmitted to surgery - one incisional and one excisional biopsy were performed. Histology revealed the diagnosis of Bartonella henselea infection. In the other cases, physical examination documented scratches and/or bites seen at the forearm. In these cases the final diagnosis was obtained from serological investigations, showing high antibodies against Bartonella bacteria. Two patients were successfully treated by doxycycline, in the other two cases symptoms disappeared after operation.
Conclusion
The wide spectrum of possible clinical presentation of Bartonella infection may lead to false or delayed diagnosis. MRI with contrast agent is the diagnostic method of choice to characterize soft tissue swelling. However, it cannot differentiate between soft tissue tumors and Bartonella infection. Besides diagnostic imaging, physical examination and the patient's history display an important part in establishing the correct diagnosis. Thus, when a patient presents with a soft tissue tumor and scratches, one simple question may lead to the right diagnosis: Do you have a cat at home?

Keywords : Soft, tissue, tumor,Cat,Bartonella
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Chemoresistance of SW1353 Chondrosarcoma Cells Towards Cisplatin is partly dependant on Autophagy

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Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Chondrosarcoma is a rare tumor entity, nevertheless accounting for 16-20% of all bone sarcomas. The most striking characteristic of chondrosarcoma is its' relatively high radio- and chemoresistance leaving surgery as the only curative treatment option. Considering that the survival rates for chondrosarcoma have stayed the same for the last decades there is a great demand for a curative systemic treatment. Therefor the underlying mechanisms of chemoresistance in chondrosarcoma need to be investigated. As found previously the anti-tumor effect of 2-Methoxyestradiol (2-ME) in chondrosarcoma cells can be enhanced via inhibition of autophagy.
This study aims to investigate the synergistic effect of 2-ME and Bafilomycin (a V-ATPase inhibitor) compared to Cisplatin + Bafilomycin.
In order to evaluate cell viability in SW1353 cells treated with Veh, 2-ME +/- Bafilomycin and Cisplatin +/- Bafilomycin we used MTS-assays. Ultrastructural analysis of SW1353 cells treated as mentioned above was performed as well as Western Blot analysis of LC3 I & II to determine whether Cisplatin induces autophagy in SW1353 chondrosarcoma cellls. Interestingly we found that Cisplatin only slightly induces autophagy in SW1353 chondrosarcoma cells, our results interestingly show an 1.2-fold increase of the LC3 II / I ratio in cells treated with Cisplatin at 24hrs and a 0.8-fold decrease at 48hrs compared to cells treated with No Addition (NA). However we were able to detect autophagosomes via Transmission Electron Microscopy in cells treated with Cisplatin, which is a strong indicator for the presence of autophagic flux. Additionally we found that the synergistic effect of Cisplatin and Bafilomycin is relatively small compared to our previous findings with 2-Methoxyestradiol. Treatment of cells with 50uM Cisplatin, 100 nM Bafilomycin and 50uM Cisplation + 100nM Bafilomycin leads to a decrease in cell viability to 20.45%, 47.67% and 12.91% respectively.
These observations lead to the conclusion that Cisplatin does not induce autophagy as efficiently as 2-ME in SW1353 chondrosarcoma cells. However our findings suggest that the chemoresistance is partly dependant on autophagy. It strengthens our previous hypothesis that autophagy might be a mechanism of chemoresistance in SW1353 chondrosarcoma cells treated with 2-ME but and to a lesser degree in cells treated with Cisplatin.

Keywords : Autophagy, Chondrosarcoma, Chemoresistance, Cisplatin
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Supplementary material : http://sites.altilab.com/files/122/abstracts/graph1.pdf, http://sites.altilab.com/files/122/abstracts/graph2.pdf
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Chondroblastoma of the foot: 40 cases from a single Institution

Abstract ID : 1353
Submitted by : Ruggieri Pietro the 2016-02-17 04:57:13
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. Chondroblastoma of the foot is a rare lesion. We present our experience with chondroblastoma of the foot during a long-term experience in a single institution and discuss the related clinical in order to evaluate 1) clinical, histological and imaging findings of the chondroblastoma involving the foot, 2) the incidence of local recurrence, and 3) a review of the literature.
Material and Methods. We present 40 patients (30 males; mean age 25 years) diagnosed and treated for chondroblastoma in the foot from 1975 to 2012. Mean follow-up was 43 months. Clinical presentation, histology, imaging, surgical treatment and local recurrence were evaluated. Histologic diagnosis was established by open biopsy (30 patients frozen biopsy in the surgery) or trocar (10 patients). Ten patients (25%) had an aneurysmal bone cyst (ABC) associated. Furthermore we performed a search of the literature to identify patients who had been treated for chondroblastoma of the foot.
Results. Males were most affected than females: the ratio male to female was 3:1; however specifically in the talus this ratio was 4:1. Main symptom was pain (100%) accompanied by swelling (35%) with median duration of twelve months (range 12 to 36 months). Talus (50%) and calcaneus (37.5%) were the most affected bones. According to Enneking's System, 38 patients (95%) were diagnosed at stage 2 and two (5%) at stage 3. All patients underwent surgery: curettage (10 cases), curettage and bone graft (15 cases), curettage and cement (13 cases), wide resection (1 case) and Chopart amputation (1 case). Ten patients (25%) had secondary aneurysmal bone cyst. The overall local recurrence rate was 2.5% (one patient) and time to progression was 24 months. None patient developed metastatic bone diseases.
Conclusion. Patients with chondroblastoma of the foot are usually older than 20 years and males are most affected. Hindfoot is the most affected area. Associated ABC has the same frequency as other sites. Intralesional surgery and packing with cement or graft is successful in tumor control. Local recurrence in foot is lower than in other locations and there is not relation with the histology of the tumor.

Keywords : Chondroblastoma; Foot; Tumor;
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Chondrosarcoma of the glenoid cavity and coracoid process Reconstruction with an osteochondral lateral tibial plateau allograft.

Abstract ID : 1157
Submitted by : LUIS GOMEZ the 2016-02-08 16:41:45
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Chondrosarcoma is a malignant primary bone tumor characterized by cartilague-forming cells, and locally aggressive behavior, which does not respond to conventional chemotherapy or radiotherapy protocols. To date, surgical resection of these tumors remains the most effective treatment.

Case description

We report on the case of a 41 year old man with a coraco-glenoid chondrosarcoma grade II of the right scapula, confirmed by open biopsy.

Wide resection was achieved through extended deltopectoral approach.

Reconstruction choices: zone 2 parcial scapulectomy without reconstruction, prosthetic replacement or allograft reconstruction.

Since we had no availability of scapula allografs, we decided for an osteochondral lateral tibial plateau, considering the resemblance between the articular surface of the glenoid, its labrum and the lateral tibial plateau and the lateral meniscus. The lateral colateral ligament would perform as the supraspinatus tendon and anterior gleno-humeral capsule.

Once the lateral plateau was obtained from a proximal osteochondral tibia, a metaphyseal groove with high speed Burr was made. Then the allograft was rotated 90 degrees in order to embed the scapular blade. This embedding was secured with two 3.5 mm cortical screws.

The humeral head is carefully reduced and soft tissue reconstruction was meticulously done based on the lateral collateral ligament of the allograft as previously described.

Results

The pathologist reported grade II chondrosarcoma with safe oncological margins. MSTS functional scale reported 83% at six months postoperative, the patient returned to his daily activities with no restrictions.

Discussion

The standard treatment of grade II chondrosarcoma is wide resection as the achieved in this patient. The other challenge of is to restore the anatomy and function as close to normal. The choice of a lateral tibial plateau allograft with the meniscus, reproduces the local anatomy and allows prompt function recovery. This reconstruction is an option to consider in primary tumor lesions in the coraco-glenoid zone.

Keywords : chondrosarcoma, glenoid, allograft
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Supplementary material : http://sites.altilab.com/files/122/abstracts/coraco-glenoid-chondrosarcoma.docx, http://sites.altilab.com/
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Clinical experience with the new artificial bone graft substitute Calcibon

Abstract ID : 1104
Submitted by : Joerg Friesenbichler the 2016-01-30 20:10:17
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Artificial bone graft substitutes are getting more of interest due to the advantage of lacking donor site morbidity. The aim of the study was to evaluate the effectivity and complications associated with the bone graft extender.

Patients and Methods: Seventeen patients with benign and low-grade malignant bone tumours were treated with curettage and refilling the bony cavity using the α-tricalcium-phosphate Calcibon between 2013 and 2015.
Time to healing, local recurrence rates, and complications were evaluated. Complications were evaluated according to the classification system of Goslings and Gouma and bone healing was classified according to the modified Neer score.

Results: At a mean follow up of six months we could observe bone healing in the x-ray but no resorption of the bone graft substitute. These observations could also be made at the next two follow-ups after a mean time of 13 and 18 months, respectively. There were no local recurrences.
One patient developed idiopathic femoral nerve palsy and three revisions had to be done due to complications with the osteosynthetic material used for stabilization or delayed wound healing. No complications were associated with the bone graft substitute.
According to the classification system of Neer there were only Grade I lesions, meaning filled cysts needing no further treatment. Goslings and Gouma's surgical complications were graded as Grade I (complication meaning a temporary disadvantage without surgery, n=1) and Grade II (total recovery after revision, n=3).

Conclusion: Calcibon seems to be a reliable bone graft substitute with low complication rates despite longer time to resorption. Therefore, it can be recommended for application as alternative to autologous bone or allografts for correct indications.

Keywords :
Authors :
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Clinical Outcomes and Cost Analysis of 31 Hemipelvectomies

Abstract ID : 1396
Submitted by : Edgard E. Engel the 2016-02-21 02:35:15
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Hemipelvectomies has high complication rates demanding several reoperations with a considerable impact on overall costs. The objective of this study was to correlate the death and complication rates, the number of reoperations and cost to patient and surgery characteristics.
Patients and methods: The medical records and radiographs of 31 patients undergoing hemipelvectomy, in a single hospital from 1999 to 2015 were analyzed. Seventeen were internal and 14 external (54.8% and 45.2% respectively). The most common type was I + II + III (29.0%) followed by type III (19.3%) and II + III (12.9%). Patient and tumor characteristics and risk factors were identified. Surgery time, type of resection, type of reconstruction, pelvic organs involvement and the use of implants were analyzed as well. Costs of hospitalization, surgery and implants were analyzed separately. The death and complication rates, the number of reoperations and the cost of the procedure were considered as outcome variables. Qualitative variables were analyzed by chi-square test and quantitative by Student's t-test.
Results: The complication rate was 54.8%. Among the 17 patients who experienced complications, 9 (29.0%) had an infectious condition, 5 (16.1%) evolved to death during the hospitalization period, 2 (6.5%) had dehiscence of the abdominal wall and 2 had urinary fistulae (6.5%), one of them progressed to death. Only one patient continued with active infection after the follow-up period of six months, 88.9% success rate. Ten patients died, representing an overall mortality rate of 32.3%. Five deaths were related directly to the procedure (16.1%) and five late deaths, up to 6 months after surgery, due to the progression of neoplastic disease or due to complications.
The occurrence of complications was related to age, length of operation and accomplishment of bone or internal organ reconstruction. That led to a 470% increase in the total cost. The occurrence of infection was related only to operation length causing an increase of 276% in costs. Mortality was correlated to age, pelvic organ commitment, and comorbidities. It was higher in the external hemipelvectomies and combinations of type II resections. Surprisingly, histological grade, body mass, previous surgery, chemotherapy or radiotherapy and tobacco use could not be related to the outcome variables.
Conclusion: Our data confirm the findings of other studies in which the expected rate of complications is about 50%. It is most often related to infection and may be resolved in at least 85% of cases, even if this conversion to amputation or removal of implants are required. We also confirmed that the most important factors related to infection occurrence are operating time and the aggressiveness of resection, rather than patient and tumor characteristics. Finally, we found that the occurrence of complication increased the cost of the procedure four times, at least.

Keywords :
Authors :
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Clinical outcomes of the reconstruction after Limb-sparing surgery for osteosarcoma around the knee in children

Abstract ID : 1400
Submitted by : Eiji Kozawa the 2016-02-21 11:37:33
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

【Objectives】Limb reconstruction without the limb-length discrepancy after complete tumor resection and good limb function are the major factors in success in treatment of osteosarcoma in children. The purpose of this study was to analyze the outcomes and clinical features of reconstruction in children with osteosarcoma around the knee.
【Methods】
This study was composed of 32 patients aged 15 years or younger with osteosarcoma around knee treated with limb-sparing surgery from 1995 to 2014 in our hospital. There were 13 boys and 19 girls with a mean age of 11 years (range 4 - 15 years). The mean follow-up was 91 months (range 9 - 245 months). The mean tumor size was 82mm. The tumors were located in the distal femur (22 patients) and proximal tibia (10 patients). Endoprosthetic reconstruction was performed in 16 patients (expandable prostheses 6, prostheses 10), biological reconstruction in 11 patients (combination of pasteurized autograft and vascularized fibula graft 8, non-vascularized fibula graft 2, pedicle fibula graft 1), knee arthrodesis in 4 patients, and rotationplasty in a patient. Patient survival and the survival of the reconstructions were analyzed with use of the Kaplan-Meier method.
【Results】The overall survival of the patients was 74% at 5 years. Only one case had local recurrence and underwent wide resection for local recurrence. Eleven patients had distant metastases. Seventeen patients were continuous disease free, 6 were no evidence of disease, and 9 had dead with disease. The overall survival of the 16 primary prostheses was 100% at 5 years and 89% at 10 years. Thirteen patients developed complications that required re-operation. In 4 patients with prostheses, revision procedures were performed in 2 patients for aseptic loosening, amputation in a patient for infection, and rotationplasty in a patient for infection and limb-length discrepancy. In 9 patients with biological reconstruction, autogenous bone graft was performed in 7 patients for pseudarthrosis, prosthetic replacement and amputation was performed in each a patient. The mean limb-length discrepancy of 21 patients who reached skeletal maturity was 33 (range 0-180) mm. Six patients had the discrepancy of more than 20 mm. The discrepancy of skeletal matured 8 patients with combination of pasteurized autograft and vascularized fibula graft and skeletal matured 5 patients with expandable prosthesis had 10 (range 0-40) mm and 44 (range 10-80) mm of the discrepancy, respectively. Rotationplasty was performed in the patients with 80 mm discrepancy. A patient with knee arthrodesis at aged 4 years had the discrepancy of 180 mm. Two limb amputated patients and a patient who underwent rotationplasty walked with prostheses. Fourteen patients walked with orthoses, while the remaining 16 patients walked without supports.
【Discussion】We need to make the decisions about limb reconstruction for children with osteosarcoma around knee based on the growth of contralateral limb and the possibility for knee joint preservation with preoperative evaluation of tumor invasion. It will lead to good limb function to resolve the problems of salvage surgery particularly for complications after limb reconstruction and limb-length discrepancy during their growth and after their skeletal maturity.

Keywords : Osteosarcoma, children, lower limb, reconstruction
Authors :
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Clinical results of reconstruction using hydroxyapatite granule and hydroxyapatite particles/ poly L-lactide mesh plate for bone defects after bone tumor curettage.

Abstract ID : 1181
Submitted by : Taketoshi Yasuda the 2016-02-10 12:15:10
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Bone defect occurs after curettage of benign bone tumor and bone tumor like lesions. Bone grafting, which includes autografts, and allografts is the most common treatment for bone defects. However, it is necessary to increase a new intervention to a normal site in the case of autograft. Allograft does not spread widely for social and religious acceptance in some countries. Therefore, synthetic substitutes are often used. The aim of this study is to evaluate the clinical results of reconstruction using hydroxyapatite (HA) granules (REGENOS: Kuraray Co., Okayama, Japan) and HA particles/ poly L-lactide (PLLA) mesh plate (SuperFIXORB Mesh, Takiron Co., Tokyo, Japan) for bone defect after bone tumor curettage over 3-year follow up.
Materials and Methods: Fifteen patients underwent curettage for benign bone tumors and bone tumor like lesions in our institutions between 2008 and 2012. There were 9 males and 6 females, with an average age of 51.5 years (range, 16–81 years). The histopathological diagnose were solitary bone cyst (SBC) in 5, aneurysmal bone cyst (ABC) in 5, fibrous dysplasia (FD) in 2 and giant cell tumor (GCT) in 2. The tumor locations were as follows: 6 were in the humerus, 4 in the tibia, 2 in the femur, 1 in the fibula, and 1 in the radius. Surgical procedure as follow: After tumor curettage or resection, defect of cancellous bone was filled up by HA granules, and defect of cortical bone was reconstructed by HA/PLLA mesh in all cases. We evaluated the limb functional score according to International Symposium on Limb Salvage (ISOLS), complication during operation and clinical course, and the period to unification of a floor bone and implanted HA granules and HA/PLLA mesh. The unification was defined as diffuse sclerotic change such that the outline of the HA and HA/PLLA cannot be confirmed on plane radiograms. The radiological findings were evaluated at every three months for 1 year, 2 years and 3 year after surgery.
Results: The average of ISOLS score is 89% (range: 70-100%) at the last follow-up. postoperative diseased limb functions. There was not any serious complication during the surgery. One case, ABC which occurred in the tibia, had surgical site infection within one month. It was controlled by the washing and debridement with antibiotics. The mean period of HA unification is 8.2 months (range; 6-9 months). The mean period of HA/PLLA unification is 13.8 months (range; 11-18 months).
Discussion: Bone defects remaining after curettage of benign bone tumors should be filled with a substitute to restore mechanical strength. The choices include autogenous bone graft, allograft, ceramic material such as HA or β-tricalcium phosphate (β-TCP) and polymethylmethacrylate (PMMA) bone cement. Because HA and HA/PLLA are the same material and the affinity is high, we used HA for defect of cancellous bone and HA/PLLA for defect of cortical bone after bone tumor curettage. Our results showed to be a simple and easily accessible to the usual reconstructive methods, with acceptable functional outcome and complication rate.

Keywords : benign bone tumor
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CLINICAL REVIEW OF LARGE VOLUME CAVITY MALIGNANT PERIPHERAL NERVE SHEATH TUMOURS

Abstract ID : 1505
Submitted by : Thomas Cosker the 2016-02-22 23:42:30
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives
Cavity Malignant Peripheral Nerve Sheath Tumours (MPNSTs) are very rare lesions. They are both difficult to investigate and manage and there is currently no clear consensus on their treatment and management. This study aims to develop an algorithm for the treatment of this rare condition.

Methods
Our tumour registry from 2004 to current was analysed and 8 cases of large volume cavity MPNSTs were identified for inclusion.

Results
8 cases were identified that met the criteria (5F : 3M). Relevant case histories, investigations and follow up were recorded. The specialist group reviewed all of the cases in detail to consider and produce the appropriate recommendations.

Conclusion
Our specialist group recommend that if the lesion is central, symptomatic, with documented volumetric increase in size on imaging and with an SUV of >7, there is a significant chance of malignant transformation (albeit low grade). If the lesion is asymptomatic with no volumetric change on imaging with evidence of a long standing lesion being present and with an SUV <5 then most probably it is benign and conservative treatment with serial monitoring is recommended.

Keywords : MPNST, cavity
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Combination effects of hyperthermia and pazopanib for mouse undifferentiated pleomorphic sarcoma and osteosarcoma.

Abstract ID : 1325
Submitted by : watanabe kenta the 2016-02-15 16:10:48
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Cancer cells have poor mechanisms for adapting to and resisting the physiological stresses of heat, and are more vulnerable to heat-induced death than normal cells. The treatment using the mechanism is hyperthermia. To get an anti-cancer effect for only hyperthermia, the temperature is usually necessary more than 42.5°C. Because the normal cells and tissues may be affected at more than 42.5°C, combination therapy of hyperthermia and radiation and/or anticancer drugs are performed to get an antitumor effect at lower temperature. To date, combination effect of hyperthermia and pazopanib, which is a multi-kinase inhibitor, is not clarified yet. The purpose of this study is to evaluate the combination effect of hyperthermia and pazopanib for sarcoma cells.
Methods: RCT cell which is mouse spontaneous UPS and Dunn cell which is mouse spontaneous OS were used. Tumor cells at a density of 1x104 cells/well were seeded on 96 well culture plate and cultured for 48 hours. Next, the tumor cells were incubated for 1 hour at 40°C or 42°C as hyperthermia. After hyperthermia, tumor cells were incubated for 24 hours at 36°C with pazopanib by the various concentrations (control, 5, 10, and 20 μM/ml). To evaluate the survival rate of tumor cells, MTT assay was performed. To clarify the combination effect of hyperthermia and pazopanib, mRNA expression of Vegfr1, Vegfr2, Pdgfra, Pdgfrb and C-kit, which were target molecules of pazopanib, was measured by real-time RT-PCR.
Results: In both RCT cell and Dunn cell, the survival rate was not inhibited by only hyperthermia (control) at both 40°C and 42°C. Although the survival rate was not inhibited by combination of hyperthermia and 5 μM of pazopanib, it was inhibited by 10 μM and 20 μM of pazopanib in the dose dependent manner. In combination hyperthermia and 10 μM and 20 μM of pazopanib, the survival rate was significantly lower than that in only pazopanib (RCT; $p<0.01$, Dunn; $p<0.05$). In RCT cell, the survival rates were 42% at 40°C and 31% at 42°C with 10 μM of pazopanib, respectively. In Dunn cell, the inhibitory effects were 73% at 40°C and 54% at 42°C with 10 μM of pazopanib, respectively. The therapeutic effect of combination in RCT cell was significantly higher than that in Dunn cell. In both RCT and Dunn cell, the mRNA expression of Vegfr1, Vegfr2, Pdgfra and Pdgfrb decreased, however, that of only C-kit increased at all treated temperature.
Conclusions: Combination of hyperthermia and pazopanib was effective to inhibit the tumor survival in both OS cells and UPS cells. As mechanism of inhibitory effect, it was thought that hyperthermia leads to the down regulation of VEGFR and PDGFR. On the other hand, hyperthermia did not influence the expression of C-kit. These findings suggest that C-KIT signaling pathway might be useful to get the anti-tumor effect more in combination of hyperthermia and pazopamib.

Keywords : hyperthermia, pazopanib, combination
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Complex treatment of metachronous metastases of osteosarcoma with or without preoperative chemotherapy: comparative results

Abstract ID : 1272
Submitted by : Anatolii Diedkov the 2016-02-14 09:39:02
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Lung metastasis development after treatment is a negative prognostic factor for the long-term results in patients with osteosarcoma. The main treatment method for such category of patients is surgical removal of all metastatic lesions. This approach helps to achieve a quite high survival rate. There is no doubt among the majority of professionals about obligation of chemotherapy, however the need of preoperative chemotherapy is still under consideration.
Aim: To determine the preferable treatment regimen for patients with metastatic osteosarcoma.
Methods: 46 patients (mean age – 22,4 years; 17 women and 29 men) with metachronous metastases of osteosarcoma were considered fully operable subsequent to the results of CT in National Cancer Institute (Kyiv, Ukraine) 2010 to 2015. Metastases were detected between 6 and 38 months after the treatment (median - 22.3 months). The patients were assigned to 2 treatment groups. First group (n = 23; 50.0 %) underwent preoperative and postoperative chemotherapy: ifosfamide 9 g/m2, etoposide 150 mg/m2 and carboplatin 450 mg/m2. Second group (n = 23; 50.0 %) received the same scheme of postoperative chemotherapy only. The survival rate was estimated using Kaplan-Meier analysis. Mean monitoring time was 20 months (6 to 100).
Results: 16 patients (69,6%) underwent surgery, 7 patients (30,4%) received radiotherapy (15 Gray on each lung) due to disease progression in 1 group. 23 patients (100%) were operated in 2nd group. Event free survival rate was 28,4 % in preoperative and postoperative chemotherapy group, and 35,8 % in postoperative chemotherapy group, median survival was 14,2 and 18,3 months, respectively (without statistical significant difference). The chemotherapy toxicity was assessed according to Common Terminology Criteria for Adverse Events (CTCAE v.3.0). 26,5% of 1st group and 15,3% of the 2nd group was observed hematological toxicity grade 4 .
Conclusion: Preoperative chemotherapy in metachronous metastases of osteosarcoma has shown no benefits on survival. We suggest that preferable treatment strategy for such patients is surgical treatment followed by chemotherapy. The acceptable toxicity allows to implement the planned treatment without deterioration of oncological outcomes.

Keywords :
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Complications after endoprosthetics of long bone tumors

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Submitted by : Khurshidjon Abdikarimov the 2016-02-14 07:08:38
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim: to analyze the complications after arthroplasty in the treatment of tubular bones tumors.
Material and methods: the analysis of 225 arthroplasty was performed in surgical department of the musculoskeletal system tumors of RORC. There were 134 men, 91 women, the mean age was 25 years. 212 patients had primary tumors and 13 patients had metastases. According to the morphological structure in 68 patients there was revealed osteosarcoma, in 31 - chondrosarcoma, in 3 - Ewing's sarcoma, in 6 - myeloma, in 99 - giant cell tumor, in 2 - fibrosarcoma, 13 - metastases and single case of reticulosarcoma, malignant fibrous histiocytoma and angiosarcoma. In 31 cases they performed resection of the proximal femur with a hip replacement, in 134 - resection of the distal femur and proximal tibia with knee replacement, in 42 - resection of the proximal humerus with its arthroplasty, in 1 - resection of the distal humerus with the elbow joint arthroplasty, in 17 - resection of diaphysis of femoral bone and humerus with their arthroplasty. The length of the bone resection ranged from 8 to 24 cm.
Results. Patients were followed from 2 months to 20 years. Complications appeared in 38 patients (16.8%) - an infection of the prosthesis box (16), the instability of the implant (18), in 4 cases these complications were combined. In 11 cases infectious complications were treated conservatively. In 7 cases surgery performed in the different volume: 4 - crippling surgery, 2 - re-arthroplasty, 1 - removal of the implant with the imposition of compression-distraction osteosynthesis by Ilizarov. The cause of instability in 8 cases was the slacking of the prosthesis stem in the medullary canal, in 9 - structural failures (fracture of knuckle - 6, broken knuckle part - 2, fracture of the neck of hip prosthesis - 1), unwinding of construction - 1 (screw of hinge portion), in 1- dislocation of the head of hip prosthesis and in 1 - dislocation of shoulder prosthesis. 3 patients with slacking of prosthesis stem in conjunction with infection and 2 with broken prosthesis stem were made mutilating surgery. In 5 cases re-replacement was made, in 2 - reconstruction of prosthesis and in 1 patient with a fracture of the hinge portion the knee was fixed from the outside splint.
Conclusion. It should be noted that the introduction of antibiotic-containing bone cement for prosthesis stem fixation sharply decreased both the frequency of infectious complications and instability of the structure from 43.8% to 9.1%.

Keywords : long bone tumors, endoprosthetics, complications
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Supplementary material : http://sites.altilab.com/files/122/abstracts/complications-after-endoprosthetics-of-long-bone-tumors.doc, http://sites.altilab.com/
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Complications and direct costs associated with the managment of resection and reconstruction children osteosarcoma : comparison of conventional and magnetically controlled expandable prothesis

Abstract ID : 1388
Submitted by : Antoine Chalopin the 2016-02-19 23:15:52
Category : Others
Typology : Poster
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Authorisation to disclose : Yes/Oui

Introduction : The surgical managment of malignant bone tumors in young patients is often challenging because of the involvment of the physis and potential limb lenght discrepancy (LLD). The emergence of magnetically controlled growing prothesis provides the opportunity to avoid such surgeries and therefore to improve the patient's outcomes.
The aim of this study was to compare the complications and direct costs between conventionnal and magnetically expandable prothesis in children after bone tumor resection.

Methods : Between 2007 and 2015, 11 expandable prothesis were implanted in patients under 12 year of age affected by malignant tumours involving the distal femur (9), the proximal tibia (1) and the proximal humerus (1). Mean age was 10 years (range 8-12 years). Diagnosis was high grade osteosarcoma in all cases. Mean estimated LLD was 7 cm. Cases were divided in two groups, based on type of implant, 5 in the conventionnal expandable prothesis group and 6 in the magnetically controlled growing prothesis group.
All costs were expressed in euros and calculated in the perspective of the French sickness fund. All complications were collected and we calculated direct costs of the management of these complications.

Results : Mean follow up was 55 months (13-120). Two patients died in each group because of metastastic disease before starting the lenghtening. The mean length of bone resection was 17,8 cm.
Post-operative rate of complication was high in the conventionnal expandable prothesis group (80%) with mechanical failure, infection, nervous palsy or residual LLD (due to a malfunction of the lengthening mechanism). No complications occurred in the magnetically controlled growing prothesis group at last follow-up.
The estimated direct costs of conventionnal and magnetically expandable prothesis strategies were 36978 € and 36930 € respectively (with a time horizon of 4 years). In the conventionnal group, the costs of hospital stays expenses for distraction surgeries were represented 46% of the total amount.

Conclusions : The use of magnetically controlled growing prothesis reduced the total number of hospitalizations and avoided complications. Despite the high cost of these implants, its an innovative and promising strategy in this indication. These implants seems to be associated with an improvment of the patient's quality of life.

Keywords : children osteosarcoma, expandable prothesis, magnetically expandable prothesis
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Complications of percutaneous sclerosing therapy for aneurysmal bone cysts using ethanol and polidocanol

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Submitted by : LM Goedhart the 2016-02-08 22:26:52
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: This single-center descriptive cohort study aims to describe the results as well as the complications of percutaneous sclerosing therapy for ABCs using ethanol and polidocanol.

Methods: A total of 27 patients were included: 16 patients treated with ethanol and polidocanol, five patients treated with ethanol only and six patients treated with polidocanol only. Minimum follow-up was 12 months. Response to treatment, number of treatments and complications were described.

Results: A sufficient response to treatment was seen in eight patients (37.5%) after a single puncture procedure with ethanol and polidocanol. After two procedures this response rate increased towards 87.5%. Two patients underwent a third puncture procedure. A poor response to treatment was seen in one of these patients (6.3%), for which a surgical curettage was performed. The mean number of treatments was 1.75 (SD=0.68).
Complications were seen in 15.2%. Most complications were seen after the use of ethanol and polidocanol (19.2%) followed by 16.7% after the use of ethanol only. No complications were seen in the polidocanol only group. We monitored damage to the epiphyseal plate in four cases.

Discussion / Conclusion: Percutaneous sclerosing therapy using ethanol and polidocanol is effective and has the potential to reduce the number of treatments needed to obtain a sufficient result. However, it is not always safe! It is important not to underestimate the risks of using ethanol in terms of spill-out and potential damage to the epiphyseal plate, although the epiphyseal bars we monitored were more likely attributable to the ABCs localization.

Keywords : Aneurysmal Bone Cyst, Sclerosing Therapy, Treatment response, Complications
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Compression tumor endoprostheses as a salvage for failed revision oncology and revision arthroplasty in the lower extremity

Abstract ID : 1441
Submitted by : Krista Goulding the 2016-02-22 04:06:24
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Introduction and Objectives
Compression, compliant technology has not been well described in the setting of endoprosthetic revision or for revision arthroplasty. We present our experience with compression osteointegrative implants (CPS), and questioned whether the use of the CPS device in revision oncology and revision arthroplasty patients provided reliable, adequate fixation and implant survivorship similar to other prosthetic devices.

Methods
A retrospective analysis from 2006 to 2013 identified 31 patients treated with 33 lower extremity Compress® (Biomet Inc, Warsaw, IN, USA) endoprostheses for segmental bone loss. Fifteen patients were treated with a distal femoral CPS, 14 had a proximal femoral CPS, and 2 patients had a pelvic CPS following internal hemipelvectomy. Indications for a CPS were revision oncology in 16 patients, revision arthroplasty in 9 patients, and reconstruction following tumor resection in 6 patients. Overall implant survival, using all-cause revision as an endpoint, and CPS implant survival, defined as any failure of the CPS device (spindle, traction bar, anchor plug, fixation pins) requiring revision were calculated at 1 and 5 years of follow-up.

Results
Overall, 5 failures of the CPS device occurred in 33 implants (15%). Two patients (1 distal femur, 1 proximal femur) with failed revision arthroplasty each had 2 fixation failures and subsequent collapse of the interface. Both were revised to a cemented, stemmed EPR. One patient with a distal femoral replacement had a periprosthetic fracture through a pin site. Implant survivorship, with failure of the CPS device defined as the endpoint, was 84% (95% CI, 65 to 93%) at both 1 and 5 years post-operatively. With any-cause revision as the endpoint, survivorship was 76% (95% CI, 57-88%) at 1 year and 68% (48-82%) at 5 years. A multivariate Cox Proportional Hazards model revealed that neither BMI, age, location, diagnosis, post-operative cortex-to-spindle ratio, or follow-up cortex-to-spindle ratio were associated with increased rates of failure.

Conclusion: Compression osteointegration implants are viable options for reconstruction in the setting of primary or revision oncology procedures, as well as revision arthroplasty cases associated with massive bone loss in the lower extremity.

Keywords : COMPRESS; revision endoprosthetic reconstruction; osteointegration
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Considerations for Treatment of Posterior Interosseous Nerve Palsy Caused by a Soft-Tissue Mass

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Submitted by : Joseph Ippolito the 2016-02-22 00:05:00
Category : Others
Typology : Poster
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Authorisation to disclose : Yes/Oui

Background: Posterior interosseous nerve (PIN) palsy due to local compression is relatively infrequent and rarely caused by a pathologic lesion. Less than 100 cases have been reported in the literature with the most common culprits including lipomas, schwannomas, and hemangiomas. This paucity of cases has left many questions unanswered about this subject, although historically, the majority of individuals recover from the PIN deficits after local tumor resection. The wide range in reported recovery time (3 months to 10 years) has been attributed to several factors including: duration of pre-operative paralysis, pathologic diagnosis, and surgical approach.

Purpose: The purpose of this case series was to add to the current literature in regards to PIN palsy due to compression from a local soft-tissue mass and demonstrate that, prior to resection of the mass, adequate exposure and extensive neurolysis of involved structures ensure best the possible patient outcome.

Methods: From 2011 to 2015, a retrospective review of seven consecutive patients treated for posterior interosseous nerve palsy was performed. Charts were reviewed for patient demographic information, pathologic diagnosis, size of mass, surgical approach performed, and pre-operative duration of nerve deficits. Protocol for surgical technique was consistent throughout all cases. Prior to resection of tumor, the first priority was identification of the posterior interosseous, superficial radial, and common radial nerves, followed by neurolysis under magnification. After nerve structures were adequately released from affected area, resection of associated lesion was performed. Post-operatively, patients were placed in a protective splint for a week to allow soft-tissue healing, and allowed to bear weight as tolerated.

Results: Of the seven cases reviewed, diagnoses included four lipomas, one schwannoma, one hemangioma, and one osteochondroma. Patient demographics included four males and three females with a mean age of 52 years (range, 13-75). Mean follow-up was 20 months (range, 9-36). On initial presentation, all patients experienced motor weakness on the Oxford scale ranging from 2/5 to 4/5. Five patients (71%) experienced pain on presentation. Mean mass size was 56 ccs (range, 4-144). Mean duration of symptoms pre-operatively was 44 months (range, 1-120). All patients experienced full recovery with regards to motor strength and pain by their twelve-month follow-up appointment (Mean 9; range 3-12). One patient who has been seen for only 8 months post-operatively has experienced improvements in motor strength (4/5) and is pain-free. There was no difference in time to recovery for patients with lipomatous vs non-lipomatous tumors (10+0.9 vs 7+2.6; p=0.298). Mean MSTS scores were 29.4 (98%) (range, 26-30)
Conclusion: Posterior interosseous nerve palsy secondary to tumor is a rare, but treatable condition. This case series continues add to the literature, demonstrating that patients typically recover fully within a year post-operatively. The authors of this study recommend neurolysis of the posterior interosseous nerve, superficial radial nerve, and common radial nerve prior to removal.

Keywords : Posterior Interosseous Nerve
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Cryo-ablation in the treatment of ABC; does it improve outcome?

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Category : Others
Typology : Poster
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Authorisation to disclose : Yes/Oui

Abstract
Curettage with or without the use of adjuvants is the standard of care in the treatment of Aneurysmal Bone Cyst (ABC). In the past our institutional therapeutic approach for an ABC included curettage, high speed burr drilling and cryo-ablation.
In recent years we have changed this approach based upon results presented by other groups with less invasive surgical techniques and our own experience with other treatment modalities, such as embolization in pelvic lesions and watchful waiting in clinically silent lesions. Cryo-ablation is now used in accordance with tumor location, age of the patient and the surgeons' preferred technique.
The purpose of this study is to compare the outcome of patients diagnosed with an ABC treated by curettage and high speed burr-drilling with and without additional cryo-ablation treated at our institution between the years 2008 and 2014.

Methods
All patients treated for an ABC, between January 2008 and December 2014 were included in this retrospective analysis. Patient characteristics, such as age, gender and tumor location, type of treatment, time of follow-up, recurrence rate and functional outcome as measured by the MSTS93 score were noted and compared between the two main treatment options utilized, curettage and high-speed burr drilling versus curettage, high-speed burr drilling and adjuvant cryo-ablation.

Results
In total 50 patients were treated for an ABC during the study period. Five underwent resection/embolization only and are not included in the final analysis. 18 patients underwent curettage and high-speed burr drilling only (Group A), 27 patients had additional cryo-ablation with a closed Argon/Helium gas system (Group B) for a total cohort of 45 patients. Average age of the patients was 17.2 years in group A versus 18.6 years in group B. No local recurrence was noted in group A and one only in group B, functional outcome as measured by MSTS93 with a minimal follow up of 24 months was available for 13 patients in Group A (28.1) and 20 in group B (28.3). Complications that necessitated additional surgery were noted in five patients in the whole cohort and included one local recurrence, hardware removal in two and infection in another two patients.
No statistically significant differences were found between both groups in respect to age, local recurrence, surgical complications and functional outcome. Time of follow-up was significantly longer in the patients treated with cryo-ablation as compared to patients treated with curettage and burr drilling only (41.7 months compared to 26.9 months, p=0.006).

Conclusion
In this cohort of patients with ABC of the appendicular skeleton (pelvis included) treated with curettage and high-speed burr, no difference was noted in local recurrence and functional outcome in patients treated with or without adjuvant cryo-ablation. The difference in follow-up between both groups reflects our shift in treatment paradigm towards a less aggressive approach in these tumors.
In our opinion formal curettage with additional high-speed burr drilling achieves excellent tumor control rate with a low complication rate and good functional outcome, without the need for adjuvant treatment.

Keywords : ABC, cryo-ablation, burr-drilling, curettage
Authors :
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Cryosurgery as additional treatment in tenosynovial giant cell tumors

Abstract ID : 1138
Submitted by : Floortje Verspoor the 2016-02-06 14:08:15
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Tenosynovial giant cell tumors (t-GCT) emerge from the synovium and can behave aggressively. Surgical resection is the standard treatment. However, up to half of the patients show recurrences. Several additional treatments have been applied to reduce recurrences, none was proven to be superior to surgical resection solely. This article describes the results of cryosurgery in addition to surgical synovectomy.
Materials and methods
We retrospectively evaluated 141 t-GCT patients, of which 12 had cryosurgical treatment, between 1999 and 2007. The knee (n=8), hip (n=2), ankle (n=1) and elbow (n=1) were affected. They received a surgical synovectomy combined with cryosurgery. Outcome variables were treatment indications, recurrences, complications, quality of life (QoL) and joint function.
Results
Indications for additional cryosurgery were extended disease, bone involvement and locations surgically difficult to reach. Five patients had recurrent disease, all of which had prior treatments. None of the primary treated patients had recurrent disease. One patient had a deep infection. QoL was reduced in half of the knee and hip patients. Nine patients had a satisfactory joint function.
Discussion
Cryosurgery can serve as additional treatment to surgical resection in t-GCT patients. In particular, primary treated patients with extended disease or bone involvement show good results.

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Cryotherapy and cementoplasty in the surgical treatment of giant cell tumor of long bones

Abstract ID : 1264
Submitted by : Otabek Abdurakhmonov the 2016-02-14 05:52:38
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim: Study the results of improved methods of surgical treatment of giant cell tumor of long bones (GCT) with use of medical bone cement and cryotherapy at organ-preserving bone-plastic surgeries.
Material and methods: We analyzed the results of surgical treatment of 194 patients with the diagnosis of giant cell tumor of long bones who were treated from 2005 to 2015. Of 194 patients men was 91 (46.9%), women 103 (53.1%). The age of the patients changed from 14 till 59 years, on the average was 27.6 years. Depending on the methods of treatment all patients were divided into 2 groups. The 1-st group included the patients with excochleation and cementoplasty – 157 (80.9%), group 2 – excochleation, cryotherapy and cementoplasty – 37 (19.1%). Roentgenological investigation showed in 64% patients had alveolar-trabecular,in 21 % - osteolytic and in 15% - mixed forms of tumor. Involving of the articular surface of the bone into the process and pathological fracture were contraindications to performance of preserving operations with use of medical bone cement and cryotherapy. Operative intervention in GCT of the long bone with excochleation of tumor was performed by standard technique. After excochleation of the tumor the cavity was treated with 96%-ethanol three times, dried and filling with antibiotic-containing medical bone cement (hentamicin, tauromicin). During the process of hardening the heating of bone cement achieved 60ºC, which allowed to receive antitumor effect on the rest tumor cells in the cavity. The technique of cryotherapy was carried out with use of liquid nitrogen at temperature 196ºC. The filling of liquid nitrogen was made by doses for a long time after the application of gauze napkins to walls of a bone. The time of exposition of effect was 15-20 minutes.
Results: In our observation for estimation of the functional state of the extremity operated there was used scale of the Association of European Skeleto-muscular system (1986, EMSOS). All patients were under observation from 6 months till 8 years. At the analysis of frequency of recurrences of a tumor in the patients with giant cell tumor of long bones it was established, that the recurrence of a tumor was mainly revealed in group of the patients with the large sizes, roentgenologically with osteolytic form, after operation excochleation with autoplasty, as well with malignant variant of the giant cell tumor. The results of the analysis showed that in the first group in 13 (8.3%) out of 157 patients, in the second group in 3 (8.1%) out of 37 there was a recurrence of a tumor.
Conclusion: The application in the clinical practice of medical bone cement at giant cell tumor of bone has allowed to achieve high efficiency, less trauma degree, to reduce considerably the volume of operative intervention (previously the majority of the patients underwent segmental resection of the bone with endoprosthesis and/or bone plasty).

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/-1-emsos-2016-eng.doc, http://sites.altilab.com/
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CYTOTOXIC EFFECT OF ZOLEDRONIC ACID-LOADED BONE CEMENT (PMMA) IN HUMAN OSTEOSARCOMA CELL LINE

Abstract ID : 1047
Submitted by : Phutsapong Srisawat the 2015-12-22 07:44:19
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Osteosarcoma is the most common of primary bone cancer with involve patient in bimodal age. The current treatment include the multidisciplinary approach (surgery and chemotherapy and/or radiation). In orthopedic oncology practice, the bone cement (Polymethylmethacrylate, PMMA) have role in reconstruction by filling bone defect after tumor resection or stabilized the endoprosthesis. The bisphosphonate is widely used for osteoporosis treatment and prevent the skeletal-related events in skeletal metastases. In addition, the bisphosphonate show the potential to inhibit osteosarcoma cell in vitro. The purpose of this study was to analyze the cytotoxic effect of bisphosphonate (Zoledronic acid) to osteosarcoma cell line after loaded with PMMA bone cement in vitro.

Materials and Methods: The various concentrations of zoledronic acid were mixed with PMMA and placed in distilled water. The distilled water was test with osteosarcoma cell line in vitro for the cytotoxic effect in daily for seven days with the MTT assay and compare the cytotoxic effect of Zoledronic acid-loaded PMMA bone cement in various concentrations from first to seventh day.

Results: The zoledronic acid was released from PMMA bone cement pellet and still remained biologically active to inhibit the in vitro growth of osteosarcoma cell line. The effective concentrations of zoledronic acid-loaded PMMA bone cement were 0.50, 0.75, 1, 2 mg/g that inhibit osteosarcoma cell line 41.9%, 43.3%, 44.1%, 50%, respectively. They had statistically significant difference when compared with the zoledronic acid at concentration 0.25 mg/g that inhibit osteosarcoma cell line 18.75% ($p<0.001$).The effectiveness were related to elapsed time. The first day was the most effectiveness to inhibit osteosarcoma cell line when compared with second to seventh day. The zoledronic acid had synergistic effect to the doxorubicin that used as standard chemotherapy for osteosarcoma treatment.

Conclusions: In this study, the bisphosphonate (zoledronic acid) showed cytotoxic effect for inhibit osteosarcoma cell line after loaded with PMMA bone cement in vitro.

Keywords : Osteosarcoma, Bisphosphonate, Bone Cement, PMMA
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Detection of somatic mutations associated with pulmonary metastasis of osteosarcoma by whole exome sequencing

Abstract ID : 1446
Submitted by : Iwata Shintaro the 2016-02-22 09:16:53
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: Pulmonary metastasis is a main cause of death for the patients with osteosarcoma (OS), although no specific genetic alteration associated with pulmonary metastasis has been reported. The objective of this study was to identify candidate somatic genetic alteration contributed to pulmonary metastasis in pediatric OS.
Methods: Five sample sets including the tissues taken from primary tumor (P), resected pulmonary metastatic tumor (M), and normal tissue (N) of the same pediatric OS patients were analyzed by whole exome sequencing with Ion Torrent Proton sequencer. 40ng of genomic DNAs extracted from each tissue were used for multiplex PCR amplification with Ion Ampliseq Exome Kit. Data analysis including alignment to the hg19 human reference genome and variant calling was done using the Torrent Suite Software. Obtained genomic data was validated by visualizing in Integrative Genomics Viewer or capillary sequencing. Candidate somatic genetic alterations were annotated by wANNOVAR database. Pathway analysis was performed using GeneMANIA.
Results: Mean read depths on the P, M, and N were 219, 212, and 109, respectively. We identified 1364 and 1311 candidate non-synonymous somatic single nucleotide variants (SNVs) among the P and M, respectively. After the validation and filtering, we detected 135 non-synonymous SNVs within the exon region in M. Among these, 32 SNVs were overlapped with those in P. Only 2 recurrent SNVs were identified within the whole SNVs. C:G>T:A transition mutations were frequently observed in both P and M, and the frequency were higher in M comparing to P. Pathway analysis showed a significant enrichment of the candidate SNVs in genes involved in extracellular matrix regulation (FDR;2.37E-03).
Conclusion: We have identified 137 SNVs associated with pulmonary metastasis from pediatric OS. Extracellular matrix-relating signature might contribute to the genesis of pulmonary metastasis.

Keywords : Osteosarcoma, Metastasis, Whole exome sequencing
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Diacerein retards cell growth of chondrosarcoma cells at the G2/M cell cycle checkpoint via cyclin B1/CDK1 and CDK2 downregulation

Abstract ID : 1087
Submitted by : Birgit Lohberger the 2016-01-25 09:17:46
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Chondrosarcoma is characterized for its lack of response to conventional cytotoxic chemotherapy, propensity for developing lung metastases, and low rates of survival. Research within the field of development and expansion of new treatment options for unresectable or metastatic diseases is of particular priority. Diacerein, a symptomatic slow acting drug in osteoarthritis (SYSADOA), implicates a therapeutic benefit for the treatment of chondrosarcoma by an antitumor activity.
Materials and methods: After treatment with diacerein the growth behaviour of the cells was analyzed with the xCELLigence system and MTS assay. Cell cycle was examined using flow cytometric analysis, RT-PCR, and western blot analysis of specific checkpoint regulators. The status for phosophorylation of mitogen-activated protein kinases (MAPKs) was analyzed with a proteome profiler assay. In addition, the possible impact of diacerein on apoptosis was investigated using cleaved caspase 3 and Annexin V/PI flow cytometric analysis.
Results: Diacerein decreased the cell viability and the cell proliferation in two different chondrosarcoma cell lines in a dose dependent manner. Flow cytometric analysis showed a classical G2/M arrest. mRNA and protein analysis revealed that diacerein induced a down-regulation of the cyclin B1-CDK1 complex and a reduction in CDK2 expression. Furthermore, diacerein treatment increased the phos¬phorylation of p38α and p38β MAPKs, and Akt1, Akt2, and Akt 3 in SW-1353, whereas in Cal-78 the opposite effect has been demonstrated. These observations accordingly to our cell cycle flow cytometric analysis and protein expression data may explain the G2/M phase arrest. In addition, no apoptotic induction after diacerein treatment, neither in the Cal-78 nor in the SW-1353 cell line was observed.
Conclusion: Our results demonstrate for the first time that diacerein decreased the viability of human chondrosarcoma cells and induces G2/M cell cycle arrest by CDK1/cyclin B1 down-regulation. In summary, our findings strongly support diacerein as an interesting target for further investigation and development of novel therapeutics in sarcoma research.

Keywords : chondrosarcoma, diacerein, cell cycle, G2/M arrest
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Differences in tumour regression after chemotherapy between the bony and the soft-tissue compartment of Ewing's sarcomas

Abstract ID : 1465
Submitted by : Christian Smolle the 2016-02-22 15:37:17
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background:
Survival of patients with Ewing's sarcoma increased dramatically during the last two decades due to development of chemotherapy. Besides the presence of metastatic disease and the tumour's genotype, histological regression remains the strongest predictor of outcome. Ewing's sarcoma shows soft tissue involvement in 80% of all cases. The aim of this study was to examine whether there are differences in tumour regression after neo-adjuvant chemotherapy between the bony and the soft-tissue compartment of Ewing's sarcomas.
Methods:
We re-evaluated the post-chemotherapy histopathologic regression according to the classification score established by Salzer-Kuntschik in patients admitted to our department because of Ewing's sarcoma between 2005 and 2014. Inclusion criteria were: Ewing's sarcoma of the bone verified by biopsy with radiologically confirmed soft-tissue involvement and an overall regression score worse than 1.
Results:
Of 39 patients, 13 met the inclusion criteria, among them 4 women and 9 men. Compared to the bone, soft-tissue regression grade was worse in 10 cases and equal in 3. In no case bony regression grade was worse than soft-tissue regression grade. The difference of the regression grades was significant according to the Wilcoxon test (p=0.005).
Conclusion:
Although the soft-tissue tumour compartment usually shrinks remarkably during chemotherapy, we could find significantly more viable tumour cells in the soft tissue compared to the bone. The results suggest that chemotherapy is less effective in the soft-tissue compartment of Ewing's sarcomas.

Keywords :
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Disease progression and survival in patients with metastatic soft tissue sarcoma treated with palliative chemotherapy.

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Submitted by : Sophie Mottard the 2016-02-25 13:20:22
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

High grade sarcoma present a systemic metastatic progression in approximately 50% of cases. The effectiveness of palliative chemotherapy as a treatment of systemic metastases is still controversed. The main objective of this study is to assess disease progression and survival of patients diagnosed with metastatic soft tissue sarcomas treated with palliative chemotherapy, analyse chemotherapy treatments patterns and response to different lines of treatment.
Retrospective chart review of 75 patients treated with palliative chemotherapy for metastatic soft tissue sarcomas between 2003 ans 2013 at Maisonneuve-Rosemont Hospital. Data for control group of 40 patients with metastatic soft tissue sarcomas not treated with chemotherapy was collected retrospectively. Collected data include demographic data, overall survival, time free survival, type of chemotherapy treatment, surgical treatment and adverse reaction to palliative chemotherapy. Overall survival was analyzed with Kaplan-Meier test. Categorial variable was compared with Log-Rank test.
Seventy-five patients (37% female; mean age 50.4 years) received minimally one line of chemotherapy for their metastatic sarcomas. The regimens most commonly used in first-line were doxorubicin combined with ifosfamide(21.3%). Favorable response was achived by 38.7 % in first-line and 27.9% in second line therapy. Median overall survival was 19 months with chemotherapy treatments and 7 months without chemotherapy treatments($p<0.0001$). There was nos statistically significant difference between survivals for treated and untreated patients with chemotherapy when analysed in term of the histological subtype, age and monotherapy versus combined treatment. Event-free survival was statistically longer during the first year for the group of patients treated with combined chemotherapy ($p=0,0125$).
Results have shown a significantly improved overall survival in all histological groups, resulting in an OS of 19 vs 7 months for the chemotherapy and non chemotherapy group respectively. Nevertheless, patients with favorable response to chemotherapy have poor outcomes. Additional treatment options are needed.

Keywords : Chemotherapy, sarcomas, soft tissue, metastatic, survival, progression
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Distribution patterns of foot and ankle tumors

Abstract ID : 1051
Submitted by : Andreas Toepfer the 2016-01-06 22:26:34
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Bone and soft tissue tumors of the foot and ankle are not rare. The foot and ankle, which represents approximately 3% total body mass, is also the site of 3% of osseous neoplasms. Even more important, approx. 5% of malignant and 8% of all benign soft-tissue tumors occur at the foot and ankle region. Nevertheless, diagnosis is often delayed as diagnostic errors are more common than in other regions. Awareness for this localization of musculoskeletal tumors is not very high and neoplasia is often not considered.
Purpose and Questions: Bone and soft tissue tumors oft the foot and ankle and their distribution pattern will be analyzed on the basis of a retrospective single-centre study with a population of 409 consecutive patients. The question is to be answered if there are any unidentified distribution patterns that are related to epidemiological factors. Moreover, are there any entities that are found predominantly at the foot and ankle and that concentrate on specific localizations?
Patients and methods: As part of a retrospective, singe-centre study (EBM Level III), the data of 409 patients that were treated for foot and ankle tumors between 1997 and 2014 was analyzed regarding epidemiological information, entity and localization. Included were all cases with a tumor (including tumors of unknown origin) of the foot and ankle. Exclusion criteria were incomplete information on the patient or entity (e.g. histopathological diagnosis) and all pseudotumors like ganglia, osteoarthritic cysts or Morton´s neuroma.
Results: 409 cases of tumors of the foot and ankle were included (200 male and 209 female patients, age 45 ±19y (min.5y, max.92y). 258 tumors involved the bone, among them 230 benign and 28 malignant.
There were 151 soft tissue tumors (110 benign, 41 maligant). The most common benign osseous tumor lesions included simple bone cysts, aneurysmal bone cysts and giant cell tumor. By far the most common malignant bone tumor in our patients was chondrosarcoma. Common benign soft tissue tumors included hemangioma and PVNS whereas the most common malignant members were synovial sarcoma and myxofibrosarcoma. Compared to similar other studies, our results show only a few parallels. Distribution patterns of foot and ankle tumors seem to demonstrate great heterogeneities. In contrast to the most common tumor sites of musculoskeletal neoplasms, distribution patterns of foot tumors might not be as reliable in the assistance of finding a specific diagnosis to a tumorous mass as in other localizations.
Conclusions: Distribution patterns seem to demonstrate a great heterogeneity. Knowledge of typical appearance and common localizations of foot tumors will help to correctly assess unclear bone and soft tissue lesions and initiate the right steps in further diagnostics and treatment.
Unawareness can lead to delayed diagnosis and may result in undertreatment or overtreatment with serious consequences for the affected patient.

Keywords : foot tumor, foot and ankle tumors, sarcoma, unicameral bone cyst, PVNS
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Dorsal corpectomy for treatment of mediastinal angiosarcoma with vertebral invasion

Abstract ID : 1395
Submitted by : Rafael Luque the 2016-02-20 21:39:20
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

68 year old patient referred from internal medicine diagnosed of angiosarcoma of the left posterior mediastinum. In the chest CT, no supraclavicular lymph nodes were observed, axillary, mediastinal or hilar of significant size. Moderate left pleural effusion associated with passive atelectasis. Parenchymal lung nodules not seen bibasal aiming lung atelectasis and bronchiectasis in RIL and ML. Paraseptal emphysema predominantly in RSL and ML. Paravertebral soft tissue mass left of 4.4 x 3.4 cm which causes erosion on the left lateral side of the vertebral body of D10. In sections of the upper abdomen displayed in this study calcified granulomas liver and kidney cysts are observed unchanged. In the PET-CT the left paravertebral mass persists, up to D10-D11, which erodes the vertebral body of D10.
Methods
With the diagnosis of Sarcoma posterior mediastinum: high-grade sarcoma Immunophenotypically angiosarcoma
Results
Surgery was permormed first in right lateral decubitus. Left thoracotomy initial opening for the 5th ICS. Lung joined anterior chest wall and mediastinum. Release. tumor of about 5 cm is played at a later segment infiltrating D10 vertebral body, disc D10-11 and D11 body part. It is performed by 8ºEIC thoracotomy. Pulmonary parenchyma section LLI. Dissection of the tumor mass on the chest wall infiltration leaving column. transverse and longitudinal section of vertebral bodies D10 and D11. Then the patient was changed in prone position. Approach from T7 to L 2. Placing pedicle screws T7 to L2 on the right side, and T7-T8, T12 and L2 on the left. Dissection of ribs T9, T10 and T11 left. Costal arch section approximately 5 cm ostovertebral joint. Laminectomy from T11 to T9 corresponding to pedicles. Constales ligation cups T9 and T10 as well as nerve roots T9 and T10. Oblique osteotomy to match them with previous osteotomy. Extraction block tumor more and T10 vertebral Placing trabeculac body with allograft.Compression bars.
Conclusion
First postoperative days are spent in the ICU, where he presented favorable evolution. Early extubation with good clinical tolerance and blood gases. Serohematic chest tube drainage without air leak. Drain scarce and serohematic drenage.

Then the patients presented good clinical evolution. Regular medication is started. Edema and erythema of injury evidence dorsal region, performing cures culture of the sample is taken and antibiotic therapy begins with 3rd generation cephalosporins. Standing starts and then starts walking.

Keywords : Dorsal corpectomy, mediastinal angiosarcoma, vertebral invasion
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Dysplasia epiphysealis hemimelica-Clinical manifestation and therapy of Morbus Trevor

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Submitted by : Christina Wack the 2016-02-22 21:59:36
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

Introduction
Dysplasia epiphysealis hemimelica or Morbus Trevor is a rare disease with an incidence of 1:1million. The disease is characterised with benign osteocartilaginous tumours of the epiphysis. The tumour occurs preferably at the lower limb, typically at one side of the epiphysis. This osteochondroma is growing from the epiphysis and can destroy the joint area, so it is different to the cartilaginous exostosis. The disease leads to limitations in movement, pain, leg length differences and deformities. The etiology is until now unknown. Up to date there is no evidence of a hereditary genesis. The relation of boys to girls amount to 3:1. A statement with respect to articular malposition and its consequences is not possible so far. We report about 12 cases in our department with regard to clinical symptoms, therapy and progress.

Methods
Between 1999 und 2014 we examined 12 patients with a Dysplasia epiphysealis hemimelica. The Classification of Azouz et al. is being used. Examined were initial symptoms, classification, affected joint, side, age, therapeutic intervention, progress and complications.

Results
We see 8 boys and 4 girls. The main age was 8 years at diagnosis. In our 12 patients were 5 patients who initially had multiple symptoms. Primary symptoms were in over 50% of the patients swelling, 2 patients indicated pain, a deformity occurred in 3 patients. A limitation of movement was seen in 4 patients. Mostly pain was indicated at the age of 8 to 13. In two cases the diagnoses was an incidental finding after a sprain. The talus was the most frequent localization, followed by the distal tibia. In one case we saw an incidence of both sides at the femoral condyle, which could treated conservatively. In all the other cases a surgical intervention was necessary, partly with multiple interventions.

Conclusion
The Dysplasia epiphysealis hemimelica (M. Trevor) is rare and shows an overshoot growing of osteocartilaginous area in epiphysis. This runs the risk of premature closure of the epiphysis, malposition, destruction of the joint area and resultant prearthrosis.
Routine controls of the growth of patients with a M. Trevor are required, particularly until the end of growth, but also beyond that, to prevent deformities and prearthrosis.

Keywords : Dysplasia epiphysealis hemimelica, Morbus Trevor, osteochondroma, osteocartilaginous tumour
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Early Clinical Results using a Biphasic Bone Graft Substitute after Intralesional Curettage in Benign Bone Tumors or Cysts

Abstract ID : 1454
Submitted by : Peter Horstmann the 2016-02-22 10:33:27
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives
Intralesional curettage is the most common surgical treatment for benign bone tumors, but management of the subsequent bone defect varies greatly. Bone grafting with autogenous cancellous bone is still considered the gold standard, but for larger defects the use of bone autografts has now widely been replaced by cancellous allografts, bone cements or bone graft substitutes. Cancellous allografts have until recently been used for larger bone defects at our center, but partly due to shortness of supply and partly to avoid risks potentially associated with the use of allograft, we have started to use an artificial bone graft substitute for filling bone defects in an increasing proportion of cases. The aim of this study is to evaluate the early clinical results using this product.

Methods
We prospectively reviewed 22 consecutive patients (F/M: 11/11, mean age 29 (7-68 years)) who underwent intralesional curettage of 23 benign or borderline bone tumors or cysts in the appendicular skeleton with subsequent bone defect reconstruction with a biphasic (60% calcium sulfate/ 40% calcium phosphate) bone graft substitute (CERAMENT™|BONE VOID FILLER (BVF)) or a biphasic gentamicin eluting bone graft substitute (CERAMENT™|G) at our orthopedic oncology center from July 2014 until August 2015 giving all patients a minimum of 6 months follow-up. We recorded histology, size and anatomic region of the bone tumors, choice of treatment, postoperative complications, radiographic changes, and local recurrence rates.

Results
The most commonly treated lesions were uni- or multicameral bone cysts (n=8) and enchondromas (n=5) with an average size of 12 (2-33) mL. The most commonly affected regions were the proximal femur (n=6), and the proximal humerus (n=5). CERAMENT™|BVF was used in 17 cases and CERAMENT™|G was used in 6 cases with an average amount of 12 (2-56) mL. Nine patients were allowed immediate free mobilization, while the remaining was allowed free mobilization after an average of 13 (2.5-39) weeks judged by a combination of radiographs and clinical examination. Six patients were not allowed full weight bearing after the operation, but achieved this after 4.4 (2-8) weeks. Radiographic evaluation of the biphasic material showed signs of resorption in all cases visible from around 6 weeks, and in 1 case the material leaked into the soft tissue creating a transient soft tissue calcification that disappeared before the 6 months evaluation. Eighteen patients experienced no postoperative complications, while 4 patients had 5 complications (1 fracture (after relevant trauma), 1 superficial infection, 1 deep venous thrombosis, 1 delayed wound closure (>7 days), and 1 transitory nerve palsy). Three patients developed local recurrence (2 Giant Cell tumors and 1 non-specific lesion) after 6.7 (3.4-9.90) months.

Conclusion
In this small prospective series of 22 patients, treated for benign bone tumors or cysts in a single orthopedic oncology center, we found that intralesional curettage and bone defect reconstruction with a biphasic bone graft substitute seems to produce clinical results comparable with our conventional treatment with cancellous bone allografts and a low rate of product related postoperative complications.

Keywords : Benign Bone Tumors, Curettage, Bone Defect Reconstruction, Bone Graft Substitute
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Efficacy and safety of anthracycline-based regimen for soft tissue sarcomas in elderly patients

Abstract ID : 1198
Submitted by : Kayo Suzuki the 2016-02-11 04:30:35
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Most of soft tissue sarcomas (STS), as spindle cell sarcomas, occur predominantly in elderly patients, over the age of 65 years. However, the treatment of advanced STS with locally relapsing disease or distant metastasis still remains debatable on chemotherapy. Moreover, few data are available on efficacy and safety of adjuvant chemotherapy when indicated in elderly patients with advanced STS. In our institution, the patients of advanced STS have been received chemotherapy with the reduced dose of drugs according to estimated Glomerular Filtration Rate (eGFR). The purpose of this study is to investigate the efficacy and safety of adjuvant chemotherapy with anthracycline-based regimen [mesna, adriamycin (20 mg/m2), ifosfamide (2.5 g/m2) and dacarbazine (300 mg/m2), MAID] for STS in the elderly patients compared with the adolescents.
Materials and Methods: This study was enrolled 15 patients (10 males, 5 females; median age 57 years) of STS and treated with adjuvant chemotherapy by MAID in our institution between 2008 and 2015 (median follow-up 16 months). Histological diagnose were 4 synovial sarcomas, 4 undifferentiated pleomorphic sarcomas, 2 liposarcomas, and 5 others. Adjuvant chemotherapy was indicated if patients already had distant metastasis, a high-risk of recurrence, and no severe comorbidity. The patients divided into two age groups, younger group (9 cases, less than 65 years old) and older group (6 cases, over 65 years old). We evaluated the dose of drug, the number of cycles, the modality and incidence of adverse event, chemotherapeutic response rate and overall survival (OS) compared with younger and older group. Adverse event was evaluated according to the National Cancer Institute Common Terminology Criteria for Adverse Events (CTCAE) version 4.0. Comparison in two groups was analyzed by using the Fisher exact test and Kaplan-Meier method.
Results: All cases in younger group were administered at 100% of planned dose and 5 cases (83%) in older group reduced 50-80% of planned dose according to the eGFR. The average number of received cycles was 2.5 in younger group and 3 in older group, with no significant difference. Grade 3-4 neutropenia was 8 cases (89%) in younger group and 1 (17%) in older group. Grade 3-4 nausea was 7 cases (78%) in younger group and 1 (17%) in older group. The frequent of neutropenia and nausea was significantly higher in younger group than older group (p=0.01 and p=0.036, respectively). Response rated showed 1 PR, 1 SD and 6 PDs in younger group, and 3 PRs and 3 PDs in older group. The 2-year OS rates in younger and older group were 60% and 74%, with no significant difference.
Discussion: There is not clear consensus on the indications and effectiveness of chemotherapy in elderly patients. By reducing the dose of drug for elderly patients, we could decrease severe adverse events. Moreover, the elderly patients with STS might get the efficacy that is not to be inferior to a younger patient.

Keywords : advanced soft tissue sarcoma, anthracycline-based chemotherapy, elderly patients
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ELASTOFIBROMA DORSI: CLINICAL EVALUATION OF 61 CASES AND REVIEW OF THE LITERATURE

Abstract ID : 1277
Submitted by : mehmet ali deveci the 2016-02-14 12:12:20
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Abstract
Introduction: Elastofibroma dorsi (ED) is a rare, benign soft tissue tumor typically located between the inferior corner of the scapula and the posterior chest wall causing mass, scapular snapping and pain. With the classical symptoms and localization it is diagnosed without biopsy and treated with marginal resection.
Objectives: This study retrospectively analyzed the patients operated due to ED to evaluate the presenting symptoms, tumor size, complications, and clinical results and to suggest optimum treatments.
Materials and Method: This study included 51 patients operated due to ED in 2 different clinics between 2005 and 2015. The patients' age, gender, side, symptoms, average duration of symptoms, tumor sizes, and professions were investigated. The radiological examinations of the patients were evaluated. The patients with lesions bigger than 5 cm were operated. The postoperative complications, recurrences, and functional results were evaluated using Constant score.
Results: A total of 61 operated lesions of 51 patients clinically and radiologically diagnosed with ED were retrospectively evaluated. The average symptom time was 11.21 months. The lesion of 19 (37.2%) patients was bilateral. However, 10 of the symptomatic patients with lesions bigger than 5 cm were operated. The average lesion diameter was 8.7 cm. The average follow-up was 26.89 months. The Constant score was 67.28 before operation and raised to 92.88 ($p < 0.05$). Seroma and hematoma were observed in 11.5% of the patients.
Conclusion: Generally, good clinical results can be obtained with marginal resection without requiring a biopsy, considering the classical complaints and radiological appearance of ED.

Keywords : Key words:, Elastofibroma dorsi, marginal resection, complications
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En bloc resections for primary and metastatic spine tumors in 5 years of experience.

Abstract ID : 1389
Soumis par : Alex Araujo Le 2016-02-19 23:24:59
Nom de la catégorie : Others
Typologie : Poster
Statut : validé
Autorisation de diffusion : Yes/Oui

Introduction:
The technical aspect of surgeries for the treatment of neoplastic conditions in the spine has improved in recent years. With the improvement of reconstruction techniques available nowadays, the principles of oncologic surgery described by Enneking could be applied to vertebral tumors. The en bloc vertebrectomy follows the free margin preservation principle with wide resection and sacrifice of some important structures, in order to cure or to enable local control of the disease. Despite all the advances in the technique, the number of related complications and the interference of the consequences in the patients' quality of life have been the subject of much discussion in the literature. Due to the spread and improvement of the technique, there have been more and more papers on experiences and associated complications that enable a better understanding of the surgery and its indications.

Purpose:
The primary objective of this study was describe our experience regarding en bloc vertebrectomy in the thoracic and lumbar spine at the Instituto do Câncer do Estado de São Paulo [ICESP] between 2010 and 2015.

Methodology:
Retrospective study held at ICESP of data obtained from the medical records of patients treated between 2010 and 2015.

Results:
From 2010 to 2015, 16 patients underwent en bloc vertebrectomy. The patients had different types of tumor, 9/16 [56%] metastatic lesions, 4/16 [25%] aggressive benign lesions and 3/16 [19%] primary malignant lesions of the spine. The vertebrectomies were carried out in two different ways - single posterior approach or anterior and posterior approach; 10/16 [63%] patients underwent vertebrectomy through the isolated posterior approach, while 6/16 [37%] underwent the procedure through the anterior and posterior approach. The complication rate was 50%% [8/16] and the problems occurred both during the surgery and/or after the surgery. All of them required a new surgical procedure. The average survival after surgery was 22,5 months. Considering the cases of metastatic disease and those of localized disease, we observed a median survival of 15 months for patients with metastatic lesion, and 34 months for patients with local disease.

Conclusion:
En bloc vertebrectomy is a highly complex procedure that has been improved in recent years. As its indication is limited, few centers in the world perform this type of surgery. These two factors have an impact on the learning curve, and the degree of complexity and rarity of this procedure restricts its realization practically to centers specialized in major cancer surgery. The Instituto do Câncer do Estado de São Paulo [ICESP] was founded in 2008, and over the years, due to its technological improvement and the increase in the number of cases, it has been possible to develop protocols for conducting en bloc vertebrectomies.
The average survival rate found for patients with metastatic disease was considered satisfactory as was the survival rate for patients with localized disease. The high rate of postoperative complications is still the major obstacle to en bloc vertebrectomy indications, and a challenge to be overcome.

Mots clefs : total vertebrectomy, spine tumors, en bloc resection, complications, classification system
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En-blocc sacrectomy performed previous anterior robotic approach: preliminary experience

Abstract ID : 1056
Submitted by : Carmine Zoccali the 2016-01-11 16:18:00
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: en-bloc sacrectomy is a high demanding surgery necessary to obtain wide margin in sacral tumor. Sacral metastases are frequent but in the most of cases the approach is conservative; otherwise surgery is the mainstay treatment in primitive lesion.
It can be performed by only posterior approach or by a previous anterior preparatory approach where the tumor mass is separated from the rectum and, when necessary, the internal iliac vessels identified and bounded; the anterior approach makes following posterior approach safer.
The double approach is usually preferred for tumors extending proximally to S3 level where iliac internal vessels are at higher risk for damaging during posterior surgery.
Our intent was to apply robotic-assisted techniques in anterior preparatory approach for sacrectomy.
Patients and Methods: from 2010 to 2014 three cases of sacrectomies were performed previous robotic-assisted preparatory approach to separate the rectum from the tumor. The cases were analyzed; the surgical technique and the preliminary results reported.
Results: dissections were successfully performed in all cases quite until the pelvic floor; the surgeon was able to position a Gore-Tex spacer between the anterior tumor surface and the rectum in all cases. The anterior dissections were performed with a perfect control of the bleeding. No complications related to the anterior approach were reported.
Conclusions: Robot assisted surgery can be considered a valid minimally invasive technique which allow a safe anterior dissection of the pelvic structures dividing tumors from surrounding tissues. It allows to place a spacer to protect organs during posterior sacral resection performed during the same day or after. Further experiences are advocated to value its efficiency in sacral tumors of major size.

Keywords : en-bloc sacrectomy; wide margin, sacral cordoma, robot surgery
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Supplementary material : http://sites.altilab.com/files/122/abstracts/pc-emsos.docx, http://sites.altilab.com/
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Endometrial adenocarcinoma recurrence presenting with tibial metastasis: report of a case

Abstract ID : 1416
Submitted by : MEHMET SOYLEMEZ the 2016-02-21 19:04:17
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Endometrial adenocarcinoma is one of the gynecological malignancies which tends to occur in postmenopausal women. İrregular uterine bleeding is usual clinical presentation of these adenocarcinomas. Malignancies originating from uterine tissue can metastase to several organs but they mostly metastases to lungs and liver. Metastasis to skeletal system is rare and mostly have been reported to be in axial skeleton Metastasis to perpendicular skeleton is a rare and extraordinary situation. Metastasis to perpendicular skeleton constitutes 0-8% of all endometrial adenocarcinoma metastases. Herein a case of endometrial adenocarcinoma recurrence that presented with symptoms of tibial metastasis is described.
Case
59 year-old woman admitted to our orthopaedic oncology clinic with pain, swelling and tenderness at right cruris for two weeks. She had no any ather complaint. Her medical history indicated that she had a total abdominal hysterectomy and bilateral salpingo oophorectomy with diagnosis of endometrial adenocarcinoma followed by chemotherapy two years ego. During follow-ups no recurrence had been detected. Initial X-rays of the right tibia showed a 3x1,5cm lytic and expansile mass located at the shaft of the tibia suggesting metastasis (Figure 1). MRI images demonstrated contrast enhanced 3x1,5 cm medullary expansile lesion surrounded by bone eudema. A whole body PET/CT was perfomed to detect any other metastasis. Howevere PET/CT imaging didn't demonstrated increased FDG uptake at any other location. A true-cut biopsy was planned and sections revealed adenocarcinoma consistent with a primary endometrial tumor.
A wide resection of the lesion with clear margins was performed two weeks after first admittance. Resected area was replaced by fresh frozen femoral shaft allograft and was fixed with İntramedullary nail and plate. Osteotomy lines was supported by impacting autogreft obtained from ilaic crest. The patient underwent additional adjuvant chemotherapy. At postoperative 3. Month weight bearing was allowed and no reccurence was detected at postoperative 12. month. X-rays obtained at last follow-up demostrated fully healing at resection site(Figure 2).
Discussion
Patients with advanced or recurrent endometrial cancer often have distant metastases found within the lymph nodes, liver, and/or lung. However, there have been reported cases of primary endometrial cancer with metastasis to the bone. Bone metastasis are mostly seen as recurrence and survival is better when compared to those who sustained bone metastasis at primary diagnosis.
Bone metastases are mostly seen in vertebral column and pelvic ring because of batson venous plexus which drains periuterin and paravertebral region. However, in rare cases metastasis to talus, calcaneus, tarsus and femur have been reported. Up to now eleven cases with tibial metastasis at primary diagnosis have been reported. But as far as we know, this is the first case reporting endometrial adenocarcinoma recurrence presenting with tibial metastasis.
Conclusion
Malignancies originating from uterine tissue rarely metastasis to perpendicular skeleton. But as seen in our case it can even present with syptoms of metastasic disease. Management strategy is the same as other malignant bone metastasis. Endometrial adenocarcinoma must be kept in mind as a differential diagnosis in malignant bone metatasis.

Keywords : Endometrial adenocarcinoma, metastasis, recurrence, tibia
Authors :
References : , , ,

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Enhancing precision and accuracy in bone tumour treatment; an experimental comparison of freehand, computer assistance (CAS) and a novel universal CAS saw guide.

Abstract ID : 1425
Submitted by : Paul Jutte the 2016-02-21 21:59:56
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background
Better knowledge of tumour biology, multimodal treatment and advances in imaging and surgical technology have enabled a trend in orthopaedic oncology to save more healthy tissue while safely removing the tumour. Hemi-cortical (or multiplanar) bone tumour resections and reconstructions are however demanding procedures. The technique depends on high surgical accuracy to achieve an oncological safe resection and it is associated with complications such as fractures.
Recent developments show that Computer Assisted Surgery (CAS) can be used to simplify the creation of highly accurate allograft by exactly duplicating the used tumour resection paths. However CAS only provides intra-operative feedback as it just helps in orientation, the resection is still performed free-handed.

Study design

An experimental study was performed. A distal femoral cadaver bone-tumour model was chosen to accurately simulate a real procedure. Six Thiel-embalmed cadavers were used. The surgical plan was to resect a virtual tumour in the one femur and to reconstruct the defect with a graft resected from a matching femur. Pre-operative and post-operative imaging, together with surgical planning software, provided both a surgical objective and offered high-resolution measurements. A high grade sarcoma was simulated in each of the three tumour resection specimens, on the anterior side of the distal femur. Reconstruction accuracy was measured on coronal slices by measuring the length of the gap between the centres of the cortices of the graft and host bone every 2 mm.

Results
Three procedures had intra-lesional resections, the two freehand procedures and one of the CAS procedures Point-measured resection accuracy was lowest in the freehand procedures (6.1 and 4.0 mm), good in CAS (3.9 and 3.2 mm) and highest in the two CAS guide procedures (3.0 and 1.2 mm). Achieved graft volume compared to the planned graft volume, was lowest in the freehand group (45% and 68%) and highest in the CAS-guide procedures (76% and 99%). The mean reconstruction gap was largest in the fluoroscopy cases (2.3 mm, 1.9 mm), with the lowest in the CAS (1.5 mm, 1.2 mm) and CAS guide procedures (1.3 mm, 1.1 mm). Plane smoothness (precision) was lowest in the freehand procedures and highest in the CAS-guide procedures.

Discussion
The result of this experiment underlines the observation that these types of multi-planar resections are very demanding. None of the six resections, even with imaging support, achieved the exact required margin. All resections resulted in cuts that were too conservative, i.e. cuts with less than 10 mm margin surrounding the tumour. Three procedures (2 fluoroscopy cases, 1 CAS) even had a local error of over 10 mm, resulting in intra-lesional resections. Possible CAS matching errors resulted in the intralesional resection. While the optimum result was not achieved, a clear trend in resection and reconstruction accuracy is visible in the results. Achieved resection accuracy for CAS was comparable to literature. CAS-guides did slightly better.

Keywords : Accuracy, Computer Assited Surgery, Intraoperative Guide
Authors :
References : , , ,

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Evaluating the influence of unplanned excisions in soft tissue sarcomas on therapy and patient's survival.

Abstract ID : 1092
Submitted by : Maria Anna Smolle the 2016-01-26 12:59:11
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives

Soft tissue sarcomas (STS) occur seldomly, and if they do, their clinical presentation is heterogenous, increasing the risk of unplanned excisions (UEs). These "whoops"-procedures are often associated with residual tumour cells requiring re-resection and extensive surgery. The aim of this study was to determine the influence of UEs on further treatment and patient's survival.

Methods

427 patients referred between 1998 and 2015 were included into the study. 215 were male and 212 female. Statistical analysis was carried out using SSPS Version 22.0. A two-sided p-value less than 0.05 was accepted as statistically significant. Patient-, tumour- and treatment-related characteristics were compared between UE-patients and directly referred ones. For survival analysis, patients with primary metastasis and amputation were excluded, resulting in 376 patients eligible.

Results

38.6% of patients had undergone prior UEs (n=165). Subsequently, all patients underwent definite surgery at our department. Limb-salvage surgery was not feasible in 35 patients. Patients with UEs required plastic reconstructions ($p<0.005$) significantly more often, but less often prosthetic devices ($p=0.009$) or amputations ($p=0.048$).
A different prognosis between patients with prior unplanned excision and directly referred ones was neither present in univariate ($p=0.117$) nor multivariate analysis ($p=0.146$).
For directly referred patients only, multivariate analysis revealed high-grade tumours ($p<0.005$; HR: 3.827; 95%CI: 1.965-7.453) and age over 60 years ($p=0.009$; HR: 2.223, 95%CI: 1.217-4.063) as independent negative prognostic factors. In patients with prior UE, a duration of symptoms less than 6 months ($p=0.020$; HR: 0.347, 95%CI: 0.142-0.849), high-grade tumours ($p=0.007$; HR: 4.791, 95%CI: 1.526-15.036) and local recurrence ($p=0.002$; HR: 4.867, 95%CI: 1.764-13.422) were associated with a worse prognosis in multivariate analysis.

Conclusion

Overall-survival was not significantly different between UE-patients and directly referred ones. In multivariate analysis calculated separately for each group, different prognostic factors emerged. Although local recurrence was not associated with a decreased OS for directly referred patients, it significantly reduced the prognosis of UE-patients.

Keywords :
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Evaluation with MR imaging in therapeutic response of soft tissue sarcomas

Abstract ID : 1230
Submitted by : Valeria Martinelli the 2016-02-12 13:35:57
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

The purpose of this study was to evaluate the response to neoadjuvant chemotherapy in soft tissue sarcomas through the application of RECIST and Choi criteria compared with each other and through the use of DWI and DCE functional sequences , with ADC parameters , IAUGC and kTrans and also with PET - CT examination .

Between June 2012 and December 2014 we were enrolled 12 patients (8 males and 4 females) aged between 25 and 66 years. All patients underwent PET - CT and MRI study before and after chemotherapy treatment going to evaluate specifically by applying of DWI and perfusion , the SIR (Signal Intensity Ratio) , the ADC and processing of perfusion maps .
Based on the results obtained , all patients were divided according to response to therapy in Good Responder (R) and Non Responders (NR) .

The study has highlighted the limitations of the RECIST criteria in the assessment of responder patients (sensitivity 25 %) and the superiority of CHOI criteria in the same category of patients (sensitivity 100 %) .
The reduced sensitivity of the ADC (25 %) in Patients Responders for overlap of hemorrhagic phenomena .
The limits of the KTrans assessment (sensitivity 50 %) and good PET - CT results (sensitivity 66 %) and MRI perfusion iAUGC (sensitivity 50 %).

Keywords : Soft Tissue Sarcomas, MRI criteria , response to neoadjuvant chemotherapy
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Ewing sarcoma of the proximal femur misdiagnosed as acute osteomyelitis for 4 years.

Abstract ID : 1321
Submitted by : Stéphane Cherix the 2016-02-15 15:16:29
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Ewing Sarcoma can clinically and/or radiologically mimic other pathologies, including typically (sub)acute osteomyelitis. A delayed or wrong diagnosis may have dramatic consequences for the patient.
We report the case of a 24 years old patient whose Ewing sarcoma of the proximal femur misdiagnosed as acute osteomyelitis 4 years earlier.

Case presentation:
A 24 years old patient presented at emergency room with haemoptysis. Chest plain film revealed multiples bilateral opacities. Extensive workup showed multiple mediastinal, pulmonary and pleural masses, retroperitoneal and inguinal adenopathies as well as a right femoral mass.
Four years earlier, the patient had been complaining of prolonged pain in the right proximal thigh, during both activities and rest. No fever was objectified, but the patient felt sweat. A light inflammatory syndrome was present (CRP was 22 mg/l and leucocytosis 15.9 G/l). Imaging (plain film, MRI and CT) was considered as consistent with acute osteomyelitis. Ewing sarcoma was evoked as a potential differential diagnosis. Surgical trepanation and sampling did not reveal any germs. No pathologic analysis was performed.The patient was treated for acute osteomyelitis of unknown origin, with transient improvement of the symptoms. After one year, the patient was lost to follow-up, until he presented at emergency room with haemoptysis. He had never been able to walk on full weight-bearing for the past 4 years.
Transbronchic and femoral biopsies confirmed the diagnostic of stage IV Ewing sarcoma of the right proximal femur. The patient was treated according to Euro-Ewing protocol with 6 cycles of neoadjuvant chemotherapy, followed by „en bloc“ resection and reconstruction with tumoral hip arthroplasty, 6 cycles of adjuvant chemotherapy and pulmonary radiotherapy (18 Gy), with an excellent clinical but poor pathological response to treatment (60% viable cells).
At the end of the treatment, there was no evidence of residual disease.

Discussion
Ewing sarcoma is a highly malignant tumour, for which early diagnosis is a key prognostic factor. The actual five-year survival rate for patients with localized disease is 65-75%, while it is under 30% for those with metastases at diagnosis.
Considering the present case, and in order to prevent such dramatic diagnosis failure, one should put in doubt the diagnosis of osteomyelitis when no germ is identified on sampling, even though around 10% of bone infections are of unknown origin. Reconsidering the diagnosis and performing new sampling should be discussed.
Another critical point is the necessity to send material for pathologic analysis even when a biopsy is performed in the setting of suspicion of bone infection..
If any doubt remains, difficult cases should be discussed in tertiary centres, where multidisciplinary teams (sarcoma centres) are available.

Keywords : Ewing sarcoma; misdiagnosis; acute osteomyelitis
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Examination of survivin expression in 50 chordoma specimens – a histological and in vitro study

Abstract ID : 1086
Submitted by : Birgit Lohberger the 2016-01-25 09:09:44
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Chordomas mainly arise along the axial skeleton and are characterized by their slow but destructive growth. Prognosis and quality of life are poor because treatment options are mainly limited to surgery and radiotherapy. Survivin (baculoviral IAP repeat-containing 5, BIRC5), a member of the apoptosis inhibitor protein family, functions as a key regulator of mitosis and programmed cell death, and is overexpressed in many tumor types. The aim of this study was to determine the role of survivin in chordomas.
Materials/Patients and methods: Survivin expression was investigated in 50 chordoma samples and three chordoma cell lines using immunohistochemistry. The intensity of immunostaining was evaluated in regard to the development of recurrences. The immunohistochemical results were correlated with clinical parameters like gender, age, tumor size and location and were performed in primary chordomas as well as in recurrent lesions. Furthermore, survivin knockdown experiments on chordoma cell lines were performed. Results: The resultant data from this study suggest that survivin plays a cell cycle-progressive role in chordomas. The survivin inhibitor YM155 decreased the growth behavior of chordoma cells dose- and time dependently. Transient knockdown of survivin led to a G2/M arrest, decreased proliferation, consistently induced an increase of polyploidy and morphological changes, and induced apoptosis. Conclusion: Hence, regulation of survivin by YM155 is a promising new target for the development of new therapeutic drugs.

Keywords : chordoma, survivin, YM155, cell cycle
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EXPANDIBLE ENDOPROSTHESIS IN CHILDREN AND ADOLESCENS AFTER MALIGNANT TUMOUR RESECTION – OWN EXPERIENCE.

Abstract ID : 1070
Submitted by : Andrzej Szafranski the 2016-01-13 00:04:31
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

In the period 2000-2014 185 children with primary bone tumors were treated. They were 102 boys and 83 girls. The age of the patient was from 4 to 25 years old. Median was 13 yrs. old. The treatment was begun from neoadjuvant chemotherapy. After achievement the regression or stabilization of primary lesion, the patients were qualified to surgery procedures. It was excision of the tumor end reconstruction by the using of the expandable endoprosthesis in spite of young age of the patients. After that adjuvant chemotherapy was used with or without metastasis treatment.
In this study the own department experience in implantation of variety types of expandable endoprosthesis were shown. The defects and advantages of each type of expandable endoprosthesis were introduced. The all data were displayed as peer analysis of the patients with variety types of endoprosthesis.
As the summary the authors published the guidelines according the handling of, service the variety types of expandable endoprostheses.

Keywords : endoprosthesis, bone tumors, treatment
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Extent of surgery does not influence 30-day mortality in surgery for metastatic bone disease.

Abstract ID : 1121
Submitted by : Michala Skovlund Sørensen the 2016-02-03 09:05:46
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction/Objective: Estimating patient survival has hitherto been the main focus when treating metastatic bone disease (MBD) in the appendicular skeleton. This has been done in an attempt to allocate the patient to a surgical procedure that outlives them. No questions have been addressed as to whether extent of the surgical trauma reduces survival in this patient group.
Aim of study: We wanted to evaluate if perioperative parameters such as blood loss, extent of bone resection and surgical time was risk factors for 30-day mortality in patients having surgery due to MBD in the appendicular skeleton.
Methods: We identified 270 consecutive patients who underwent joint replacement surgery or intercalary spacing for skeletal metastases in the appendicular skeleton from 1st January 2003 to 31st December 2013. We collected intraoperative (surgical duration, extent of bone resection and blood loss), demographic (age, gender, American Society of Anaestesiologist' score (ASA score) and Karnofsky score) and disease-specific (primary cancer) variables. An association with 30-day mortality was addressed using univariate and multivariable analyses and calculation of odds ratios (OR). 30-day survival was estimated with Kaplan-Meier survival curves.
Results: 30-day survival was found to 88% (95%C.I.: 84% - 92%), see figure 1. ASA score 3 + 4 (OR 4.16 (95% C.I.: 1.80;10.85), p = 0.002) and Karnofsky performance status below 70 (OR 7.34 (95% C.I.:3.16;19.20) p<0.001)) were associated with increased 30-day mortality in univariate analysis. This did not change in multivariate analysis. No parameters describing the extent of the surgical trauma was found to be associated with 30-day mortality.
Conclusion: The 30-day mortality in patients undergoing surgery for MBD is highly dependent on the general health status of the patients as measured by the ASA score and performance status.
The extent of surgery, measured by surgery time, blood loss and degree of bone resection was not associated with 30-day mortality.

Keywords : Survival, Surgical Trauma, Bone Metastasis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1-30-day-survival.pdf, http://sites.altilab.com/
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EXTRA-ABDOMINAL DESMOID TUMOURS: SURGERY FIRST, WAIT AND SEE, MEDICAL TREATMENT? THE ISTITUTO ORTOPEDICO RIZZOLI EXPERIENCE

Abstract ID : 1055
Submitted by : Teresa Alexandre the 2016-01-10 14:45:58
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION
Desmoid tumors (DT) are benign but can have a high local recurrence causing significant morbidity and sometimes mortality. Several treatment modalities have shown benefit ranging from conservative, nonsurgical approaches to aggressive cytotoxic chemotherapy. The role and timing of surgery is now under discussion. In 2015 a consensus treatment algorithm by the EORTC Soft Tissue and Bone Sarcoma group was published where special emphasis was posed on the role of the wait and see policy.
METHODS
A retrospective analysis of all consecutive extra-abdominal DT pts diagnosed and treated at Istituto Ortopedico Rizzoli (IOR) between January 2000 and December 2014 was performed. Primary aim: characterize the clinical and treatment data from chart review. Secondary aim: to evaluate 3 and 5-years progression-free survival (PFS) and the related prognostic factors.

RESULTS
From a total of 169 pts, 105 (62%) were females and 64 (38%) were males. Of the total pts, 118 (70%) pts had not received any treatment before IOR and 51 (30%) were admitted after recurrence. Distribution by tumor location: extremity 82 pts (49%), girdles 49 pts (29%), head and neck 12 pts (7%) and trunk 26 pts (15%). Three percent of pts had multicentric tumors. The median size of the tumor was 7cm. Thirty pts (18%) had <5cm, 51 pts (30%) between 5 and 9cm, 39pts (23%) >10cm, and in 49pts (29%) the size was unknown. The majority of pts presented pain and other symptom and only 2 pts had no symptoms. The first treatment at IOR was surgery for 104 pts (62%), medical treatment including chemotherapy (MT&C) for 42 pts (25%) and wait and see (W&S) approach for 23 pts (14%). On the W&S group the pts had more frequently small tumors and the lesions were few symptomatic. Comparing to the EORTC consensus approach there were few pts using W&S as front-line and the surgery was the definitive treatment mostly used independent of tumor location. The PFS at 3 and 5-years for the pts with tumors <5cm was significantly better (91% and 84%) than for pts with tumors greater than 10cm (57% and 42%; p<0.02 respectively). The PFS at 3 and 5-years for the pts first treated at IOR with MT&C was 47% and 28%, with surgery 67.5% and 56%, and W&S 63% and 63% respectively with p=0.003. At the multivariate analysis size of the tumor (<5cm RR 1, 5-9cm RR 7.1, ≥10cm RR 7.4; p= 0.01), and surgery (W&S RR 1, MT&C RR 0.6, surgery RR 0.25; p= 0.006) were significant factors influencing the local control.

CONCLUSION:
The treatment for DT should remain as an individualized approach. The W&S as a first treatment is an option for a selected group of pts with non-aggressive disease. Nevertheless, for symptomatic pts the surgical treatment continues to be a valid choice allowing the better results in terms of progression free survival.

Keywords : desmoid tumor
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Supplementary material : http://sites.altilab.com/files/122/abstracts/extra-abdominal-desmoid-tumours-emsos-2016-sf-9-genn-2016-1.docx, http://sites.altilab.com/
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Extra-articular elbow resection and megaprosthetic reconstruction for osteosarcoma. A case report.

Abstract ID : 1485
Submitted by : Panayiotis Megaloikonomos the 2016-02-22 21:12:53
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: We present the interesting case of a young female with a remote history of acute lymphoblastic leukemia, who represented a second malignancy of the distal humerus; the patient was treated with wide extra-articular elbow resection and megaprosthetic reconstruction.
Case presentation: A 24-year-old female presented in our unit with pain and swelling of the left elbow. Her symptoms began about one month before presentation and were attributed to lateral epicondylitis (tennis elbow) at that time. Patient's past medical history was significant for acute lymphoblastic leukemia diagnosed at the age of 12 that was cured successfully with chemotherapy. X-rays and MRI of the left elbow demonstrated an osteolytic lesion of the distal humerus that was infiltrating the regional cortex and was expanding to the elbow joint. The patient underwent closed biopsy of the lesion that revealed classic osteosarcoma. Further evaluation for disease staging did not provide any evidence of metastasis. She was referred to Oncology for neoadjuvant chemotherapy that resulted in partial tumor ossification. The patient was then scheduled for an extra-articular elbow resection with megaprosthetic reconstruction. The tumor was resected en-bloc, while the regional nerves and blood vessels were retained. A splint was applied with the elbow in extension for 15 days, prior to initiation of physiotherapy. Adjuvant chemotherapy was also undertaken after surgery.
Results: The histological examination of the resected specimen confirmed the previous findings of closed biopsy and demonstrated tumor-free margins and 90% tumor necrosis. At the last follow-up, 25 months after surgery, the patient showed no evidence of local recurrence or metastatic disease. Hand sensation and motion were not impaired, while functional outcome of the elbow was acceptable.
Discussion: A second malignancy may not be seen as often, but should be always taken into account in long-term cancer survivors with suspicious lesions. Limb salvage surgery is possible for tumors about the elbow. Extra-articular elbow resection followed by megaprosthetic reconstruction represents an effective surgical technique with favorable elbow and hand functional outcomes.

Keywords : extra-articular elbow resection; megaprosthetic elbow reconstruction; elbow osteosarcoma.
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Extra-articular excision of the knee joint for locally advanced high-grade osteosarcoma of the distal femur is a safe procedure associated with lower functional outcome

Abstract ID : 1291
Submitted by : Eleonora Marini the 2016-02-14 16:53:54
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:

Extra-articular excision is usually considered necessary for local control of osteosarcoma invading the knee joint. Historically, this has been accomplished by en-bloc resection of the entire knee and extensor mechanism, although technical variants have been more recently described with the purpose of retaining at least part of the extensor mechanism and improve function. Little data exist in the literature on this subset of larger and locally advanced high-grade osteosarcoma requiring more extensive surgery than the more commonly performed routine intra-articular excision. In particular, questions of this study were:

1) Oncologic effectiveness and success rate in obtaining local control of the disease;
2) Functional outcome associated with the classical surgical technique and its variants;
3) Complications associated with the classical surgical technique and its variants;

Patients and Methods:

Twenty-two patients that underwent extra-articular excision for osteosarcoma (1991-2013) were retrospectively reviewed; 18 patients had stage IIB disease while 4 were stage III. Median age was 22 years (range 9–54). 11 patients (50%) were good responders (necrosis > 90%) and 11 patients (50%) poor responders (necrosis < 90%). At last follow-up 15 patients were AWD and 7 DOD. Median largest tumor dimension was 14 cm, longitudinal in all cases. Three different surgical techniques were compared: Classic: 5 patients (en-bloc resection of the extensor mechanism) - Modified: 11 patients (continuity of the extensor mechanism retained by coronal osteotomy of the patella) - Patellar Enucleation: 6 patients (circumferential arthrotomy of the patella and primary closure of the joint). Minimum follow-up was 2 years (average 7.5 years; median 4,5; range 2-18 years). Functional outcome was evaluated by MSTS score and range of motion, with emphasis on extension lag. Regression analysis, assessed by using Kruskal-Wallis H test, a rank-based, non-parametric test, was based on significant P-value ≤ 0.05. Implant survival and overall survival were assessed by Kaplan-Meier method.

Results:

No local recurrence at the last follow-up; overall survival was 63%.
Prosthetic survival was 80, 58, and 12 per cent at three, five, and ten years. Surgical complications rate was 60%; Infection was the most frequent cause of revision (36,8%), followed by aseptic loosening (27,7%), wear of prosthesis component (27,7%) and periprosthetic fracture (4,6%).
Average MSTS result was 24 (Classic 22, Modified 25, Patellar Enucleation 27 – p=0,33). Extension lag varied considerably in the 3 groups (Classic 68°, Modified 25°, Patellar Enucleation 3° – p=0,02)

Conclusions:

In this series, extra-articular excision of the knee for large and locally advanced high-grade osteosarcoma was associated with excellent local and proved to be an effective procedure in a less favorable subset of patients with larger tumor, joint invasion and large soft tissue involvement, and higher incidence (50%) of poor response if compared to other series. However, this procedure was associated with increased complication rate, inferior implant survival and function when compared to intra-articular excision. Patellar Enucleation demonstrated equally effective tumor control but less complications and significantly superior functional outcome compared to Classic and Modified technique.

Keywords :
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EXTRA-AXIAL CHORDOMA IN POPLITEAL FOSSA

Abstract ID : 1387
Submitted by : LAURA TRULLOLS the 2016-02-19 18:56:58
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Chordoma is a rare malignant tumour, which arises tipically in the axial bones from remnants of the embryonic notochord. Chordomas may develope outside the axial skeleton, but they are exceptional. We present an inusual case of extra-axial chordoma (EAC) in popliteal fossa.

CLINICAL CASE
Female 60 years-old, who complains about swelling, pain and growing mass in popliteal fossa of the left knee.
The MRI reported the presence of encapsulated cystic lesion about 5cm near to popliteal vessels with small bone destruction of the lateral condyle surface.
We performed a core needle biopsy, and it revealed a tumour composed of large epithelioid or polygonal cells with clear or vacuolated cytoplasm and atypical vesicular nuclei. Immunostains for pan-keratin and epithelial membrane antigen (EMA) were diffusely positive but S-100 protein, inhibin, Melan-A and PAX-8 were negative. However, there was multifocal striking nuclear positivity for brachiury. In these circumstances, given the abscense of any evident primary lesion elsewhere, these findings would fit best with an extra-axial chordoma (EAC).
The treatment was tumour resection and post-operative radiotherapy because of the marginal margin near the popliteal vessels.
Eleven months after surgery, a 2.5cm soft tissue mass appeared on the posterior aspect of the external tibial plateau, close to external popliteal sciatic nerve. The imaging was highly suspicious for chordoma distal recurrence. The patient was operated and the pathological findings confirm the diagnosis of EAC. A CT scan showed no sign of systemic dissemination.

DISCUSSION AND CONCLUSIONS
A small number of tumors show histological resemblance to axial chordoma, but they arise from the bone or soft tissue outside the axial skeleton. Brachyury immunohistochemical staining is a sensitive and specific marker for notochordal origin, that allows more accuracy diagnosis for EAC distinguishing them from parachordoma, which resembles chordoma on histology. The distinction between EAC and parachordoma is clinically important because EAC confirmed by immunoreactivity for brachyury tends to grow and recur with local bone destruction.

The preferred treatment for patients with extra-axial chordoma is radical surgery, combined with radiotherapy in cases with marginal margins in tumour resection specimen. The role of chemotherapy is unclear.
Survival, recurrence and rates of metastasis are unknown because of the rarity of this condition. However, it is known that the tumour may recur after many years (16% between 3-36 months after excision) and that it could metastasize (5%).

Keywords :
Authors :
References : , , ,

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Extraarticular knee and shoulder resections. Clinical and functional outcome

Abstract ID : 1250
Submitted by : EDUARDO ORTIZ-CRUZ the 2016-02-13 19:01:36
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION: Limb-sparing surgery has become the standard surgical treatment for malignant bone tumors. The patients who have intra-articular involvement need an extra-articular limb sparing surgery to prevent the amputation. We study the result of the limb sparing surgery in this small group of patients to determine differences in clinical and functional outcome compared to the intra-articular standard resection.
PATIENT AND METHODS: We conduct a retrospective study of the extra-articular joint resection with oncological purpose between 2011 and 2014 in a single center. One of the authors reviewed the computerized chart and evaluated the patients each 3 months for 2 years and then each 6 months. During this period, we performed 28 knee, shoulder, pelvis and ankle extra-articular resections as a treatment of bone or soft tissue tumors. 21 of them were located in knee or shoulder areas. The knee extra-articular resection was indicated when the tumor involve the joint or affects the extensor mechanism. The extra-articular procedure in the shoulder was performed if the tumor involves the rotator cuff, or invades the gleno-humeral joint or capsule. Median age was 25, 18 years old (range, 9-76 y.o). The most frequent diagnosis was osteosarcoma and the more prevalent location was the proximal humerus. Minimum follow-up was 12 months and the medium follow-up was 22 months
RESULTS: 12/22 patients are alive with no evidence of disease (ANED), 1 /22 is AWD. Of the 22 patients 8 died of disease and 1 died because of a leukemia secondary chemotherapy. Twenty of the 22 patients had a wide resection. The deep infection rate was 9.5%. 2 /22 patients had an implant failure and 2 patients had a quadriceps tendon rupture. 3/22 patients had a local recurrence and all of them are died of disease. Median functional scores (according to MSTS functional and emotional scale) with 1 year of follow-up was 20 for knee procedures and 22, 8 for shoulder surgeries.
DISCUSSION / CONCLUSION:
Our results suggest that extra-articular resection can be an alternative for primary amputation. It is a technical demanding procedure with acceptable local recurrence rates in our series. The local recurrence after this procedure is not different to other limb salvage techniques. However, these patients had in general poor survival.
Level of evidence IV (Case series)

Keywords : BONE TUMOR, SOFT TISSUE TUMOR, LIMB SALVAGE, BONE TUMOR RESECTIONS, EXTRAARTICULAR RESECTION
Authors :
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Extrabdominal endometriosis in hip adductor compartment.

Abstract ID : 1192
Submitted by : Oscar Buezo Rivero the 2016-02-10 20:35:02
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Endometriosis is a proliferation of endometrial tissue outside the uterine cavity. The most common location is intraabdominal. We present a case of extraabdominal endometriosis, in adductor compartment.

51 y.o. female patient consulted for right inguinal pain for years in relation with menstruation. MRI showed solid tumour (27x60mm) in adductor compartment. Biopsy TC – guided was performed, reporting endometrial tissue without atypical cells.

Ginecological department was consulted, recomending conservative treatment with dienogest. Currently, after 3 years of follow up, patient is almost painless, and MRI demonstrated stabilization of size tumour.

Endometriosis is an heterogeneous disease, being extrabdominal location very unusual. The main symptom is pain in relation with menstruation, that can be very invalidant. Usually, endometriosis creats fibrosis reaction around focus and malignation is extremelly uncommon. This is the reason for trying conservative treatment, keeping surgical resection only for rebel cases.

Keywords : Endometriosis, extrabdominal tumour,
Authors :
References : , , ,

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EXTRACORTICAL TRIPLATE FIXATION FOR TUMOR PROSTHESIS (BIOMECHANICAL STUDY)

Abstract ID : 1430
Submitted by : Oleg Vyrva the 2016-02-21 22:49:56
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. The one of the most common complications of tumor prosthesis replacements (TPR) are prosthetic stem fractures (1,6-18,2% of total number TPR) and periprosthetic fractures (0,7-8,1% of total number complications). These complications are related uneven load on the different elements of the "endoprosthesis – bone" system. Maximal peak of load is on base of the endoprosthesis intramedullary stem. The main goal of this study is to create mathematical models for stress load calculation of different external and internal fixing prosthesis parts and to compare stability of fixation for different types of bone forms.
Materials and methods. Using the finite elements method we have studied of mechanical properties of the "endoprosthesis – bone" system. We used a model of radius bone. For this research mathematical model of the system "endoprosthesis – raduis" we studied three types of radius bone with round, oval and triangle forms for bone. Also we studied biplate, triplate and cylindrical tube form of extracortical fixation of the endoprosthesis respectively. Study was performed with two types of loading: tension and bend. Strength of load was 100 N that corresponds to usually everyday loading of the forearm.
Results. Tension (stretch) loading. Maximal tensions were in the proximal part of the stem, on surfaces of the bone canal in places of contact with stem, on external surface of bone in places of contact with extracortical plates and in extracortical plates. Strength of loading was 1,5 MPa in the system with the round form of the bone and cylindrical extracortical tube of the endoprosthesis. Strength of loading was 1,3 MPa in the system with the oval form of the bone and biplate extracortical fixation. Strength of loading was 1,1 MPa in the system with the triangle form of the bone and triplate extracortical fixation. Bending loading. Maximal tensions were on external surface of bone in places of contact with extracortical plates and in extracortical plates. Tensions were less on upper and low surfaces of the stem and on surfaces of the bone canal in places of contact with stem. Maximal strength of loading was 42,0 MPa in external parts of the system with the round form of the bone and cylindrical extracortical tube of the endoprosthesis and 35,0 MPa in internal parts of the same system. Maximal strength of loading was 44,5 MPa in external parts of the system with the oval form of the bone and biplate extracortical fixation of the endoprosthesis and 32,0 MPa in internal parts of the same system. Maximal strength of loading was 38,0 MPa in external parts of the system with the triangle form of the bone and triplate extracortical fixation of the endoprosthesis and 30,0 MPa in internal parts of the same system.
Conclusion. Endoprostheses with combined type fixation have even load on all elements of connection. Endoprosthesis with triplate external fixation with bone of triangle form is most optimal system. Maximal tensions are in external parts of fixation devices of the same system. This system is most approximate to natural bone. These date and results are very useful for custom made and modular tumor prosthesis manufacturing.

Keywords : tumor endoprostheses, extracortical fixation
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EXTRASKELETAL EWING'S SARCOMA OF THE EXTREMITIES

Abstract ID : 1468
Submitted by : Murat Hiz the 2016-02-22 16:10:01
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION: Extraskeletal Ewing's sarcomas are very rare soft tissue tumours. Majority of them are located in trunkal locations and only 25% of these tumours are located in the extremities. The patient's chacteristics, treatment strategies and clinical outcomes of extraskeleteal Ewing's sarcomas located in the extremity would be presented in this study.

PATIENTS AND METHOD: 5 patients with extraskeletal Ewing's sarcomas were treated in our instution between 1995-2007. 2 females, 3 males with a mean age of 42,8 years. (31- 58 year-old). Patients presented mainly with pain and sudden onset of soft tissue mass proliferation. All patients had plain Xray and MRI, 2 patients had whole body bone scan. Radiological assessment revealed the location of the masses as follow: 3 in calf, 1 in thigh and 1 in gluteal region. All patients received semi invasive cutting needle biopsy and fine needle aspiration biopsy. Histopathologic examination revealed extraskeleteal Ewing's sarcoma- PNET. 2 patient's showed close proximity to the adjacent bones near cortex. These patients had cortical ondulation with no intra medullary involvement. Other patient's no masses showed relation with adjacent bones. Treatment method was preoperative chemotherapy(ChxT) in 3 patients. One of them received preoperative radiationtherapy(RxT). These patients received wide excision after induction ChxT. 2 patients with crural relatively smaller tumors received adjuvant ChxT after surgical wide exicision. These patients received 50 Gray adjuvant RxT postoperatively. Mean follow up time was 35 months(min 8 – max 108 months). One patients died due to ChxT toxicity 3 patients showed no evidence of disease 1 patient had systemic metastasis following local recurrence and alive with disease. 1 patient showed delayed wound healing due to preoperative RxT and treated by meticulous wound care. No infection was detected. Eventhough the cortex of adjacent bone showed no invasion and medullary involvement at preoperative MRI and bone scan, 2 patients with ondulations of the adjacent bone cortex received hemicortical resection in addition to wide excision of the soft tissue mass.

CONCLUSION: Extraskeletal Ewing's sarcoma showed similar survival and local tumor control results In this small series when compared with osseous Ewing's sarcoma of the extremity Preoperative RxT had potential risk of delayed wound healing. Resection of the adjacent bone cortex with irregularities increased the safety of surgical margin.

Keywords : ewing, extraskeletal, sarcoma,
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Factors affecting nonunion of intercalary allograft-host junctions: a novel classification system for allograft union prognosis

Abstract ID : 1409
Submitted by : Michaël Bus the 2016-02-21 15:13:07
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Nonunion of allograft-host junctions results from a complex interplay between biological and mechanical factors, which remain largely unclear. Aim of our study was to assess risk factors for the occurrence of nonunion, focusing on the influence of contact at the junction.

Patients and methods
We evaluated all patients who had an intercalary (whole-circumference) allograft reconstruction of the femur or tibia for a musculoskeletal tumor between 1989 and 2012, in two centers. Patients with <12 months of follow-up and grafts that were removed for other reasons in the first 12 months were excluded. To minimize bias, we only included one-plane transverse osteotomies with plate osteosynthesis.
The degree of contact at the osteotomy was assessed on anteroposterior (AP) and lateral radiographs of the first postoperative month. For our novel classification system, contact was classified into grades 1-3. Grade 1 was defined as full contact over the entire osteotomy in both directions; no radiolucent line was visible. Grade 2 was defined as partial contact and was further divided into grades 2A (≥50% contact) and 2B (<50% contact). Grade 3 was defined as a lack of cortical contact; a radiolucent line was visible over the entire length of the osteotomy. Two reviewers independently assessed all osteotomies. Nonunion was defined as the lack of consolidation in at least 2 of the 4 cortices (AP and lateral radiographs) at 12 months.

Results
We included 96 osteotomies (61 femoral [64%] and 35 tibial [37%]) from 57 patients (34 males, 60%) with a median age of 17 years (2-71). Median follow-up was 8.6 years (95%CI, 6.1-11.2). Predominant diagnoses were osteosarcoma (n=26, 46%), adamantinoma, and Ewing sarcoma (both; n=9, 16%). Fifty-six osteotomies (58%) were subjected to (neo)adjuvant chemotherapy, two (2%) to radiotherapy, and two (2%) to both. Osteosynthesis was performed with single (n=53, 55%) or double plating (n=39, 41%), or a plate combined with a nail (n=4, 4%). Sixty-five osteotomies (68%) were diaphyseal, 31 (32%%) were meta-epiphyseal.
Twenty-three osteotomies (24%) were classified as grade 1, 29 (30%) as grade 2a, 28 (29%) as grade 2b and 16 (17%) as grade 3. Kappa-coefficient for inter-rater reliability was 0.749 (‘substantial’). Nonunion occurred in none of the grade 1, 2/29 (7%) grade 2A, 5/28 (18%) grade 2B, and 8/16 (50%) grade 3 osteotomies (p=0.017). Nonunion risk was higher for diaphyseal (12/65, 19%) than for meta-epiphyseal junctions (3/31, 10%) (p=0.268). Nonunion risk was comparable between osteotomies that were subjected to chemotherapy (10/58, 17%) and those that were not (5/38, 13%) (p=0.590). Nonunion was less frequent in osteotomies in patients aged ≤16 years (3/41, 7%) than in older patients (12/55, 22%) (p=0.053).

Conclusions
Contact at the junction was the most important risk factor for nonunion. Patient age and osteotomy level also appeared to influence the risk of developing nonunion. The classification system demonstrated strong correlation with clinical outcome and a good inter-rater reliability. In order to reduce nonunion rates, care should be taken to obtain rigid fixation with firm contact at the junction.

Keywords : nonunion, intercalary allografts
Authors :
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First use of percutaneous cryotherapy ablation for pain treatment of vascular skin angiomatous lesion.

Abstract ID : 1369
Submitted by : hedi beji the 2016-02-17 19:40:51
Category : Targeted Therapy
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction :
Spindle cell Hemangioma was described in 1986 by Weiss and al. These lesions can be painful and cause a functional discomfort for patients. We report the first case of percutaneous cryotherapy for symptomatic spindle cell cutaneous hemangioma localized in the digital part of the hand.
Materials /Patients and methods :
A 17-years old girl with no medical history, was followed for a left nodulose palmar angiomatous since age of 10. Due to the increase in size, a surgical treatment was performed. Pathology confirmed the diagnosis of spindle cell hemangioma. Three months after surgery, patient consulted for new several lesions in the site of the previous surgery and was confirmed by MRI. Because of this evolution, anti-angiogenic therapy was performed. Due to the side effects, treatment had to be stopped early. During multidisciplinary meeting, a percutaneous cryotherapy was decided to treat pain symptoms.
Percuteaneous treatment consisted in the setting up of a cryotherapy needle (SEED ICE probe, GALIL MEDICAL based on Arden Hills, Minnesota) under ultrasound guidance in the center of the target lesion. Percutaneous carbodissection was performed around the target lesion in order to limit the risk of neurological and skin lesion (frostbite). Control cube size and correct position of the needle were made by realtime ultrasound monitoring.
Results :
No complication such as neurological, skin or bleeding lesion was reported.). The patient was seen at D15 and M1, M3, M6 post-procedure. No functional impairment, discomfort or pain on the left hand was detected. MRI control was performed one month later, and identified a lesion significantly decreasing from 8.5 cm3 to 2.4 cm3 (72%)
Conclusion :
We described the first use of percutaneous cryotherapy as an analgesic modality for a fusiform cells cutaneous hemangioma. This therapeutic modality appears to be an alternative treatment with no complication in case of pain symptoms.

Keywords : Cryotherapy, angioma, anti-angiogenic, analgesic, Interventional radiology
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French Bone Sarcoma Network (RESOS): 2015 annual report of multidisciplinary meeting activity in France.

Abstract ID : 1391
Submitted by : Francois Gouin the 2016-02-20 12:40:37
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

The National Cancer Institute (Inca) funded in 2013 some projects that promote the organization through expert centers for rare cancers in adults. RESOS network is in charge of bone sarcoma in that frame. One of the aims of the project was to identify Bone Sarcoma Centers to coordinate and register clinical activity and validate pathologic diagnostics through a bone tumor pathologist experts' network.
Material : We extracted from the data base all cases discussed during one of the multidisciplinary sarcoma meeting (MSM) of Resos Network In France in 2015. Pediatric cases were excluded.
Results : 1226 cases have been discussed in MSM in 2015. 692 of them (56%) were pre-diagnostic discussions for benign or non related diseases. 534 were sarcomas or GCT of bone. Finally 277 were incidental cases in 2015 (237 previous diagnostic and 20 non documented date of diagnosis). 129 were females (46%) and 14 males, mean-age of 48.6 yo [18-88]. The most frequent diagnosis was chondrosarcoma (40%), osteosarcoma (29%), GCT (14%) and Ewing sarcoma (9%). Only 9 centers register more than 10 cases discussed in 2015. 28 tumors have been treated without biopsy (11%): core needle biopsy was the preferred method of diagnostic (47%) and surgical biopsy carry out in 101 patients (39%). Most of surgical treatment was R0 resection (77.7%). R2 resection was reported in 4. 5%.
Discussion. According to the expected incidence of adults' bone sarcoma, 50 to 80 % of these tumors have been registered in Clinical MSM branch Resos in 2015. Morever, some other cases have been registered through the pathologist branch of Resos (not reported in this poster), and not registered through the clinical MSM branch. Another point is the links created with pediatric oncologic network, to collect information about sarcoma under the age of 18 yo. This extensive collection of data, and the use of a share tool (data base) might increase our knowledge of epidemiology of this rare condition in France, and knowledge of our practices in order to better organized and coordinate and offer to patient the most efficient health care.
Exhaustivity and control quality are our target for improve the quality of information extracted from our data base in 2016.

Keywords : Bone sarcome, Epidemiology, Network
Authors :
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Function of a reconstructed shoulder following tumour resection

Abstract ID : 1113
Submitted by : Thomas Schubert the 2016-02-01 22:10:29
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Primary bone tumors at the shoulder are rare entities. Their resection remains a surgical challenge regarding the anatomy. Many options do exist to reconstruct the shoulder. Osteoarticular allografts were used in the 1990' with mild functional results and high complication rates. Many authors recommend nowadays the use of a prosthesis coupled with an allograft if necessary. More recently, reverse shoulder arthroplasty was proposed to improve the functional outcome of the shoulder after limb sparing surgery.
Methods: Our goal was to compare two different types of shoulder reconstruction - osteoarticular allograft (OA) vs. allograft-prosthetic composite (APC) - in terms of survival, functional outcome and complications. Patients reconstructed with an OA included a complete rotator cuff suture. Patients who received an APC had a reverse shoulder arthroplasty with the humeral stem cemented through an allograft.
Results: We reviewed retrospectively 9 APC and 8 OA with a mean follow-up of 4.6 and 15.5 years, respectively. Of those, 8 APC and 5 OA were still alive and free of disease. Nearly all resections were Malawer type I except for two type V, one in the OA group and one in the APC group. Patients reconstructed with an APC demonstrated a significantly better function of the shoulder in terms of active forward flexion and MSTS score (74.8 ± 10.3 vs. 61.7 ± 6.6, for OA vs. APC, respectively, $p<0,05$). Deficit in external rotation was not different between groups. DASH score results were not significantly different but only 3 scores were available for analysis in the OA group.
Conclusions: Based on our experience, we recommend the use of a reverse shoulder arthroplasty with the support of an allograft if the bone resection exceeds the deltoid insertion.

Keywords : Shoulder, reverse prosthesis, allograft, reconstruction
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Functional and oncological outcome following resection of malignant bone tumors of the pelvis and hip transposition

Abstract ID : 1046
Submitted by : Jan Mettelsiefen the 2015-12-21 15:44:04
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
The treatment of primary malignant bone tumors of the pelvis remains a big challenge. Primary therapy goal is to achieve wide margins and a good long-term functional outcome. External hemipelvectomy is currently rarely required. High rates of complications after endoprosthetic replacement led to a preferential treatment with biological reconstructive procedures. The aim of this retrospective study was to evaluate the oncological and functional outcome of patients after a hip transposition.

Patients and Methods
Between July 2001 and December 2011 a biological reconstruction with a hip transposition (P2/3 resection n=9, P1-3 resection n=4) because of a primary malignant bone tumor (Ewing´s sarcoma n=6, osteosarcoma n=3, chondrosarcoma n=3 and MFH n=1) was performed in 13 patients (3 females and 10 males). Patients with Ewing´s sarcoma and osteosarcoma were treated in a multimodal therapy as determined by recommended protocols. The average tumor size was 104 mm, the mean operation time 235 minutes. The median follow up was 52 months. The analysis was performed using our database, the patient files and the informations of our continuous follow up. The Musculoskeletal Tumor Society (MSTS) scoring system for the lower limb was applied to evaluate the functional outcome.

Results
Three patients died of disease (osteosarcoma n=1, Ewing´s sarcoma n= 2). Ten patients are still alive, six of them with no evidence of disease (osteosarcoma n=1, chondrosarcoma n=1, Ewing´s sarcoma n=4), three patients live with a metastasized disease (chondrosarcoma n=2, MFH n=1). One patient, who had initially an osteosarcoma, developed a Ewing´s sarcoma of the lung and lives with metastasized disease. The mean overall survival time of the patients was 52 months (21-88 months). In twelve patients wide margins were achieved, one patient with a chondrosarcoma underwent an intra-lesional resection. This patient received an adjuvant radiotherapy and is actually free of progression and metastasis. Four patients experienced a local recurrence (chondrosarcoma n=1, osteosarcoma n=1, Ewing´s sarcoma n=2). The postoperative complications included one infected hematoma and one sexual dysfunction. The mean MSTS score was 60% (40-93,3%). Five patients could return to work after completion of therapy (osteosarcoma n=2, Ewing´s sarcoma n=3).

Conclusion
The oncological outcome is comparable to findings in the literature. Complication rates after biological reconstruction with hip transposition are significantly lower compared to replacement with megaprostheses of the pelvis or reimplantation of autoclaved resected bone. Primary instability and long-term rehabilitation finally lead to comparable functional results and in absence of tumor to a long-lasting reconstruction result. Therefore hip transposition should be taken into consideration especially in young patients.

Keywords :
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Gait analysis after tumor resection of the distal femur: Kinetic and kinematic study

Abstract ID : 1110
Submitted by : emilie peltier the 2016-02-01 18:22:20
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Gait function after massive resection around the knee for malignant bone tumor is of major concern in long term follow-up. The objective of this study was to analyze knee function during gait in patients who underwent reconstruction for malignant bone tumor of the distal femur. This evaluation has been performed in two groups of patients: massive knee prosthesis and biological reconstruction using a vascularized fibular auto graft.
Methods:
Sixteen patients managed for a malignant bone tumor of the distal femur were included in a prospective study. Six patients had a reconstruction using a hingeless knee endoprosthesis (group 1) and 9 patients with a biological reconstruction using a vascularized fibular autograft (group 2). Data from a gait analysis were collected at 1-year follow-up, focusing on knee sagittal analysis. Results were compared to a healthy control group.
Results:
In both group 1 and group 2, gait velocity was significantly reduced compared to control group (respectively 1.01 m/s and 1.03 m/s vs 1.19 m/s, $p<0.05$). Step width was also significantly reduced compared to control group (1.23m and 1.18m vs 1.35m, $p<0.05$)
All operated patients presented a “stiff knee gait” during mid-stance ($p<0.05$). However, this pattern was more important in the endoprosthesis group.
During loading response, knee flexion in both surgical groups was reduced compared to control group ($p<0.05$).
There was a genu recurvatum gait for all patients of group 1 during terminal stance and pre swing phase ($p<0.05$), conversely to patients of group 2.
With regards to sagitall knee analysis, there was a deficit of the intern moment of flexion and torque during mid stance. In group 1, the deficit was more important and was also present during pre swing. There was also a deficit of the intern moment of extension during terminal swing in group 1.
Conclusion:
“Stiff knee gait” is a pattern well known in operated patients after total knee replacement or in cerebral palsy patients. However these results of gait pattern after biological reconstruction of the distal femur using a vascularized fibular autograft were never reported. These two kinds of knee reconstruction allows an effective gait with compensatory mechanism, however, this loss of flexion leads to a weaker propulsion and damping. Patients with knee endoprosthesis use prosthesis mechanical specification and postoperative genu recurvatum is used to stabilize their limb during pre-swing.

Keywords : gait analysis, bone tumor, knee, pediatric, fibular vascularized auto graft
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Genetic phenotype in patients with osteosarcoma

Abstract ID : 1267
Submitted by : Otabek Abdurakhmonov the 2016-02-14 06:36:30
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim. Study the tumor‘s genetic phenotype influence on prognosis of osteosarcoma.
Material and methods. The study included 221 patients with osteogenic sarcoma. The number of men was 133, women - 88. The age of patients varied from 1 year to 35 years. The localization of tumor was follow: in 102 patients the tumor was in femoral bone, in 83 patients – in tibialis, in 16 patients – in fibula, in 11 patients in the beam bone, in 6 (2.7%) patients had in iliac bone and in 5-in humerus. In all cases, the treatment was performed according to the protocol and treatment‘s standard. We studied the genetic tumor markers (P53; Ki67; BcL2, chromosomal aberration) by the method of immunohistochemistry. The combination of these genes such as P53 + / Ri67 + / Bcl2- and chromosomal aberration more than 5%, considered as a negative combination and the combination of P53- / Ri67- / Bcl2 + and chromosomal aberration less than 5% as a positive. The survival rate of patients was studied by method of Kaplan-Meier, depending on the combination of genetic markers.
Results. The 3- and 5-years survival rates of patients with osteosarcoma who had positive combination of genetic markers (40.0% and 0%) were lower than patients who had negative P53-/ Ri67-/Bcl2+ and chromosomal aberrations <5% (± 90.0 2.9% and 40.0±4.2%) (P<0.05). The 3- and 5-years survival rate without metastasis in adverse combinations genes of P53+/Ri67+/ Bcl2+ and chromosomal aberrations was (>5%) - 70,0±3,4% and 10,0±3,2%, while in positive phenotype was - 90,0±3,4% and 50,0±4,3% (<0,05). In the analysis, the 3- and 5-years survival rate without recurrent in the negative phenotype composed - 60,0±4,9% and 10,0±,4%, whereas in a positive - 90,03±3,2% and 50,0±4,2% (p <0.05).
Conclusion.The study shown that, the prediction was unfavorable in the positive expression of P53+/Ki67+ and chromosomal aberrations more than 5%. The tactics in the treatment of osteosarcoma can be changed by combination of these markers.

Keywords :
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Supplementary material : http://sites.altilab.com/files/122/abstracts/emsos-jamila-2.docx, http://sites.altilab.com/
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Giant Cell Tumor of Bone – A single institution's 17 years' experience in its surgical treatment

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Submitted by : Santos Sandra the 2016-02-22 22:59:09
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Giant cell tumor (GCT) of bone is a common benign skeletal tumor, composed of mononuclear stromal cells and characteristic multinucleated giant cells that exhibit osteoclastic activity. It usually develops in long bones but can occur in unusual locations, and commonly extends near the articular surface. Though mostly benign, it is locally aggressive; as such, the mainstay of treatment has been surgery, with either local curettage (associated with adjuvant techniques) or wider resection of the lesion. However, curettage presents with a high recurrence rate, and resection of the tumor, due to its proximity to articular surfaces, leads to considerable morbidity, necessitating tumoral endoprosthesis for joint reconstruction.
Material and Methods: We restrospectively reviewed all patients with a radiological and histological diagnosis of GCT that were surgically treated in our institution, from 1996 to 2013. Clinical and demographical data, as well as recurrence rate and outcomes, were analyzed.
Results: A total of 68 patients were identified (44 females); Median age at diagnosis was 37,5 years (15-74). Pain was the primary symptom in the majority of patients, with 13% presenting with a pathological fracture; median duration of symptoms before consultation was 24 weeks. Most frequent tumor locations were femur and tibia (21 and 26 patients, respectively), followed by radius and humerus; less common locations included pelvis, hand, feet, fibula and patella. 19% of cases were recurrences referenced to our institution. The majority of patients had either en bloc (36%) or intramarginal (54%) resections; adjuvant therapy with phenol was used in 17% of cases. Recurrence rate in primary tumors was 7% (four cases); all had performed intramarginal resection, and three had atypical tumor locations (acetabulum, greater trochanter and toe phalanx); recurrence presented 335 days (mean) after surgery. The most common complications at 2-years follow-up were pain (29%, ranging from residual to significant), functional limitation (17%) and infection (10%); 28% of patients had no complications or symptoms at 2-years follow-up. All cases of infection occurred in patients who had en bloc resection with endoprosthesis reconstruction.
Discussion and Conclusions: Surgery remains the first line of treatment in GCT of bone. However, we must consider the potential for significant morbidity when choosing the optimal procedure for each case. Intramarginal resections have good results, particularly when associated with adjuvant therapies (such as phenol and cement); however, they are associated with a higher recurrence rate. On the other hand, en bloc resections have low recurrence rates, but higher risk for potentially catastrophical complications, such as infection. Though pain and functional limitations are common complications for both procedures, they are usually mild and well tolerated. A timely diagnosis and prompt intervention are fundamental in allowing the choice of less morbid procedures, reserving wider resections and prosthesis reconstruction or arthrodesis for cases of extreme bone loss and local soft tissue extension.

Keywords : Giant Cell Tumor, Treatment, Surgery
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Hip arthroplasty after pathological fracture of the proximal femur for patients with multiple metastatic lesions.

Abstract ID : 1370
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Category : Others
Typology : Poster
Status : Validated
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Metastatic lesions of the proximal femur are on second place among all the rest anatomical locations. Ablative surgery for primary tumors of the proximal femur has a special place in oncology and orthopedics. Currently, surgery is the leading method of treatment, aimed at preserving not only the life of the patient, but also the recovery of limb function, which plays an important role in their early rehabilitation and subsequent treatment the primary cancer. This method allows us to extend and improve the quality of life while maintaining a satisfactory limb function.
The purpose of the study was to evaluate the short and medium-term results of treatment of patients with metastatic lesions of the proximal femur, by means of standard and revision endoprostheses of the hip joint, using an complex surgical technique developed in our clinic.
Between 2007 and 2014, 126 patients with multiple metastatic lesions with pathological fracture of the proximal femur underwent primary limb preservation with use of revision and standard implants in the primary total and bipolar hip arthroplasty. The patients' age ranged from 36 to 75 years (with the mean of - 55 ± 1, 5). Distribution by nosology is the following: breast cancer 69 (54,7%), kidneys cancer 32 (25,4%), lung cancer 12 (9,5%), prostate cancer 8 (6,3%), colon cancer 5 (3,9%). The size of the defect of the proximal femur after removal of the tumor varied from 4 to18 cm, what affected the choice of type of the stem. When surgical technique was close to en bloc resection and the length of defect was 5 cm and more, we used revision stems. Clinical and radiographic outcome of treatment was assessed by the MSTS system and Harris Hip Score.
Clinical evaluation was performed at 12 months after primary surgery in 93 patients. We received the following functional outcomes: for standard implants average MSTS score was 89% Harris Hip Score 82, for revision endoprostheses MSTS score was 78% Harris Hip Score 76.
The failure of joint replacement associated with the balance of soft tissues is the most common cause of endoprosthesis loosening for this anatomical location of the tumor. We applied the revision implant systems of hip in cases of tumors of the proximal femur, and the analysis of medium-term results showed mostly excellent and good results in 95,5% of all observations. Therefore we consider these implants give good functional outcome and early activation of the patients without compromising the oncological treatment component.

Keywords : Hip arthroplasty, metastatic lesions
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How to manage massive long bones oncologic defects in growing children? The experience of an Italian reference centre

Abstract ID : 1149
Submitted by : Michele Boffano the 2016-02-07 02:38:47
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction The reconstruction of long bones oncologic defects in growing children presents many options and the chosen solution is often patient (or surgeon) based. Amputation, rotationplasty, modular prosthesis, custom-made implants, growing implants, allograft, and other biological techniques have been described for the management of these cases. The aim of the study is to confirm the reliability of an existing protocol for the reconstructive management of pediatric bone sarcomas with a case series from an Italian reference centre.
Methods In an Italian reference centre, following the experience of Rizzoli Institute, we analyzed the different surgical treatments for pediatric bone sarcomas according to age, growth target, expected final limb length. Complication rate and oncologic follow up were evaluated.
Results We treated 60 children below 16 years old with bone sarcomas (39 osteosarcomas, 21 Ewing's sarcomas). Age range 4-16. 35 cases were around the hip and the knee. In children older than 12 years old and with an expected lower limb discrepancy of 5 cm we chose an adult megaprostheses oversized; in the range 6-12 years old with an expected limb discrepancy of 5-10 cm we chose an allograft prosthetic composite, a growing modular prostheses, or a custom-made prosthesis; in children younger than 6 years old with an expected limb discrepancy longer than 10 cm we chose between amputation and the combination of allograft and prostheses used as a spacer till the possibility to implant a growing or an adult megaprostheses. Five children had a primary amputation (two hip disarticulation, 1 above knee amputation, and 2 below knee amputation). Oncologic follow up has been regularly conducted (range 2-10 years). Eleven patients died of disease (lung metastases), two of them after local recurrences requiring a hip disarticulation. Six patients are alive with stable lung disease. The remaining 43 children do not present evidence of disease at the last clinical examination. We observed 2 delayed union at the junction allograft-host bone and 6 segmental deformities needing further surgical procedures (external fixator and/or bone graft), and 2 fractures of the allograft (1 treated incruently). 4 limb length discrepancy with secondary scoliosis were also observed. No prosthesis-related complications occurred.
Conclusions: Applying this protocol we observed a low mechanical-implant related complication rate. Comparing our results to Literature data of other techniques (induced membrane technique, distraction epiphysiolisis, invasive growing prostheses) we observed a lower reintervention rate. It is not possible to evaluate the infection rate among the different techniques used because of the low number of cases in each subgroup. Local recurrence and survival according to necrosis, surgical margins, and adjuvant treatments are comparable to other published studies. Further studies with longer follow up are mandatory to obtain an international consensus on reconstructive techniques in children with bone sarcomas in the lower limb and to prevent non-site related complications. The choice between an amputation or a reconstructive technique (and which) should be thoroughly discussed with the parents and eventually with the little patient.

Keywords : pediatric sarcomas, growing children, limb length discrepancy, allograft, reconstruction
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Impact of fluid collection on radiotherapy outcomes in soft tissue sarcoma

Abstract ID : 1398
Submitted by : Il Han Kim the 2016-02-21 03:28:16
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

Purpose/Objective
Fluid collection of lymph or blood may accumulate at the site of excision after surgery for soft tissue sarcoma, with reported incidence rates from 10-36%. Though small fluid collections have a high probability of being completely covered within the postoperative radiotherapy (PORT) field, large fluid collections may require a more extensive expansion of CTVs. This study is an unprecedented analysis of fluid collection in relation to radiotherapy outcomes after wide excision of soft tissue sarcoma (STS).

Material/Methods
Medical records of 151 patients with STS treated with wide excision followed by adjuvant PORT between 2004 and 2014 were retrospectively reviewed. Only non-recurrent and non-metastatic patients were included. After evaluation of CT and MR images taken at the time of PORT planning, fluid collection was detected in 46 patients (30.5%). Because fluid collection developed more commonly in lower extremity ($p<0.001$) and higher grade tumors ($p=0.095$), only these patients were included in further analyses (n=76). Fluid collection was present in 35 (46.1%) patients, of which 74.3% and 25.7% had, respectively, either complete or partial coverage in planning target volumes (PTVs) throughout the entire course of PORT.

Results
After a median follow-up of 41 months, patients with and without fluid collection demonstrated local failure rates of 14.3% and 9.8%, and 5-year local control (LC) rates of 83.1% and 86.8%, respectively. The presence of fluid collection had no statistical impact on the clinical outcomes of PORT. Partial coverage of fluid collection showed a low 5-year LC rate of 77.8% compared with 85.5% and 86.8% for patients that had complete PTV coverage or absence of fluid collection, respectively, without statistical significance. Post-PORT complications developed in 5 (6.6%) patients, of which 4 had fluid collection. Wound complication developed in 3 (8.6%) of 35 patients with fluid collection and in 1 (2.4%) of 41 patients without fluid collection.

Conclusion
Fluid collection demonstrated lower LC rates after wide excision and PORT for STS, but with a reasonable wound complication rate of 8.6% when compared with rates of previous studies ranging from 5-17%. Furthermore, partial coverage of fluid collections in PTVs had worse LC rates, thus recommending complete coverage. Future evaluation with a larger number of cases will be needed for statistical support of our findings.

Keywords : soft tissue sarcoma, radiotherapy, fluid collection, seroma
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Impact of Hypoxia on Response of Chondrosarcomas to Cisplatin

Abstract ID : 1081
Submitted by : Eva Lhuissier the 2016-01-22 11:22:47
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and objectives:
Chondrosarcoma (CHS) is a rare bone tumor characterized by the presence of a cartilaginous matrix. Its treatment has undergone only few improvements over the past 30 years because of its resistance to chemotherapy and radiotherapy. Several hypothesis have been advanced to explain the resistance of chondrosarcomas to conventional treatments, including the role of hypoxia. However, few studies have been conducted in chondrosarcomas on the role of hypoxia in resistance to conventional treatments. In this study, we focused on the response of chondrosarcomas to cisplatin under hypoxic conditions.

Methods:
Four cell lines derived from human chondrosarcomas have been used. HIF-1 and HIF-2 expression was evaluated by Western-Blotting. Survival curves were established after cisplatin treatments under normoxia (21% O2) and hypoxia (1% O2). Cell cycle was determined by flow cytometry and apoptosis was estimated through PARP cleavage by Western-Blotting. STAT3 phosphorylation was also evaluated by Western-Blotting. Finally, intracellular concentration of platinum was measured by mass absorption spectrophotometry.

Results:
Hypoxia stabilized HIF-1 and HIF-2 proteins and increased cell growth in the four chondrosarcoma lines. However, hypoxia increased resistance to cisplatin in some CHS lines, whereas it had no effect in other lines. The resistance to cisplatin upon hypoxia was associated to a reduction of apoptosis as shown by the decrease of cell percentage in sub-G1 and PARP cleavage. Therefore, to understand the mechanism responsible for the heterogeneity of CHS response to cisplatin upon hypoxia, we investigated the intracellular concentration of platinum, but we did not observe significant differences between chondrosarcoma lines upon normoxia and hypoxia. We also analyzed the phosphorylation of STAT3, a transcription factor known to be usually induced by hypoxia and favoured tumoral cell survival. However, we found that its phosphorylation was lower in cells responding to hypoxia.

Discussion / Conclusion:
In conclusion, under hypoxia, the response to cisplatin is variable and depends on CHS lines. To further investigate this response, transcriptomic analysis is in progress to identify genes differentially regulated by hypoxia after cisplatin treatment in the different CHS lines. Also, data of whole exome sequencing are currently analyzed to identify putative genetic variations potentially involved in cisplatin treatment upon hypoxia.

Keywords : chondrosarcoma, hypoxia, cisplatin, resistance
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Impact of single center surgery and a network of associated oncological institutions on Ewing sarcoma survival rates

Abstract ID : 1308
Submitted by : Andreas Krieg the 2016-02-14 22:30:51
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Survival after Ewing Sarcoma diagnosis increased during the past decade due to new available systemic chemotherapy analyzed in multi-center studies. The purpose of the present study is twofold: (a) to assess survival rates and identify prognostic factors for patients with bone sarcoma which were treated in a single center by only one experienced surgeon; and (b) to compare obtained data with results of multicenter studies.

Methods: All tumors (n = 38) were resected or observed by the same surgeon whereas surgery was combined with radiotherapy in 55.3% of the patients (n=21). Sarcoma bone tumors were located at the trunk (n = 20, 53%) and extremities (n=18, 47%). Median age at diagnosis was 17.5 years (4.7 – 60) and the median follow-up time for all patients was 8.2 years (9.8 years for survivors, 3.2 years for non-survivors).

Results: The overall survival (OS) rate of the present study group is 76,3% whereas the survival for metastasis free sarcoma decreases from 90,5% (Literature 60%) to 50% (Literature <40%) for disseminated disease. Patients who had a good response to chemotherapy survived in 83,3% of the cases. Interestingly, tumor volumes >200ml are associated with a higher OS (97.7%) when compared to volume <200ml (72.9% and a higher OS was found for patients younger than 15yrs (82,4%) when compared to older patients (73,3% for >15yrs). Noteworthy, a higher OS was calculated for trunk localized ES (85.5%) when compared to extremities localized ES (68,8%)

Conclusion: The survival rate in the present single center study was superior to those reported in multi-center studies although same chemotherapy protocols were used and no substantially difference are apparent for patient population. Our results clearly show that the experience of the surgeon and the association to onocological institution have a great impact on the survival rates. Based on the present data we re-emphasize that patients with ES are best treated in a large and qualified center by an experienced surgeon who is in close collaboration with oncological institutions.

Keywords : Ewing sarcoma, survival, prognosis, single center, network
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Incidental diagnosis of familial osteopoikilosis in a patient firstly complaining of ankle pain

Abstract ID : 1211
Submitted by : Sergio Figueiredo the 2016-02-11 17:58:14
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: Familial osteopoikilosis is a rare, autosomal dominant, benign sclerosing bone dysplasia. Its diagnosis is mostly done when an X-ray is requested for any other reason. In plain films, small round shaped bone cysts can be found around major joints, with predilection for long tubular bones. Our aim is to describe the diagnosis process of an atypical presentation of familial osteopoikilosis through an observed clinical case.
Methods: A single case report.
Results: We hereby report the case of a 32 year-old woman, complaining of left non-traumatic ankle pain. Foot and ankle X-rays revealed anterosuperior calcaneotalonavicular fusion, but also several hyperlucent cystic lesions around the articular surface of both ankle and foot bones. In fear of a malignant disease, the patient was further studied through aditional films and an ankle magnetic resonance imaging scan. All of them revealed the same lesions all around wrists, hands, hips, knees, ankles and feet. The same were then found in both siblings but not in her parents, none of which presented any kind of signs or complaints. Genetic testing revealed a mutation in the LEMD3 gene, thus confirming the diagnosis.
Discussion/Conclusion: Diagnosis confirmation of osteopoikilosis is mandatory, as malignant threats may appear similar on imaging studies. Inspite of the great aid provided by genetic testing, sibling resemblance and knowing disease penetrance as not being complete would allow us to safely keep disease vigilance without major fears of severe prognosis.

Keywords : Familial Osteopoikilosis, Buschke-Ollendorff syndrome, LEMD3 gene mutation, Myelopathy, Benign Dysplasia
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Internal hemipelvectomy - possibility of reconstruction in children and youth with primary malignant bone tumors.

Abstract ID : 1068
Submitted by : Andrzej Szafranski the 2016-01-12 23:54:38
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

In the period 1994 to 2013 in our Clinic 58 patients have been operated with primary malignant bone tumors in pelvis localization; 35 boys and 22 girls, in age from 5 to 18 years, average 13 years. Operations have been made in second step, after neoadjuvant chemotherapy. In histopathologic diagnosis were sarcoma Ewingi in 30 pts., osteosarcoma in 20 pts., chondrosarcoma in 8 pats. Localization by Enneking classification; stage I were in 14pts, stage II in 40 and stage III in 11 pts. Total hemipelvectomy have been made in 4 pts and internal hemipelvectomy in 54 pts In reconstruction were used different systems; bone grafts, AO plates, endoprostheses (21 pts) and trevira tube.
Results. Alive 39/58 pts, follow up 2-23 yrs, mean 6,2 yrs. Early and late complication were observed in 24 cases. Satisfactory functional results in 65 %
Conclusion; Possibility of internal hemipelvectomy depends on; 1) localization and extent of the tumor; 2) tumor reaction after neo-adjuvant chemotherapy 3) patients age. Internal hemipelvectomy as limb salvage surgery is satisfactory, but sufficient results of surgery depend on extent of operation and rehabilitation. Operators' experience is of basic importance for surgery

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Keywords : pelvis, malignant bone tumors, treatment, surgery
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Internal hemipelvectomy & massive allograft reconstruction: long term follow-up.

Abstract ID : 1336
Submitted by : Israel Pérez-Muñoz the 2016-02-15 23:43:02
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. Allograft reconstruction after internal hemipelvectomy because of musculoskeletal tumour has been our preferred reconstructive method during the last 30 years. The aim is to show its long term follow-up.
Materials and method. We have retrieved from our database the casuistic regarding pelvic musculoesketal tumours. We focus on massive allograft reconstruction to overcome the defect after resection. Thus we analyze: tumor histology, pelvic extension, margins (according to Enneking and AJCC/UICC “R” classification), allograft behaviour (radiographic consolidation and revision surgery), and functional results (MSTS and SF-12 scores) on the long term follow follow-up.
Results. Between 1978 and 2015 we have performed 101 surgeries in the pelvic region: 23 benign aggressive tumors, 59 bone sarcomas and 24 soft tissue sarcomas. Since 1985 we have performed 42 allograft reconstruction after internal hemipelvectomy. The median follow up was 66 months, ranging from 4 to 360 months. The median consolidation time was 8 months. The overall revision rate was 73,8%, but just 14,3% (6 out of 42) of pelvic allografts had to be removed because of complications.
Conclusions. Several reconstructive methods have been described after pelvic resections. The massive allograft technique is an adequate technique to vanquish the result of an internal hemipelvectomy.

Keywords : Internal hemipelvectomy, allograft reconstruction
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Internal hemipelvectomy without reconstruction in aggressive chondroblastoma left pelvis - a case report

Abstract ID : 1342
Submitted by : Esdras Furtado the 2016-02-16 01:46:37
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUTION: Internal hemipelvectomy surgery is a technique that consists of removing the total or partial of the hemipelvis, keeping the neurovascular structures and maintaining the femoral head and the entire lower limb, and may or may not keep the acetabulum. Postoperative satisfactory and walking with early part load and full load from 11 months after surgery, helping the patient to remain with the leg and to have quality of life for scoring walk. The main indication is the presence of tumor that affects bone of the pelvis and requires extensive resection, as in the case of chondroblastoma in the pelvis, which can be with or without reconstruction. Chondroblastoma is a rare cartilaginous tumor that affects young patients 5-25 years of age in 90% of cases, and the most common location is the epiphysis of long bones, especially in the leg around the knee, but can also affect bones plans. The clinical picture is nonspecific, with pain, swelling and joint effusion. In radiography it is observed extent of injury to metaphysis, with remodeling of cortical, periosteum reaction and endosteum irregularities, well-defined margin. Magnetic resonance imaging shows tumor localization, extension to metaphysis and adjacent soft tissues. Diagnosis is by surgical biopsy and treatment can be from curettage graft surgery even more aggressive depending on the involved region, as internal hemipelvectomy with or without reconstruction. To report the case of internal hemipelvectomy (type 2, where it dries the acetabulun) without reconstruction in chondroblastoma left pelvis, emphasizing the importance of technique for the preservation of lower limb and quality of life by allowing early ambulation.
MATERIALS / PATIENT AND METHODS: Data collected in medical records and interviews with patient and bibliographic search in the databases PUBMED and SCIELO. Patient S.E.C., 35 years old, male, coming from João Pessoa - PB, sought treatment complaining of mild and intermittent pain in the left hip 10 years ago after blunt trauma. AP radiograph of the pelvis and Magnetic Ressonance hip observing lytic lesion of left iliac bone with invasion to the left and soft tissue acetabulum. It was initially indicated posterior percutaneous biopsy of the lesion and the use of orthotics, with results Aggressive Chondroblastoma. Due to the laughter of recurrence and extent of injury, patient was asked about surgical technique internal hemipelvectomy (type 2), left without reconstruction. Postoperative unloaded in the first 2 months, sitting and partial load from the 2nd month and total load from the 11th month, with compensatory jump of 3 cm.
RESULTS: Surgical results of surgical technique of internal hemipelvectomy type 2 are excellent, leading patients to have independent life and no need to use protesis, and walk without help.
CONCLUSION: Internal hemipelvectomy without reconstruction is indicated for cases of aggressive chondroblastoma pelvis and has satisfactory result for contributing to the quality of life of patients with lower limb preservation and maintenance of the ability to walk.

Keywords : Internal hemipelvectomy, hemipelvectomy, chondroblastoma
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Intraoperative RadioTherapy (IORT) electron boost followed by External Beam Radiotherapy (EBRT) in limb-sparing treatment of primitive and recurrent sarcomas of the extremities and girdle joints

Abstract ID : 1235
Submitted by : Carmine Zoccali the 2016-02-12 16:55:31
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Adjuvant radiotherapy is indicated in any resected sarcoma with positive or close margins of < 10mm, intermediate-high grade, recurrent, and size > 5cm. The rationale for the introduction of Intra-Operative RadioTherapy (IORT) in the adjuvant regimen has the following theoretical advantages: reduction of the total time of radiation therapy and of the administered dose with External Beam Radiotherapy (EBRT) to healthy tissues; the possibility to apply a single high dose with enhanced biological effectiveness resulting in sterilization of microscopic disease of the tumor bed; the direct assessment of the tumor bed and organs at risk, which may limit the volume of treatment and should lead less fibrosis and improved sparing of joints with, finally, a better functional outcome. Here we report our preliminary experience with IORT+ EBRT in patients with localized soft tissue sarcoma of the extremities at high risk for local recurrence after limb-sparing surgery.
Materials /Patients and methods
All patients treated with such approach since 2009 were retrospectively identified. The inclusion criteria were primary or recurrent localized soft tissue sarcoma of the extremities close to joint without evidence of distant disease for whom close or positive margins at surgery were anticipated. IORT was performed by a dedicated accelerator, Novac7, delivering 7-9 MeV electrons beams. A single dose of 10-16 Gy was delivered intraoperatively during limb-preserving surgery, followed by EBRT to 45-50.4 Gy in 25-28 fractions. Side effects were scored according to the Common Terminology Criteria for Adverse Events v4.0 (CTCAE). Overall survival (OS) and disease-free survival (DFS) were estimated using the Kaplan-Meier method. Median follow-up is 49 months (range 11-83 mths).
Results
Fourteen patients were analyzed. Median age was 60 years (range: 19-87). Five patients had recurrent tumours and nine primitive sarcomas, of which 2 at stage IIA , 5 at stage IIB and 2 at stage III. The tumor site was: shoulder, 1 patient; arm, 2 patients; forearm, 3 patients; thigh, 4 patients; knee, 3 patients; leg and foot, 1 patient. The histological type was: mixofibrosarcoma high grade, 4 patients; pleomorphic sarcoma, 4 patients; synovial sarcoma, 3 patients; leiomyosarcoma, 2 patients; myxoid and pleomorphic liposarcoma, 1 patient, respectively. All the patients underwent a limb-sparing surgical excision and received a IORT single dose of 10 Gy, 12 Gy, and 16 Gy in ten, three and one cases, respectively. All patients underwent postoperative EBRT. Four patients received also adjuvant chemotherapy. Local control (LC) was obtained in all patients (100%) and no grade 3-4 toxicities were observed. At 4 years, OS is 100% and DFS is 72.5% .
Conclusion
In selected patients with marginally resectable primary or recurrent sarcomas undergoing limb-preserving surgery, IORT followed by EBRT is a feasible approach with excellent preliminary results.

Keywords : Intraoperative radiation therapy, IORT, Adjuvant radiotherapy, sarcoma, limb-sparing surgery
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Is it ever justified to insert a non-invasive extendible prosthesis at the time of revision surgery?

Abstract ID : 1144
Submitted by : Magdalena Gilg the 2016-02-06 20:51:38
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

Background Non-invasive growing endoprostheses have been used successfully in children following resection of primary bone tumours. This technology has also been used in highly selected cases to correct limb-length deficiency in patients requiring revision surgery for loose prosthesis or infection. We set out to establish if this expensive technological advance could be used successfully in these cases and if so whether there were any factors predictive of success or complications.
Methods All patients who had a non-invasive growing endoprosthesis inserted at the time of a revision procedure prior to 2014 were identified from our database. The indications and outcomes were evaluated.
Results 21 patients (14 male, 7 female) underwent a revision procedure where a non-invasive growing endoprosthesis was inserted. Their ages ranged from 10 to 41 years. Mean amount of shortening at the time of revision surgery was 48 mm (range 10-100). 12 were done following aseptic failure of a previous prosthesis while 9 patients had a non-invasive growing EPR inserted at the time of a second stage revision for deep peri-prosthetic infection. Lengthening was performed in all but 1 patient (mean lengthening 51 mm, range 5-140) with mean residual leg length discrepancy at final follow-up of 13 mm (range 0-35). Two patients developed deep peri-prosthetic infection, one successfully treated with further revision surgery while the other required an amputation. Kaplan-Meier estimation showed a median revision-free survival of 58 months. At two years, revision- free survival was estimated 76% and decreased to 49 % at five years. Event-free) survival was 63 % at two years and 43 % at five years. Mean MSTS score was 25 (range 19-30).
Conclusions: In this series, a revision non-invasive growing replacement has been successful in 20 out of 21 cases at a mean follow-up of 67 months (range 7-128). Only one patient required amputation for persisting infection. This technique is a reasonable option in patients with significant limb-length discrepancy requiring a revision endoprosthesis.

Keywords :
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Knee joint capsule reconstruction after soft tissue tumor resection

Abstract ID : 1141
Submitted by : Lauris Repsa the 2016-02-06 18:01:21
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction.
Soft tissue tumors in poplitel fossa is challenging to treat due to anatical considerations- it is close to tibial posterior nerve and popliteal blood vessels. To achieve safe margins and preserve functional lower leg, resections should be wide and sometimes important structures should be resected. In Hospital of Traumathology and Orthopaedics in Riga, Latvia during year 2015. for 2 patients were performed soft tissue resection im popliteal fossa and joint capsule reconstruction using mesh synthetic graft.
Materials and methods.
It is case report of 2 consecutive occasions, where similar treatment was applied.
Amount of cases is too small, to make statystical analysis.
Results.
In year 2015 in Hospital of Traumathology and Orthopaedics in Riga was treated 2 patients both suffering with histologically approved synovial sarcoma of popliteal fossa. For 1 patient it was left leg, for other- left leg. In Bouth cases prior was performed incisional biopsy, which confirmed synovial sarcoma. In general anesthesia facing down under toutniquet was performed wide radical resection including underlying joint capsule leaving major blood wessels and nerves intact. Resected capsula was reconstructed with mesh synthetic abdominal graft due to potential joint instability, meniscus refixated to graft.
After surgery wounds healed primary, after 6 months are no signs of recurrance, joints are stable, one patients claims about little discomfort in popliteal regions due to abrasive feelings.
Conclusion.
Popliteal fossa tumors are hard to treat surgically due to close vital structures, in great amount of cases blood vessel grafting or eaven amputation is necessary. In selected cases, when vital structure preserving is possible, after wide resection reconstruction of structures is needed to prevent further complications. Using mesh graft for knee-joint capsule reconstruction is method of choice after wide resections.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/dsc00894.jpg, http://sites.altilab.com/files/122/abstracts/dsc01142.jpg
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Large Gout Tophus of Thumb Mimicking Giant Cell Tumor of the Tendon Sheath

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Submitted by : Engin Ilker Cicek the 2016-02-22 20:25:25
Category : Others
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Introduction:
Gout is a chronic inflammatory disease characterized with recurrent onsets of inflammatory attacks and elevated serum uric acid levels. Inflammation generally causes painful, warm, red, and swollen joints, especially at the first metatarsophalangeal joint. Untreated cases lead to destruction of the joint surfaces and formation of tophi. Gout tophi can mimic soft tissue and bone neoplasms. Also can it could coexist with malignant tumors.
Case:
50-year-old male patient presented with a large mass at his thumb. Range of the motion was limited at the interphalengeal joint. He had no pain, local warmth and redness. The mass had slowly enlarged within several months. He denied any other symptoms. Serum uric acid level was normal. Plain radiography revealed an radio-opaque, cloud-shaped lesion surrounding the interphalengeal joint. The initial clinical and radiological findings lead us to the giant cell tumor of tendon sheath. We performed fine needle biopsy. The pathologic diagnosis revealed gout tophus,surprisingly. Debulking surgery was performed. No complications were seen postoperatively and patient regained full range of motion at postoperative first month. He was also satisfied with the improved cosmesis.
Discussion:
Conventional treatment for the gout consists of treating the acute flare, preventing the flares with proper medication and dietary precautions, lowering excess stores of urate to prevent the flares and tissue deposition of urate crystals. Large tophi are often resistant to medication. Surgical debulking is generally preferred when the tophi causes joint limitation, skin breakdown with risk of infection and compression of neurovascular structures. Our patient had no history of inflammatory flares, renal stones or other classical gout findings, as well as the laboratory findings. In other words, this was a true case of gouty tophus mimicking a soft-tissue neoplasm.
Conclucion:
Fine needle aspiration biopsy is rarely performed for tophi because of the typical presentation and well known clinical findings. Along with the compression related symptoms such as joint limitation and neurovascular comprimise, benign and malignant lesions may coexist with gout tophi, such as malignant fibrous histiocytoma and fibrosarcoma. We encourage to perform fine needle aspiration biopsy for differential diagnosis. In our case, debulking surgery significantly improved joint function and cosmetic appearance.

Keywords : gout, tophus, FNAB, tendon
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Limb amputation as a result of Tenosynovial Giant Cell Tumour

Abstract ID : 1469
Submitted by : Michiel van de Sande the 2016-02-22 16:32:29
Category : Others
Typology : Poster
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Introduction
In Tenosynovial Giant Cell Tumour(TGCT), previously named Pigmented Villonodular Synovitis(PVNS), a distinction is made between single nodule(nodular-type) and multiple nodules(diffuse-type). It is considered a benign neoplasm; however the diffuse-type might grow locally invasive. Onset and extermination of this orphan disease are unknown. Surgical resection is the most commonly performed treatment. Unfortunately, recurrences often occur(0-92%), necessitating reoperations and other adjuvant treatments. Once all treatments fail or severe complications occur; limb-amputation may become unavoidable. We describe three cases of amputation for this benign disease.

Patients
A female patient aged 69 with an extensive history of surgical exploration of her right knee, radiation, intra-articular Yttrium, two arthroscopic synovectomies for diffuse-TGCT and a total-knee-replacement(TKR), was admitted to our tertiary center with a swollen knee, pain, fever and elevated infection parameters. PET-CT showed enhancement around her TKR, suspect for recurrence TGCT. Imatinib-therapy did not show any effect. After several blood-transfusions and antibiotics she was discharged. Within one year she was re-admitted with progressive infectious appearance, persistent pain, knee swelling and TGCT growing outside the operation-scar. Beside several blood-transfusions and intravenous-antibiotics, an investigational tyrosine-kinase-inhibitor(TKI) was started. After a fall, her condition worsened and she became septic: an above-knee-amputation was performed. At one year follow-up there were no signs of local recurrence or infection.

A 63-year-old-male patient with a long history of diffuse-TGCT in his left knee previously treated with an arthroscopic synovectomy, underwent a two-staged front-and-back synovectomy; showing an extensive extra-articular growth pattern, taking a future-TKR into account; radiotherapy was not initiated. Because of TGCT extensiveness, rapid symptomatic recurrences and osteoarthritis; he underwent a distal femoral resection and reconstruction with an endoprosthetic-reconstruction(EPR). After a low grade secondary infection; 9 open procedures followed within three years; including removal and re-implantation of the EPR. Unfortunately the low grade infection recurred and the patient finally preferred an amputation over life-long antibiotics or a third revision. At present he is pain-free and ambulatory with one crutch.

A male 67-year-old-patient underwent an elective right upper-leg-amputation four years after histologically proven diffuse-TGCT. After years of indistinct progressive knee-pain; a TKR was performed. Perioperative TGCT(t(1;6)(p13;q27)) was diagnosed as a coincidence finding. A few months later a supra-patellar biopsy showed a mixed malignant appearance. He developed lymphadenopathy in his groin, on which he received radiotherapy, as well as on his knee. One year thereafter, several metastases were discovered; treated conservatively. When he developed pulmonary symptoms; an investigational TKI was started, which had an effect on his lung-metastases, but not on his irradiated painful lymphademic leg. As a last resort, the primary-tumour was successfully resected by amputation.

Conclusion
Current literature lacks reports of limb-amputation for TGCT. To point out potentially aggressiveness of TGCT, a benign disease, three disastrous patient history scenarios are described. Further investigation of risk factors for recurrence TGCT is essential for proper primary-treatment planning, in order to prevent extensive final option treatments like amputation. In order to get reliable information about this orphan disease and to improve our knowledge of disease impact; we started a multidisciplinary, international, multicenter collaboration.

Keywords : Tenosynovial Giant Cell Tumour (TGCT), Pigmented Villonodular Synovitis (PVNS), amputation
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Limb salvage in soft tissue sarcomas of upper limb: long term results

Abstract ID : 1252
Submitted by : ANTONIO D'ARIENZO the 2016-02-13 19:27:01
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Soft Tissue Sarcomas (STSs) of upper limb represent a worrisome disease for both patients and surgeons. Indeed, due to the malignancy and characteristics of the anatomical site, a high rate of amputation should be expected. We aimed to review the long term results of STSs of the upper limb excised at our Institution (1).
Materials & Methods: From January 1989 to December 2015 a total of 1318 STSs have been treated; of them, 322 (24%) were located in the upper limb, thus being included in this retrospective study.
Patients averaged 53 years (1-90) at surgery, with a male/female ratio of 1.4. Low grade sarcoma (Broders 1-2, FNLCC 1) were 88 (27%), high grade sarcoma (Broders 3-4, FNLCC 2-3) were 234 (73%). The shoulder girdle was involved in 83 (26%) patients, the arm in 89 (28%), and the forearm in 150 (46%). Primary lesions sized < 5 cm in 148 (46%) cases, 5-10 cm in 124 (38%), and >10 cm in 50 (16%). There were 147 (46%) patients suffering from a primary and untreated tumours, 72 (22%) suffering from a local recurrence after elsewhere excision, and 98 (30%) suffering from a previous inadequate excision elsewhere. Adequate surgical margins (wide and radical) were reached in 257 (80%) cases, while inadequate (marginal and intralesional) were reached in 65 (20%) cases. Adjuvant therapies utilized chemotherapy in 63 cases, external beam radiotherapy in 155, and brachytherapy in 58. A microsurgical flap was used in 70 cases (22%), a rotational flap in 39 (56%), and a free flap in 31 (44%).
Results: After a mean follow up of 61 months (6-292), 243 patients (75%) were continuous disease free, 28 (9%) had non evidence of disease after local or systemic treatment of relapse, 21 (7%) were alive with disease, 30 (9%) died of disease. Local recurrence occurred in 32 cases (10%), i.e. 23 and 9 cases without and with the use of a flap, respectively. A metastatic disease occurred in 60 patients, i.e. 40 and 20 cases without and with the use of a flap, respectively. Local complications related to radiotherapy where observed in 15 (5%) patients.
Survival analyses established that a high grade sarcoma posed a higher risk for death of disease (HR=7.333, 95% CI=3.577-15.032, p=0.001) and local recurrence (HR=3.151, 95% CI=1.099-9.035, p=0.034). Conversely, the use or not of either a free or rotational flap did not show to influence postoperative outcomes.
Conclusions: In our experience, despite due to the malignancy and characteristics of the anatomical site, STSs of upper limb can be often successfully treated. Worst long-term outcomes can be expected in patients suffering from a high grade sarcoma.

Keywords : Upper Limb STSs , Limb Salvage
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Limb salvage in soft tissue sarcomas of thigh: long term results

Abstract ID : 1254
Submitted by : ANTONIO D'ARIENZO the 2016-02-13 19:48:19
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Surgery of Soft Tissue Sarcomas (STSs) is often challenging, and both clinical and procedural factors play a crucial role in the determinism of the expected results. We aimed to review the long term results of STSs of the thigh excised at our Institution (1) assuming the hypothesis that a different anatomical localization of a STS may affect the overall survival and the rate of both local recurrences and metastases.
Materials & Methods: From January 1989 to December 2015 a total of 1318 STSs have been treated; of them, 481 (36%) were located in the thigh, thus being included in this retrospective study.
Patients averaged 56 years (1-94) at surgery. Low grade STSs (Broders 1-2, FNLCC 1) were 139 (11%), high grade STSs (Broders 3-4, FNLCC 2-3) were 342 (89%). The anterior compartment was involved in 45% of patients, the posterior compartment in 31%, and the medial compartment in 24%. Primary lesions sized < 5 cm in 75 (16%) cases, 5-10 cm in 209 (43%), and >10 cm in 50 (41%). There were 356 patients suffering from a primary and untreated tumours, 50 suffering from a local recurrence after elsewhere excision, 63 suffering from a previous inadequate excision elsewhere, and 12 suffering from a metastasis. Adequate surgical margins (wide and radical) were reached in 361 cases, while inadequate (marginal and intralesional) were reached in 120 cases.
Results: After a mean follow up of 58 months (6-256), 305 patients were continuous disease free, 45 had non evidence of disease after local or systemic treatment of relapse, 41 were alive with disease, 75 died of disease, and 15 died of other causes. Local recurrence occurred in 64 cases (13%). A metastatic disease occurred in 112 (23%) patients. Overall free survival was 79.6% at 5 years and 78.1% at 10 years. Local recurrence free survival was 84.2% at 5 years and 82.2% at 10 years. Metastases free survival was 71.5% at 5 years and 70.9% at 10 years. In high-grade sarcomas, there was a slight higher local recurrence survival for the tumors located in the posterior compartment (p=0.052). At the multivariate analysis, local recurrence was found to be predicted by a higher grade (HR 3.826, 95% CI 1.738-8.424, p<0.001), a larger size (HR 1.555, 95% CI 1.015-2.382, p=0.004), and inadequate margins (HR 1.835, 95% CI 1.176-2.865, p=0.008), while radiotherapy showed to reduce the local recurrence (HR 0.473, 95% CI 0.259-0.865, p=0.016).
Conclusions: In our experience, despite due to the malignancy and characteristics of the anatomical site, STSs of the thigh can be often successfully treated. Worst long-term outcomes can be expected in patients suffering from a high grade sarcoma.

Keywords : Thigh STSs, Limb Salvage, Long Term Result
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Liposarcoma: Therapy and Prognosis in Respect to Entity and Resection Margins

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Submitted by : Hans Roland Dürr the 2016-02-04 14:36:48
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Liposarcomas are a heterogeneous group of soft tissue sarcomas representing the spectrum of only local issues (atypical lipoma) to highly malignant lesions. The aim of this study was o identify the tumour- and stage-related treatment options and prognosis in different subtyps.

Patients and Methods
Between 1983-2015 107 resections in 100 patients were done (91 of them in the last 10 years). Those 107 cases are described. The average age of the 59 male was 59.5 years (9-86), that of the 48 female 55.5 years (28-88). An atypical lipoma (liposarcoma G1 of the extremities) was seen in 41, myxoid liposarcoma in 44, pleomorphic liposarcoma in 8 and adedifferentiated liposarcoma in 13 cases. Without 41 atypical lipoma , 23% were G1, 47% G2 and 30% G3. In 69 cases the thigh, in 12 the lower leg, in 6 each the upper arm, the trunk and the popliteal region, in 3 cases the axilla and other regions in the remaining patients were affected. 22 patients (20%) died in the meantime. The follow-up of surviving patients was on average 54.7 (3-332) months.

Results
In atypical lipoma 4 patients died, all unrelated to tumour. 7 patients were R0-, 33 patients R1- and one patient R2-resected. Local recurrence rate was 3/41 (7.3%) (Fig. 1), all had a R1-resection. A dedifferentiation or metastatic disease was not observed. 4 patients were irradiated, there was no local recurrence.
Also favourable was the myxoid subtype (Fig. 2), p=0.034. Only 2 patients had metastasized initialy, another metastasized later. Of the non atypical lipoma 66% had a R0-, 31% a R1- and 3% a R2-resection. In myxoid liposarcoma this did not influence overall survival, but influenced the risk of local recurrence (R0: 3% vs. R1: 31%, p=0.024). In pleomorphic and dedifferentiated sarcomas this was only a trend for overall survival in case of R2-resections (p=0.074, n.s.). For local recurrence, resection margins showed a difference but not significant (R0: 0% vs. R1: 14% vs R2: 50%, p = 0.069).
26% of this group were initially metastasized, further 10% developed systemic disease.
Overall survical was independent to resection margins achieved in both entities, even if this was only <1 mm. In this group only one local reccurence was seen. Survival time was independent to the value of resection margin if this was only R0.
49 patients with non-atypical lipomas were irradiated. This had no significant effect on survival or local recurrence rate.

Summary
Fortunately, atypical lipoma despite mostly marginal resections showed only rarely a local recurrence and no metastasis or dedifferentiation. In myxoid liposarcoma prognosis seems tob e also favourable. Resection margin was just playing a role insofar as a R0-resection, regardless of the distance (in mm), increased local recurrence-free survival but did not improve overall survival. In dedifferentiated and pleomorphic sarcomas between the group of R0 and R1-resected patients local recurrence showed a difference, but this was not significant. The same for overall survival. R2-resected patients in contrast had a severe disadvantage.

Keywords : liposarcoma, resection margins, atypical liompa, reccurence, prognosis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1.jpg, http://sites.altilab.com/files/122/abstracts/figure-2.jpg
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Local Adjuvant Bisphosphonates in the Treatment of Giant Cell Tumors of Bone

Abstract ID : 1210
Submitted by : Werner Hettwer the 2016-02-11 17:35:36
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: In addition to inhibiting osteoclast-mediated osteolysis, Bisphosphonates also induce apoptosis of tumor cells and have shown promising reduction of local recurrence rates in small case series. We have developed a method for surgical reconstruction of cavitary bone defects with a composite, able to locally deliver and elute zoledronic acid (ZA). We report our early clinical results with a combination of both, local adjuvant use and incorporation of ZA into a bone defect reconstruction construct for treatment of giant cell tumors.

Methods: We prospectively followed 7 patients (6f, 1m, mean age 39 (range 21-62)) who underwent surgery for primary (n=3) or recurrent (n=4) giant cell tumor of bone in our department between June 2014 and November 2015. The intervention consisted of thorough tumor removal with curettage, high speed burring and local intra-cavitary instillation of ZA, followed by immediate bone defect reconstruction with a combination of cancellous allograft and a gentamicin-eluting bone graft substitute (Cerament™|G, BONESUPPORT, Lund, Sweden), into which we also incorporated ZA. Patients were followed clinically and with serial x-rays & CT scans.

Results: All patients remain fully ambulatory with good to excellent clinical function and no clinical or radiological evidence of local recurrence at latest follow-up. Progressive signs of radiologic consolidation of the bone reconstruction are evident on x-ray and CT scans in all cases. We observed two complications requiring further intervention, one case of secondary wound dehiscence requiring wound revision and one case of ectopic bone spur formation in an area overstuffed with graft material during the primary procedure. Histology from subsequent removal of this bone spur, 18 months later, confirms abundant formation of vital mature bone in the previously grafted periphery of the lesion.

Conclusion: A joint preserving approach aiming at predictable biologic reconstruction of bone defects resulting from resection of aggressive benign bone lesions is clinically desirable and would appear feasible in most cases, even of primary or recurrent giant cell tumors of bone, where the anatomical location of the lesion is often challenging and complete removal of all pathologic tissue is a prerequisite for clinical success. Effective local delivery and elution of ZA may be a clinically useful adjunct to surgical treatment in such cases, as it appears to substantially decrease the local recurrence rate of giant cell tumors in our patients. However, longer follow-up is required and further studies to confirm this hypothesis are needed.

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Local recurrence and distant metastases in limb/girdle low-grade liposarcoma/atypical lipomatous tumor (ALT) during guidelines-suggested follow up (FU). A retrospective analysis of a 163 patients cohort

Abstract ID : 1151
Submitted by : Michele Boffano the 2016-02-07 03:06:19
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: After an adequate excision of a soft tissue sarcomas (STS) a follow up is mandatory but it should be tailored to individual patient's according to histotype, grading and site of origin. Most guidelines suggest both clinical (history and physical examination) and Imaging studies (X-rays, CT, US, MRI) taking into account only two broad categories (low- and high-grade STS) but ignoring histotype heterogeneity. We reviewed our prospectively collected STS database to assess ALT pattern and risk of relapse in order to confirm our current management.

Methods: In 2001 our regional-based health system adopted a STS guidelines suggesting the following FU for low grade STS: clinical examination every 4-6 months in the first 3 years, every 6 months until the 5th year, then yearly. Patients underwent local and chest imaging (either X-rays or CT) at every appointment. Average cost and exposure to X-rays were computed for the entire FU. We searched for patients affected by ALT with complete clinical records (centrally reviewed histology, surgical record, and at least 3-year FU). ALT-specific overall survival (OS), relapse-free survival (RFS) and local-RFS (LRFS) were estimated according to Kaplan-Meier method.

Results: In the period 2001-2011 163 patients with low grade liposarcoma have been treated. Complete records were available in 152 (93%) cases. Adherence to FU was considered adequate in 127 (78%) patients (median age 58, IQR 50-67; median tumour size 14 cm, IQR 8-19). Median FU was 117 months (95% CI 95-140). Ten-year OS, RFS and LRFS were 100%, 74% and 74%, respectively. Among the 13 (10%) relapsed patients, we observed 13 local relapses and no distant metastases. All local recurrence were surgically excised. Two patients died during their FU for not-related causes. The chest X-rays estimated 10-year FU cost is 450 euros per patient with an average total exposure of 0.9 mSv.

Conclusions: Our study, though retrospective, does not support the systematic use of chest imaging in ALT FU that adds apparently needless costs and low, but not negligible, ionizing radiation risks. The future local guidelines for the management of STS will take into account this results. A defintive international consensus on FU for low grade liposarcomas is advisable.

Keywords : liposarcoma, atypical lipomatous tumour, local recurrence, follow up, metastases
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Local Treatment in Patients with Primary Malignant Bone Sarcomas Complicated with a Pathological Fracture

Abstract ID : 1488
Submitted by : Miriam Schlegel the 2016-02-22 21:36:36
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

Introduction: The purpose of this study was to investigate whether limb salvage can be safely performed in patients with primary malignant bone tumors who sustain a pathological fracture.
Patients and methods: We retrospectively analyzed 205 patients with the diagnosis of either osteosarcoma or Ewing tumor. Survival analysis was performed for all patients and separately for patients with and without a pathological fracture regarding 5-year survival rate, occurrence of metastases and occurrence of a local recurrence.
Results: In the group of patients without a pathological fracture, limb salvage surgery showed no adverse effect on survival (p = 0.943) and no increased rate of metastases (p = 0.133) and local recurrence (p = 0.082). In the group of patients with a pathological fracture, limb salvage surgery showed no adverse effect on survival (p = 0.822), no increased rate of local recurrence (p = 0.450) and a decreased rate of metastases (p = 0.032) compared to patients treated with amputation.
Conclusion: Limb salvage surgery is a safe treatment option in patients with primary malignant bone tumors since the oncologic outcome is comparable to patients treated with amputation.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-pathological-fractures-emsos2016.docx, http://sites.altilab.com/
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Long Term Results of Cemented, Hydroxyapatite Coated Distal Femoral Replacements: Has Aseptic Loosening Been Abolished And If So, Why Do They Fail?

Abstract ID : 1293
Submitted by : Michael Parry the 2016-02-14 17:02:10
Category : Others
Typology : Poster
Status : Validated
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Introduction: Aseptic loosening has been one of the main causes of failure of joint replacements. This is a particular problem following bone tumour resections and reconstruction with endoprosthetic replacement, as the patients are often young and active. Since 1990 we have used cemented rotating hinge prostheses with a hydroxyapatite collar to encourage bone ingrowth and thus reduce the risk of aseptic loosening.
Materials & Methods: We have reviewed the first 20 years experience of prosthesis failure in patients with a distal femur EPR to establish if the hydroxyapatite collar used in distal femoral replacements at the bone prosthesis junction has solved the problem of aseptic loosening, also to establish what the other causes of failure are. Survival information was collected from a prospective database for all patients who underwent a custom made distal femoral EPR with an HA collar between September 1991 and December 2011. Outcomes were recorded in terms of patient death (implant in situ), survival of implant, failure of implant, or amputation and were split by whether the procedure was primary or secondary. Kaplan-Meier analysis was used to estimate survivorship without any of these causes of failure as well as cumulative risk analysis.
Results: 327 prostheses were included in this study, with an age range at insertion of the prosthesis ranging from 10 to 88 (median 26 years). 235 of the procedures were primary implants and 92 were inserted at the time of revision, 69 for aseptic failure and 23 at the second stage of a 2-stage revision for infection. Median follow up for all patients was 8.3 years (range 0.1-23 years). 123 of the patients were dead at the time of final follow-up, but 204 remain alive. The 5, 10, 15 and 20-year survival of the implants without failure according to the Henderson criteria are shown.
Failure was not affected by age (under or over 20), indication for prostheses insertion, time of implantation (before or after 2000), or whether the procedure was a primary or revision. Revision procedures had a lower risk of Type 5 failure (tumour recurrence) but slightly higher infection risk, especially those having revision for infection. Competing risk analysis demonstrated that when death was taken into account as a competing risk the overall survival of the implants without Types 1-5 failure at 20 years was 72%.

Conclusion: The Stanmore cemented, rotating hinge distal femoral replacement has approximately a 1.5% failure rate per year throughout the first 20 years with the principle modes of failure being mechanical breakage and infection. Revision of the prosthesis has a comparable success rate to that of primary procedures. The incidence of complications was greatest in the first 5 years and there was not an observed increase with time. Aseptic loosening has been virtually abolished by the use of the hydroxyapatite collar.

Keywords : Endoprosthesis, Distal Femur, Sarcoma
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Long-term Management of Fibrous Dysplasia of the Upper Limb

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Submitted by : Bas Majoor the 2016-02-14 11:31:53
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Fibrous Dysplasia (FD) is a rare bone disorder in which bone tissue is locally replaced by fibrous tissue. The upper limbs (UL) may be affected, causing pain, fractures and possibly severe deformities. Treatment options consist of conservative treatment, surgical interventions and medical treatment with bisphosphonates. Data on long-term follow-up and treatment outcome of UL lesions are scarce.

Methods
We studied 55 patients with FD of the UL (29 male and 26 female) out of a cohort of 258 patients with FD (21%) who were treated in our centre between 1980-2015. We evaluated surgical outcome in terms of the need re-operation and fracture recurrence. Response to bisphosphonates (BP's) was assessed by clinical response, effect on pain and the effect on bone turnover.

Results
Thirty-five patients had monostotic FD (64%), 12 polyostotic (21%) and 8 (14%) had McCune-Albright Syndrome (MAS). Mean age at diagnosis was 21.1 years (0-63) and mean follow-up was 8.9 years (0-50). The humerus was most commonly affected (93%), followed by the radius (20%) and the ulna (16%). Thirty patients sustained a pathological fracture (26 humeral, 2 radial and 2 combined), and in 46% this was the presenting symptom. Cystic characteristics of the lesions on plain radiography (p=0.037) and a young age at diagnosis (p=0.001) were associated with increased risk of developing a fracture. The size of the lesion was not significant (p=0.286). All 30 pathological fractures were primarily treated conservatively, which resulted in a good outcome in 18 patients (60%), recurrence of fractures in 5 patients (17%), although they eventually had a good outcome, and 7 patients (23%) eventually required surgery.
Twelve patients underwent a total of 21 surgeries, primarily to treat impending fractures (8) or pain symptoms (4). All four patients that received a fibular strut graft had a successful outcome in contrast to 5 patients who were treated with cancellous bone grafting of whom 2 needed a re-operation. Five patients were surgically treated with 14 injections of cysts.
Eighteen patients were treated with bisphosphonates because of biochemically active, symptomatic lesions. Ten patients (56%) had a good response with normalization of bone turnover and relief of pain symptoms and 8 patients, seven of whom had MAS (88%), had only a moderate response to treatment with a decrease, but no normalization of bone and pain symptoms.

Conclusion
FD of the humerus is prone to fractures, especially in patients who are diagnosed at a young age in whom the lesion has a cystic characterization. Conservative treatment of fractures of the UL in FD appears to be acceptable because of successful fracture healing in a majority of the patients. However, surgery is required in case of multiple or impending fractures and contrary to weight bearing limbs, strut-grafts appear highly effective after a fracture. Bisphosphonates appear to reduce pain by a decrease biochemical activity of the lesions, especially in non-MAS patients, but efficacy of treatment remains inconclusive because numbers treated in this series are small.

Keywords : Fibrous Dysplasia, Upper Limb, Cortical Allograft Surgery, Bisphosphonates
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Major amputations for limb sarcoma

Abstract ID : 1463
Submitted by : Gualter VAZ the 2016-02-22 13:19:00
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
In the last decades, due to development of limb salvage surgery in sarcoma treatment, we noticed an important diminution of major amputations. However, some indications still remain and amputations are still required in 5 to 7 % of limb sarcoma cases.
We reviewed retrospectively all cases of major proximal amputations in order to analyze indications, morbidity and postoperative evolution.
Material and Methods
We analyzed retrospectively clinical data of 20 patients treated surgically by major amputation for bone or soft tissue Sarcoma between 2007 and 2015.
Fifteen males and 5 females were included with a median range age of 53 years (24 – 80).
There were 11 Bone Sarcomas (4 chondrosarcomas, 5 Osteosarcomas and 2 others) and 9 Soft Tissue Sarcomas.
We performed 11 lower limb major amputations (6 hip disarticulations, 5 external hemipelvectomies), and 9 upper limb major amputations (5 inter-scapulo-thoracic amputations, 2 scapulo-humeral amputations and 2 trans-thoracic amputations).
Results
The operative 30-day mortality rate was zero. Fifty five percent of patients died after an average time of 16,8 month post surgery, secondary to evolution of the sarcoma disease. Seventy percent of the patients (14/20) had metastatic evolution after an average time of 3,9 month post surgery.
In 13/20 (65%) patients, a major amputation was initially indicated due to the volume and the topography of the tumor (large proximal tumors involving major neurovascular structures).
In 7/20 (35%) patients, major amputations were performed for recurrence of the tumor after initial conservative treatment.
Palliative surgery was indicated in 3/20 (1 in primary indication group and 2 in recurrences group) to treat local major complications (pain, bleeding) due to a locally non-controlled tumor.
In most cases, there was low morbidity due to the surgery, with a short post-operative monitoring in intensive care unit.
Fifty percent (10/20) of patients had postoperative complications, mainly after pelvic amputations (63%). Six infections of the operative area required a surgical debridement. All of the scapulo-humeral amputations and 80% of the forequarter amputations had no postoperative complications.
Discussion & Conclusion
Major amputations still need to be used for treatment of limb sarcoma in the absence of conservative surgical option. Indications are well known : major neurovascular compromise, intractable pain, fungating tumoral growth and impossibility to maintain limb function after surgical resection. The morbidity remains acceptable and the postoperative recovery can be good. Despite major disfiguring result, proximal limb amputation can offer a good oncologic result in selected patients. Bad oncologic evolution is related to initial tumor staging with large locally aggressive tumors. In palliative situations, major amputations can also offer good pain relief and improve quality of life.

Keywords : Sarcoma, major amputation
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Malignant bone tumors profile epidemiological aspects diagnostics and therapetiques Pediatric cancer experience centre CEA ORAN ALGERIE

Abstract ID : 1426
Submitted by : BOUMEDDANE AMARIA the 2016-02-21 22:06:22
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and interests
Malignant bone tumors are rare and constitute 6-10% of childhood tumors. The annual number of new patients with these tumors increases with age, peaking at the age of 15 year ,
On primary tumors, the annual rate of new patients and for different types of bone tumors is represented in 90% of cases of osteosarcoma and Ewing's sarcoma .For secondary tumors, they are represented by bone metastases Frequently neuroblastomas followed by leukemia and histiocytosis
The interest is to know clinically suspected bone tumors and carry the balance necessary for diagnosis of malignancy or benign including biopsy and histopathological study compulsory.
Knowing the main tumor and therapeutic modalities
Material and methods
Retrospective study over a period of 04ans, Western sick and south west Algeria
- Diagnostic Assessment: Standard radiography, CT / MRI cytology / histology, Médullogramme,
- Pretreatment assessment: hematologic, metabolic, hepatic, renal
- Assessment of extension depending on the location especially chest CT in search of pulmonary metastases.
- Chemotherapy after first initial biopsy, then surgery is radical or conservative depending on the location and the response to chemotherapy protocols SFOP
- Radiation therapy as indicated
Results and Discussion
Distribution Wilaya: Oran is ranked first followed by recruitment of neighboring wilaya, Mascara, Tiaret, Mostaganem, Relizane, Tlemcen,
The age group affected our recruitment is between 8 and 15 years, bone tumors occupy sixth place compared to other tumor pathologies
relative frequency of different primary bone tumors:
Predominance of osteosarcoma: 2/3 of our recruitment, followed with Ewing's sarcoma, chondrosarcoma two cases and two cases of histiocytosis compared with solid tumors
For metastatic bone tumors, neuroblastoma ranks first followed by leukemia.
Survival in our study is a priori directly related to the type of bone tumor, 85% à2ans for osteosarcoma and 65% for Ewing's sarcoma tumor location and its accessibility to the surgery and the presence of metastases especially pulmonary.
conclusions
A bone tumor can be benign or malignant primitive or metastatic therefore
A biopsy is warranted before any therapeutic decision.
The diagnosis must be early stage of bone pain which remains the main call sign these tumors order to avoid the extension of the tumor and metastases that affect the vital and functional prognosis of these children
The prosthesis can never replace a member where the preservation of functional outcome by encouraging and improving the methods of conservative surgery, more accepting of improving the methods of conservative surgery, greater acceptance compared to radical surgery Intensified chemotherapy néoadjuvantepour metastatic, nécéssitantl'amélioration resuscitation facilities

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Keywords : Ewing sarcoma, bone tumor, cancer, children
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Management of complications in the proximal femur tumor mega prostheses

Abstract ID : 1474
Submitted by : Hasan Gocer the 2016-02-22 17:26:42
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Proximal femur tumor mega prosthesis (PFM) is generally performed because of metastasis or primer bone tumor. The patients undergone PFM have serious healthy problems such as malnutrition, immunodeficiency, shorter life expectancy. So PFM will increase more of these problems. We evaluated the common complication of PFM.

Materials-Methods: Sixty-six patients with PFM for primary (group I) and metastasis (group II) bone tumor were included in this study. Type of tumor, age, postoperative time, death time, postoperative complication such as infection, dislocation, and revision were evaluated.

Result: Sixty-six patients were included between the March 2006 and February 2015. There were 42 men and 24 women with an average age at time of surgery were 54.7 years (range eight to 82 years). Group I was 23 (34.8 %) patients, group II was 43 (65.2 %) patients. Postoperative follow-up time was 19.8 months (1 – 96 months) in 66 patients. Median survival time of patients who died after surgery was 17.6 months in group I and 13.4 months in group II. Attachment tube was used some of patients to prevent dislocation. Dislocation was seen in 10 (15 %) patients (3 of them in group I and 7 of them in group II). Infection was seen in 13 (19 %) patients (5 of them in group I; 8 of them in group II).

Conclusion: Dislocation and infection in PFM is a common complication. They may be associated with immune compromise, large bone or soft tissue defects, long operative time.

Keywords : Bone tumor, metastasis, mega prostheses, survival.
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Massive facet joint synovial cyst with endocanalar invasion

Abstract ID : 1238
Submitted by : Pedro Barreira the 2016-02-12 19:56:30
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Facet joint synovial cysts are a cause of back pain and radiculopathy. Although originally felt to be uncommon, the advent of cross sectional imaging techniques such as CT and MR have led to an increase in the recognition of these lesions. Synovial cysts typically arise in association with osteoarthritis of the facet joints. They are most often found in patients over 50 and are more common in females. Degenerative spondylolisthesis is frequently present in these patients, and L4-5 is the most common level of abnormality, rarely occur in L3-L4, L2-L3.
They may be asymptomatic and found incidentally. The epidural growth of cysts into the spinal canal causes compression of neural structures and their associated clinical symptoms. The clinical presentation of a cyst depends on its volume, site and its relationship to the surrounding bony and neural structures.
Most of the symptomatic patients present with radicular pain and neurological deficits. A history of low-back pain invariably precedes the radicular pain (range from 50 to 93%). Most commonly occurring symptom of synovial cysts of the spine is painful radiculopathy, which may be unilateral or bilateral, reported in 57–100% of cases. Neurogenic claudication is the next most frequently reported symptom ranging from 10 to 44%. This is followed by neurological deficits. Other sign and symptoms including cauda equina syndrome (range 1–13%). lateral recess and spinal stenosis syndromes have also been reported.
Plain radiographs have little diagnostic importance in identifying synovial cyst but are useful in excluding other conditions, such as spondylosis, degenerative spondylisthesis and metastatic lesions.
Computed tomography scanning and MRI are the two neuro-diagnostic imaging modalities recommended for characterization of synovial cysts and preoperative planning. MRI will demonstrate not only the nature of the cystic lesion, but also its relationship to the thecal sac.
Surgical treatment is largely recommended in all cases of intractable pain or neurological deficit. The surgical technique will depend on the site, size and other factors such as duration of symptoms and involvement of surrounding structures. In general current therapy for synovial cysts includes excision of the mass (total or partial) and lumbar decompression
Clinical case
Female patient, 75 years, with intense progressive back pain with irradiation to the right leg for more than 6 months, resistant to conservative treatment. She also presented herself with intermittent neurogenic claudication. The MRI showed a L2-L3 massive lesion with neurologic compromise, probable a cystic lesion, with endocanalar invasion. It was decided to perform an excisional biopsy and postero-lateral arthrodesis with posterior pedicular instrumentation L1-L2-L3. Histology confirmed to be a spinal synovial cyst. During follow up she recovered and became asymptomatic.
Conclusion
Improved imaging capabilities have resulted in increase reporting, diagnostic yield and treatment options of spinal synovial cysts. A variable incidence has been described in the literature; it is thought that it may be less than 0.5% of the general symptomatic population. They may be asymptomatic and found incidentally.
MRI is the tool of choice for diagnosis.
Synovial cysts resistant to conservative therapy should be treated surgically.

Keywords : cyst, radiculopathy, arthrodesis, claudication
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Mazabraud's Syndrome; A Case Series of 12 patients

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Submitted by : Bas Majoor the 2016-02-22 09:28:03
Category : Others
Typology : Poster
Status : Validated
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Introduction
Mazabraud's Syndrome (MS) is a rare disease, characterized by the combination of Fibrous Dysplasia of bone (FD) and Intramuscular Myxomas (IMM). The myxomas are believed to develop at a later stage than the underlying FD and more often in patients with polyostotic disease. We present the largest cohort known to date.
Patients and Methods
A case series of 12 patients with MS (5 males and 7 females) who were followed in our centre between 1980 and 2014. This group of patients represents 5% out of a cohort of 258 known patients with Fibrous Dysplasia, followed up in our centre.
Results
Average follow-up was 19.6 years (range 1-51) and FD was diagnosed at a significantly younger age than MS (p=0.018) with a mean age of 34 years (range 0-61) compared to 44 years (range 19-61) in MS. Two patients had monostotic FD, eight had polyostotic FD (PFD) and two patients had McCune-Albright Syndrome (MAS). Clinical symptoms at diagnosis of MS were pain (33%) or swelling (25%). The myxomas were asymptomatic and incidentally diagnosed at routine screening of the FD lesions in 42% of the cases. The majority of the myxomas developed in the upper leg (10), one in the shoulder and one in the flank. The myxomas were localized near FD lesions of the bone in all patients and the mean number of myxomas per patient was 4.5 (± 5.4 SD).
Indications for surgery were continuous pain (4) and to exclude the diagnosis of a soft tissue malignancy (1). Five patients had surgical excision of one or more myxomas and excision of the lesions led to a decrease in pain complaints in all patients. However, two patients eventually needed a re-excision due to recurrence of the myxomas at the initial site and associated complaints of pain. Diagnosis of MS was histologically confirmed in 6 patients (46%). Mutation analysis revealed the GNAS R201H -mutation in one patient and no mutation of the GNAS-gene in three other patients. None of the patients developed malignant transformation of the myxomas. However, three patients had a distinct cellular morphology, which was associated with a recurrent nature in all and multiple resections in one.
Conclusion
Patients with FD may develop Mazabraud Syndrome, seldom in monostotic FD, more common in polyostotic FD and often in MAS. Myxomas appear to develop at a late stage in the natural history of Fibrous Dysplasia. Resection of the myxomas provides a good outcome, although recurrence and multiple resections may prove necessary, especially in patients with a cellular morphology.
We would like to invite all centres to join us in a European multicentre study and to start an EMSOS based study into this very rare disease.

Keywords : Mazabraud's
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Medium to long-term results of a non-invasive extendible endoprosthesis for paediatric tumour surgery

Abstract ID : 1184
Submitted by : Aurelie Hay-David the 2016-02-10 16:00:39
Category : Others
Typology : Poster
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Introduction and Objectives In 2002, a non-invasive extendible endoprosthesis was first used in our bone tumour unit for limb salvage surgery for skeletally immature tumour patients. We present our experience of the medium to long term implant survival and complications for patients using the Juvenile Tumour System (Stanmore Implants, Worldwide). Method Between 2002-2009, 57 skeletally immature patients were identified retrospectively from the bone tumour database as having a lower limb bone tumour and underwent resection and reconstruction with this non-invasive extendible endoprosthesis. The procedures were conducted by the senior authors. Results There were 32 males and 25 females. Primary diagnosis included 43 osteosarcomas, 12 Ewing's, 1 chondrosarcoma and 1 aneurysmal bone cyst. The custom made endoprostheses included 48 femoral and 9 tibial endoprostheses. Mean age at surgery was 10.3 years(5-14). The mean length gained was 50.8mm(0.5-140.5), requiring a mean of 12 lengthenings(1-40). Once maximum lengthening was achieved, eight patients required a mean of 1 revision (1-3). Of the survivors, 88% (39/44) had equal leg length at skeletal maturity. Mean follow up was 81 months (range 51-143) with a mean age of 18 years(10-24). Mean interval to either further/revision surgery or to death, was 26.8 months(5-79). At a minimum follow up of 6 years, there are 44/57(77%) survivors. Causes of death: neutropenic sepsis (1) and disease recurrence/metastases (12). Of the survivors, 17 patients have retained their original prosthesis without revision nor complications. Kaplan-Meier survival analysis was used to examine survivors with no implant failure: 80% of children were alive and free from failure at 1 year, falling to 67%, 46% and 37% after 2, 5 and 10 years, respectively. Individual modes of implant failure were identified using the Henderson et al. classification: Type III (Structural) had the highest rate of failure, falling from 4% at 1 year to 69% at 10 years; Type V (Progression) had the lowest: 2% at 1 year falling to 6% at 10 years. Overall, 86% of patients were free from any type of failure after 1 year, falling to 56% and 45% at 5 and 10 years. When survival of the individual endoprosthesis type was compared, there was no significant difference using a logrank test (p=0.60). At the last known full clinical assessment of the 44 surviving patients, mean MSTS was 24.7(8-30) and mean TESS score was 92.3%(55.2%-99%). At that point, mean knee flexion was 111.7o(70o-130o).Conclusion The need for long-term follow-up of this group is essential. In addition to the risk of implant failure, the lengthening process is not without risks that include refractory stiffness, femoral head proximal migration / subluxation and foot drop. Due care must be taken to ensure that lengthening is not done too much or too quickly. Once these patients reach skeletal maturity revision to an adult prosthesis is not required. We advocate ongoing studies to follow this complex group of patients: to monitor disease progression; long-term complications of implant use and overall, to improve care for these and future patients.

Keywords : Extendible endoprosthesis, non-invasive, paediatric bone tumours
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Metastatic pathological fractures of the femur: treatment and outcomes

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Submitted by : Santos Sandra the 2016-02-22 23:06:13
Category : Others
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Introduction: Due to the advances in oncological therapy, the life expectancy of patients with malignant tumors, and consequently the incidence of pathological fractures, has increased over the last decades. Pathological fractures of the long bones are common complications of metastatic disease. The aim of this study was to evaluate the outcome after surgical treatment of pathologic fractures of the femur with an intramedullary nail.
Materials /Patients and methods: We performed a retrospective review of patients treated for pathological femur fracture in our department, from 1998 to 2014 (16 year-period). Demographical data, primary tumor distribution, treatment and associated complications were reviewed.
Results: A total of 55 patients (32 female), with a mean age of 63 years (32–90) were identified and reviewed. Of these, thirty were consummated pathological fractures, and the remaining were imminent fractures of the femur. In 58.5% (n=?) of cases the fracture line was located to the proximal third of the femur. Breast cancer was the most common primary tumor (n=27), followed by lung (n=9), prostate (n=7) and renal cancer (n=5). The treatment of choice was internal fixation with intramedullary nailing; in 40 cases, stabilization was achieved with a long cephalomedullary nail, and in the remaining 15 a standard intramedullary nail was used. In all cases, an unreamed and locked nail was used; in 8 patients, enhanced fixation with PMMA (onde?) was performed. Most of the patients underwent adjuvant radiotherapy. There was no mortality related to the surgical procedure, and no intra-operative complications occurred. Post-operative complications reported (n=3) were related to failure of fixation.
Discussion and Conclusion: Early palliative and preventive treatment of pathological fractures of the femur is indicated in most patients with advanced stage metastatic disease. Low complication rates, pain relief and early mobilization justify surgical stabilization of fractures in this group of patients. Intramedullary nailing represents a valuable fixation method for pathologic fractures or imminent fractures of the femur; it provides adequate stability to outlast the patient's remaining life expectancy, with better quality of life.

Keywords : Pathological Fracture, Metastatic Disease, Femur
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Metastatic pathological fractures of the humeral shaft: treatment and outcomes

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Submitted by : Santos Sandra the 2016-02-22 23:13:39
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Authorisation to disclose : Yes/Oui

Introduction: Metastatic bone disease is the most common cause of destructive bone lesions in adults, and involvement of the humerus is common. This study aims to evaluate the outcome after surgical treatment of humeral pathologic fractures with an intramedullary nail.
Materials/Patients and Methods: Retrospective study of patients surgically treated for pathological metastatic fractures of the humeral shaft in our department, from 2000 to 2013. Demographical data, primary tumor distribution, treatment, associated complications and survival rate were reviewed. Function of the upper limb was assessed using the Musculo-Skeletal Tumor Society (MSTS) rating scale.
Results: A total of 59 (41 female) patients (mean age 60 years) were identified, with 62 fractures (three bilateral cases). There were 55 pathologic and 7 impending fractures; 33 cases affected the right side. Histotypes of the primary tumor were breast (n=22), multiple myeloma (n=15), lung (n=5), kidney (n=3), prostate (n=2), lymphoma (n=2), colon-rectum (n=2), bladder (n=1), larynx (n=1), melanoma (n=1), hepatocellular carcinoma (n=1), hemangiosarcoma (n=1), hemangiopericitoma of the brain (n=1), cervical cancer (n=1) and unknown tumour (n=1). 36 patients were stabilized with an antegrade intramedullary nail and 27 with a retrograde intramedullary nail; all were unreamed and locked. Mean operative time was 100 minutes (45-225 minutes). Blood transfusion was necessary in 20 patients. MSTS rating score for the upper limb showed a remarkable improvement of function and pain; overall, relief of pain was achieved in 92%. There was no mortality related to the surgical procedure, and no intra-operative complications occurred. Post-operative complications reported (n=2) included impingement syndrome and iatrogenic fracture. Mean survival time was 10,4 months.
Conclusion: The progress in surgical techniques and improvement of cancer therapies has contributed decisively to a significant increase in survival and quality of life of cancer patients. We believe that humeral diaphyseal lesions should be surgically stabilized in order to improve pain, function and quality of life. An antegrade or retrograde unreamed intramedullary locked nail appears to be the best choice: it is a simple technique, minimally aggressive, and allows for a rapid return to normal limb function and significant symptomatic relief.

Keywords : Pathological Fractures, Metastatic Disease, Humeral Shaft
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Minimally invasive extreme lateral approach for the treatment of metastases in the lumbar spine: technique and literature review

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Typology : Poster
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INTRODUCTION: The extreme lateral approach was developed to be used via the retroperitoneal space and introduced as an alternative method for accessing the anterior spine. It has been widely used for the treatment of degenerative diseases. The objective of this study is to present a minimally invasive extreme lateral approach for the treatment of metastases in the lumbar spine.
PATIENTS: Two patients with spinal metastases and indication for surgery with the anterior approach were treated in the Cancer Institute, Hospital das Clínicas, São Paulo (SP), Brazil. They were put in right lateral decubitus, and the incision was oblique, exposing the psoas muscle. Through the anterior approach, it was possible to undermine the fibers of the vertebral body and disc, without using the evoked potential exam (MEP).
RESULTS: There was no worsening of neurological deficit. Both patients needed to stay one day in the intensive care unit postoperatively. Pain, as assessed by the visual analogue scale (VAS), was 6/10 in the immediate postoperative period and 3/10 in the late postoperative period (average). Both patients could walk with assistance in the first day after surgery, and without assistance in the second day, and both were discharged in the third day.
CONCLUSIONS: When cancer cure is not expected anymore, minimally invasive extreme lateral approach for the treatment of tumor metastases in the lumbar spine is a viable option. As with any minimally invasive surgery, this technique allows short period of hospital stay and low morbidity compared to other approaches. Clinical studies are needed in order to provide the extension of these benefits to cancer patients for whom there is an option for treatment for the primary disease.

Keywords : Minimally invasive, extreme lateral, lumbar spine, metastases,
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Modular prosthesis vs 3D implants in reconstruction of massive pelvic defects.

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Typology : Poster
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Surgical treatment of primary malignant bone tumors has radically changed in recent years since modern imaging, modern reconstructive surgery techniques were put into use. In massive or neglected bone tumors there is a frequent dilemma whether reconstructive surgery is a reasonable treatment or not. The aim of the study is to show the results of treatment in advanced cases of pelvic tumors
Material was composed of 40 selected patients who had undergone hemipelvectomy and were hospitalised at The Department of Orthopaedic Oncology of Pomeranian Medical University of Szczecin, Poland between 2000 and 2016 . All of them were diagnosed with advanced forms of primary pelvic tumors and were qualified for salvage surgery. The following surgical techniques were used to reconstruct the defect: en bloc tumor resection without internal fixation, en bloc tumor resection with internal fixation, tumor resection with bone graft and internal fixation, total joint or bone replacement with LUMIC prosthesis in 12 cases, hemipelvectomy with 3D custom made reconstruction in 4 cases, sacrectomy in 4 cases. The folow up varied between 12 months and 5 years in different patients.
Nineteen patients died of tumor progression, three patients who developed metastatic disease or had metastatic lesions, initially, are still alive, in 18 cases the performed treatment was successful in long term follow up. The functional results were satisfactory in most cases even in the group with poor survival especially in the group of patients with 3D reconstruction. Patients who were treated with LUMiC prosthesis had similar oncological outcome but presented with higher complication rate.
One of the main conclusions emphasized by authors is the problem of frequently seen late diagnosis which in most cases is the basic reason for recurrence and bad final result. The key role is the plan how to reconstruct the huge defect and what implant shoud be chosen from anatomical and biomechanical point of view. The tendency to limit the indications for amputation or disarticulation even in cases of advanced tumors was put forward.

Keywords : 3D implants, pelvic reconstruction
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-emsos-2016.pdf, http://sites.altilab.com/
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MRI-guided biopsy of soft tissue tumors – accurate, reliable, and safe

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Submitted by : Christophe Kurze the 2016-02-14 19:00:17
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Every soft tissue mass suspicious for soft-tissue sarcoma (STS) requires histopathological work-up. For years open surgical biopsies have been the gold-standard for obtaining adequate and representative samples of tissue for the diagnosis of musculoskeletal lesions. However, because of improved histological and immunhistochemical methods, requiring less tissue to make a specific diagnosis, percutaneous image guided biopsies took on an important role. Image-guided core-needle biopsy (CNB) provides high accuracy in obtaining tissue samples and is associated with low complication rates. Most often, image-guided biopsies of STS are performed under ultrasound (US) or computed tomography (CT) guidance. The reported accuracy of both technics is similar to the accuracy of open surgical biopsies. Considerably fewer experiences are reported for MRI-guided biopsies of suspected STS. This study aimed at investigating the accuracy and safety of MRI-guided biopsy of musculoskeletal lesions suspicious for STS.
Patients and Methods:
30 consecutive MRI-guided biopsies of suspected STS in 29 patients (15 male, 14 female) performed between January 2014 until October 2015 were retrospectively analyzed. All MRI-guided biopsies were performed by two interventional radiologists in a 1.5T wide board MRI-Scanner (Magnetom Aera, Siemens, Erlangen, Germany) by using a normal flex-coil or a custom made loop-coil. Tissue samples were taken with MRI-compatible coaxial full automatic biopsy-devices with a size range from 14-18 G. Biopsy tracts were planned on the basis of an interdisciplinary discussion between tumor surgeons and interventional radiologists. A biopsy was rated technically successful if a sample of the target lesion was obtained. Successful biopsies were classified as diagnostic or non-diagnostic depending on whether a diagnosis could be established from the sampled tissue. The agreement of histological diagnoses from biopsies and surgical specimens served to determine the accuracy of the MRI-guided biopsies.
Results:
All 30 MRI-guided biopsies were technically successful. There were no early or late onset complications noted. In one patient there was a mismatch between histopathology and diagnostic imaging morphology of the lesion. This patient underwent incisional biopsy, which confirmed the initial diagnosis. One out of 30 biopsies was non-diagnostic and required repeat MRI-guided biopsy. The repeated biopsy was diagnostic, resulting in a final success rate of 97%. 11 lesions were classified as malignant and 18 as benign. In the biopsy-diagnosed malignancy group 10 patients underwent surgical resection of the tumor. In all cases the specific diagnosis made on the biopsy-sample was confirmed.
Discussion:
MRI-guided CNB is an accurate, reliable and safe procedure for diagnosing soft tissue lesion suspected for STS. The complication rates are minimal and the repeat biopsy rate is similar to incisional biopsy and other image-guided methods. But, compared with other image-guided methods or open surgical biopsy, MRI-guided biopsy offers the advantages of an excellent soft tissue contrast without using contrast media, targeted biopsy of specific (high-grade) regions, 3-dimensional planning of the biopsy tract and real-time imaging during biopsy. MRI-guided biopsy, performed by a multidisciplinary team specialized in musculoskeletal tumors, offers significant advantages over US- and CT-guided biopsy and has become the standard biopsy procedure at our institution.

Keywords : MRI-guided biopsy, soft-tissue sarcoma, core needle biopsy, radiology
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Myoepithelial carcinoma of soft tissue

Abstract ID : 1491
Submitted by : Daniela Macedo the 2016-02-22 21:52:32
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Myoepithelial carcinomas are a rare tumors with principal location in skin and salivar glands. In 2003, Hornick and Fletcher reported a large-scale study of myoepithelial tumors of the soft tissue, making this entity recognized within the soft tissue sarcomas spectrum. The authors present two case report of myoepithelial tumors of soft tissues.
Case Report: One case concerns a 54 years old female, who in May 2013 resorted to their physician because of a mass on anterior face of the left forearm with about 10 years of evolution, which showed fast growth in the last four months. It had about 3 cm long axis, hard consistency and it was painful to mobilization. In CT and MRI of the left arm was identified a heterogeneous mass of soft tissue associated with erosion of the distal extremity of the ipsilateral radium, without vascular invasion or distant metastases. She was referred to our institution and underwent to tumor resection in June 2013. The histology revealed myoepithelial carcinoma of low grade with small component of dedifferentiation and R1 margins. After multidisciplinary discussion she did adjuvant radiotherapy and stayed on surveillance since then (30 months with no evidence of disease). The other clinical case refers to a 23 years old male, asymptomatic, which in routine chest X-ray performed in September 2014 was identified a mass on the right lung. The CT revealed a 5 cm mass in the upper right chest with erosion of the inner face of the 1st rib; there was also a 2 cm mass near proximal extremity of the 2nd right rib, without invasion of nerve roots or vessels. The histology revealed neurofibroma. In February 2015 there was a compression of C7-D12 conjugation holes. Due to neurological impairment he was submitted to surgery (May 2015). The histology revealed a low grade myoepithelial carcinoma with clear cell component. Two months later, there was an increase of the other mass with infiltration of nerve roots, brachial plexus impairment and inflammation of parietal upper right pleura. He did a second surgery in August 2015 whose histology was compatible with the previous one, with negative margins. He was referred to our institution for surveillance. It was decided a tight evolutionary control due to few available therapeutic.
Conclusion: Myoepithelial tumors of the soft tissue are very rare, and are considered to be morphologically the same spectrum as their skin and salivary gland counterparts. Although most myoepithelial tumors follow a benign clinical course, malignant cases do exist. It is quite difficult to predict the biological behavior of myoepithelial tumors. Although the precise criteria for malignancy remain unclear, cytologically malignant cases might have to be radically treated.

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Myxoid liposarcoma with cartilaginous differentiation showing DDIT3 rearrangement

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Submitted by : Kayo Suzuki the 2016-02-03 11:49:11
Category : Others
Typology : Poster
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Authorisation to disclose : Yes/Oui

Introduction: Myxoid liposarcoma (MLPS) is the second most common histologic subtype of liposarcoma. However, cartilaginous differentiation within MLPS is an extremely rare phenomenon. In this report, we presented a case of MLPS with cartilaginous differentiation in which the FUS-DDIT3 fusion gene was detected by fluorescence in situ hybridization (FISH) analysis and reviewed the literature on MLPS with cartilaginous differentiation.
Case Presentation: A 44-year-old woman had noted a painless mass in the left thigh. The mass had been present for 4 years and had slowly increased in size. Magnetic resonance imaging revealed a 21-cm mass spreading on the lateral muscle component on the axial aspect of the left thigh. The lesion appeared heterogeneously hyperintense and partially hypointense on T2-weighted images. A needle biopsy was performed, and we diagnosed as MLPS. The mass was excised with wide margins, and a sterile portion was submitted for cytogenetic analysis. Histopathological findings showed that a liposarcomatous area was adjacent to the cartilaginous area, which accounted for about 20% of the tumor, had a cartilaginous component with mild cellularity of mature chondrocytes and focally atypical chondrocytes. Based on these findings, the diagnosis of MLPS with cartilaginous differentiation was made. In the cytogenetic analysis, eighteen of the 20 analyzed metaphase cells were characterized by t(12;16)(q13;p11.2). An interphase FISH analysis showed that at least 10% of the cells from both the typical MLPS area and the cartilaginous component area showed a split signal pattern, demonstrating a rearrangement in the DDIT3 gene. The patient developed distant metastasis to the subcutaneous tissue of axilla and lymph node of posterior mediastinum in postoperative 11 months and received continuous chemotherapy.
Discussion: MLPS with cartilaginous differentiation is extremely rare, and there have been only the eight previous cases including our case. In the areas of both typical MLPS and cartilaginous differentiation, the FUS-DDIT3 fusion gene might have the important role for oncogenesis. To date, in the previous reports, it has been suggested that the presence of cartilaginous differentiation with MLPS may be regarded as a good prognosis factor. However, our case developed distant metastasis after operation. Therefore, the relationships between the clinical significance and the presence of cartilaginous differentiation in MLPS are unclear. The mechanism of cartilage differentiation within MLPS and its clinical significance will become clear in the future with examination of more cases.

Keywords : Myxoid liposarcoma, cartilaginous differentiation, cytogenetics, DDIT3 rearrangement
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Neoadjuvant Radiotherapy For Myxoid Liposarcomas: Oncologic Outcomes And Histopathologic Correlations

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Submitted by : BUGRA ALPAN the 2016-02-22 20:23:53
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Introduction: Liposarcoma (LPS) is the most common soft tissue sarcoma of the extremities in adults. The purpose of our study was to evaluate the histopathological features of primary extremity myxoid LPS before and after neoadjuvant radiation therapy in relation to oncological outcome of patients.
Patients and Methods: Retrospective review of 124 liposarcoma patients, who were registered to our orthopedic oncology database between January 1998 and December 2015, yielded 27 patients with primary myxoid liposarcoma located in the extremities. Inclusion criteria were having histopathological confirmation of both the initial biopsy and the resection specimen, and having received neoadjuvant radiotherapy. Demographic, clinical and histopathological data were evaluated.
Results: Over a mean follow-up period of 60,5 (2 - 162) months, 6 patients (22,2%) died secondary to disease progression, leaving 21 patients (77.8%) alive at the time of last follow-up. Only one patient (4%) experienced local recurrence and seven (26%) patients developed distant metastases. Disease-free survival at 5 and 10 years were 69% whereas overall patient survival at 5 and 10 years were 78.2% and 72.6% respectively. Tumor size (>15 cm) and presence of metastases were significantly associated with increased risk of overall mortality.
Histopathology after definitive surgery revealed that tumor necrosis was present in 13 out of 27 patients. Hyalinization/fibrosis was present in all 27 patients while 17 (63%) cases demonstrated 50% or greater hyalinization/fibrosis. The number of specimens, which had round cell component, was significantly lower in the excision group compared to the initial biopsy group (P:0,003). Residual viable tumor cells were present in all tumors. Three patients showed extensive (90 %) hyalinization with 0–10 % residual tumor. Adipocytic maturation / cytodifferentiation was seen on histopathology in 10 out of 27 patients.
Conclusions: The effectiveness of neoadjuvant radiotherapy for myxoid liposarcomas can be demonstrated histopathologically by quantitative analysis of round cells, necrosis, hyalinization, viable tumor cells and adipocytic maturation. Two possible mechanisms by which radiotherapy contributes to tumor control are inhibition of myxoid stroma production by tumor cells and causing direct vascular damage. However, these histopathological parameters did not affect the patients' oncological outcomes. Favorable oncologic outcomes were obtained in this patient series with the combination of neoadjuvant radiotherapy± chemotherapy and surgery.

Keywords : neoadjuvant radiotherapy, myxoid liposarcoma, round cell, hyalinization, fibrosis
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Novel Objective Analysis Methods for Functional Outcomes of Modular Endoprostheses

Abstract ID : 1377
Submitted by : Emrah Caliskan the 2016-02-19 11:13:58
Category : Others
Typology : Poster
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Authorisation to disclose : Yes/Oui

Introduction and Objectives

Limb salvage surgery is the gold standard for treatment of bone sarcoma. Advancement in surgical techniques, implant technology , radiotherapy and chemotherapy increases the survival time of patients with bone sarcoma. This increase also creates an expectation of improvement in life quality and, thus, functional results of reconstructions are becoming a more important consideration. Modular endoprostheses are the major reconstruction technique preferred after resection of bone tumor.The majority of functional analysis of tumor modular endoprostheses are performed subjectively with functional outcome scores such as Musculoskeletal Tumor Society (MSTS) score and Toronto Extremity Salvage Score (TESS). Gait analysis and oxygen consumption measurements are expensive and time consuming objective methods used for evaluation of modular endoprostheses functional outcomes.
Postural instability is affected by proprioceptive dysfunction, muscle weakness and pain, which in turn induce to body sway during walking and standing. It can be measured objectively with The Balance Master (NeuroCom International, Clackamas, Oregon, USA) device.
Physical activity is defined as any bodily movement produced by skeletal muscles that results in energy expenditure. Accelerometers are battery operated electronic motion sensors that measure energy expenditure of the body in one or more planes of movement. ActiCal (Philips Respironics) is an omnidirectional accelerometer that primarily evaluate motion in the vertical plane. Accelerometers are used to investigate patients how they are active during their daily lives. In this study, quantitative analysis of functional outcomes of distal femur resections reconstructed with modular endoprostheses are evaluated objectively by using NeuroCom and ActiCal devices.

Materials/ Patients and Methods

Thirteen patients with modular endoprostheses for their bone tumors located at the distal femur underwent evaluation in the balance laboratory at a mean of 2,9 years after their reconstructions. All patients were than asked to wear accelerometer device at home and in the community for 3 consecutive days.
Results:
MSTS score and total energy expenditure was positively correlated (Spearmans rho: 0,563 p= 0,045). However there was no any correlation between TESS and total energy expenditure (Spearmans rho: 0,394 p=0,182). Patients spent most of their times in sedentary behaviour which was 84,4% of a day. There was a statistically significant difference in walking speed as compared with the control group (patients:64 cm/sec, control:79,5 cm/sec, p=0,005). Sway velocity during sit to stand test is higher than control group. (patient 4,8 :deg/sec, control: 2,8 deg/sec, p=0,005) Flexion, extension, abduction and adduction strength of hip and flexion and extension strength of knee were reduced compared to control subject (p=0,001)

Conclusion

In spite of patient-explained advancement in pain, function and physical activity after modular endoprostheses, quantitative measurements may not reflect the same results. Objective analysis are needed to show real world data of patients functional outcomes with the aim of maximizing their physical activity
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Keywords : endoprosthesis,neurocom,actical,objective,function
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Novel patient specific finite element simulation of femurs with bone metastases significantly improves the ability to identify unnecessary prophylactic surgeries

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Submitted by : Amir Sternheim the 2016-01-30 20:23:40
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Introduction
Long bone skeletal metastases are common, with more than 280,000 new cases every year in the United States alone. Surgeons often face a dilemma whether the metastatic tumor has weakened the bone sufficiently to cause a pathological fracture. Mirels' criteria remains the main scoring system with good sensitivity (correctly identifying impending fractures – about 80%) but relatively poor specificity (correctly identify cases that will not fracture – about 30%).
Novel technology, patient-specific CT-based high-order finite element models (p-FEMs), may improve the ability to predict the risk of fracture in femurs, by improving specificity. These p-FEMs account for the exact geometry and inhomogeneous material properties of femurs, are created in a semi-automated manner from CT scans and have been validated by ex-vivo experiments on femurs with bone metastasis.
The purpose of this study was to retrospectively analyse CT scans of patients with impending femur fractures from metastatic disease who had undergone surgery.

Materials/Patients and methods
CT scans of twenty five patients with femoral bone metastasis who were scheduled for prophylactic surgical fixation for impending fracture were analyzed. For each patient CT based p-FE models of both femurs were created, loaded by a physiological load that represent free walking (based on their body weight and height). Strain levels of each point along the femur were obtained. The risk of fracture was determined using strain-based criteria, in addition to comparative analysis between the healthy and diseased femur. Fracture risk was considered low, and surgery unnecessary, if femurs showed a considerably lower maximum principal strain compared to the ultimate strain (less than 30% of the ultimate strain) and minimal difference was shown compared to the contralateral unaffected femur (less than 25%).

Results
The cohort included 14 female and 11 male patients, aged 17-89 years, with a variety of primal cancers – breast, prostate, renal cell and lung carcinoma and multiple myeloma. The p-FE analyses predicted a very low risk of fracture due to metastases in nine patients (36%). Five patients (20%) had a moderate risk of fracture, and only 11 patients (44%) had a high risk of fracture for which the prophylactic surgery was definitely necessary. An example of a radiograph and p-FEMs of one case for which the surgery was unnecessary are shown in Figure 1.
Figure 1. Left: Radiograph of the femurs of a 43 years old patient with metastatic tumors in the right femur. Right: p-FEMs of the two femurs representing a stance position (colors refer to vertical displacements).

Conclusion
Patient specific p-FEMs identified 36% of patients with only a low fracture risk who had undergone surgery. This tool can significantly improve the specificity of prophylactic fixation of femur metastasis and may avoid unnecessary surgery. A prospective study is ongoing to further validate the p-FEM risk of fracture prediction for daily clinical practice.

Keywords : Finite element analysis, Impending pathologic fracture
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Supplementary material : http://sites.altilab.com/files/122/abstracts/sternheim-emsos-16.docx, http://sites.altilab.com/
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Oncologic Outcome of intracompartment Chondrosarcoma

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Submitted by : Wonju Jeong the 2015-12-12 18:13:52
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Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Chondrosarcoma is the second most common primary malignant bone tumors. Most occurred after 30 and response to chemotherapy or radiation therapy is low, so surgical treatment is generally accepted as the proper treatment. High grade chondrosarcoma is treated by wide resection, but because of complications, low grade chondrosarcoma is usually treated by extended curettage and adjuvant cryotherapy, but it is controversial. The purpose of this study is analysis of chondrosarcoma`s oncologic outcome in our hospital from 1992 to 2015,
Materials and Methods: 1992 to 2015 in our department who had histologically diagnosed as chondrosarcoma treated by extened curretage or wide resection in patients who underwent follow-up for at least 24 months of the 56 patients were studied retrospectively. In addition, age, gender, size, tumor location, histological grade, stage (intracompartment, extracompartment), resection margin that can affect local recurrence or metastasis were analyzed statistically.
Results: 28 people were male and the mean age of 47.7 years. 50 distribution (51-60) was 20 people, and it`s the most common. Proximal huemrus is most affected lesion with the largest number of 17 cases (30.4%) in 56 people. By histological grade, Enneking stage grade I is 32, grade II is 21 cases, grade III is 3 cases. and intracompartment is 37 case, other 19 cases. 4 patients (7.1%) had local recurrence, 1 is occurred by intralesional curettage , 3 is by insufficient wide resection, 4 patients (7.1%) had distant metastasis, 2 is occurred by wide excision, 2 is by insufficient wide resection. Local recurrence and metastasis of chondrosarcoma and significant prognostic factors in relation to the tumor size ($p = 0.021$), pathological grade ($p = 0.03$), surgical resection margin ($p = 0.013$) were all statistically significant.
Conclusion: Our experience is similar to other reports in the literature. Grade 1 and less aggressive form of Grade 2 chondrosarcoma can safely be managed with extended curettage. Wide resection and reconstruction, often entails a possibility of function loss, should be reserve for more aggressive lesions.

Keywords : chondrosarcoma intracompartment
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Ossoscopy for benign osteolytic lesions of the calcaneus

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Submitted by : Andreas Toepfer the 2016-01-06 22:34:52
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: Both unicameral bone cysts and intra-osseus lipoma of the calcaneus are rare entities which are mostly diagnosed due to unspecific heel pain, pathologic fracture or as incidental finding. Minimally-invasive ossoscopy with endoscopic resection of the tumor followed by grafting can potentially minimize risks of open surgery and speed up convalescence. Objective of this study is to present a simple, safe and cost-effective surgical technique for endoscopic surgical treatment of benign osteolytic lesions of the calcaneus.
Description of Technique: We present our modifications to previously described techniques of endoscopic curettage with particular focus on intraosseous lipoma. Key point for grafting is the use of a funnel-shaped ear speculum facilitating the filling of the bone cavity with allogenic cancellous bone chips (Fig.1&2).
Patients and Methods: Between June 2013 and January 2015 ten consecutive patients underwent ossoscopy of the calcaneus. There were 4 cases of intraosseus lipoma and 6 cases of unicameral bone cyst. Radiological results were analyzed using the Glutting-Classification, functional outcome was recorded with FFI.
Results: Radiographic follow-up and functional outcome showed good to excellent results. No differences in outcome was noticed between the two entities.
Conclusions: This technique is a simple and safe procedure for benign osteolytic bone lesions of the calcaneus. Compared to its alternatives, grafting with allogenic cancellous bone might prove favourable in this localization for several reasons: Osteointegration, handling, availability and costs. Our preliminary investigations show promising results although further clinical and radiographic results are needed.

Keywords : unicameral bone cyst, intraosseous lipoma, calcaneal bone cyst, minimally-invasive surgery, foot tumor
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Supplementary material : http://sites.altilab.com/files/122/abstracts/fig.1.jpeg, http://sites.altilab.com/files/122/abstracts/fig.2.jpeg
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Osteoarthritis after curettage-filling cement in the treatment of giant cell tumors around the knee?

Abstract ID : 1048
Submitted by : Alexandre CAUBERE the 2015-12-23 17:23:24
Category : Others
Typology : Poster
Status : Validated
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Introduction:
Fifteen to 20% of tumors of the adult skeleton are giant cell tumors. They have the distinction of being epiphyseal-metaphyseal and are most frequently found around the knee. The treatment consists of conservative surgical curettage associated with a filling of the defect with cement or bone graft.
Our objective was to investigate the prevalence and risk factors for developing an early osteoarthritis in patients who were treated by curettage-filling for giant cell tumors developed around the knee. The secondary objective was whether the replacement of the subchondral bone with cement, had an impact on functional scores and quality of life at follow.
Materials and Methods:
This study was a retrospective and uni- centric. All patients operated on between 2000 and 2010 by the same surgical team were reviewed. The functional scores and quality of life were evaluated for each patient using the Knee Injury and Osteoarthritis Outcome (KOOS), the Musculoskeletal Tumor Society Score (MSTS) and the Short-Form 36 (SF-36). Osteoarthritis was assessed by a comprehensive radiological assessment for which the operated knee was compared with the healthy knee. The result was significant if the Kellgren and Lawrence score was 3 or 4 (KL3-4) and there was a significant difference between the operated knee and the healthy knee.
Results:
Nineteen (19) patients were included in this study. The average follow-up was 120 months. Four patients (21%) had an X-ray progression to KL-3, one patient (0.05%) to a KL-4. One patient underwent total knee arthroplasty. The distance of the tumor with cartilage and the size of the subchondral bone seem to affect the progression to KL 3-4.
Discussion :
Resection of giant cell tumors around the knee by curettage-filling does not seem to influence the development of osteoarthritis when the tumor is away from the joint line. There is indeed a strong correlation between the development of osteoarthritis and the small amount of subchondral bone left in place after curettage. The functional scores and quality of life seem similar regardless of the degree of osteoarthritis present in the patient. Thus the replacement of the fabric subchondral by cement did not appear to influence the quality of life.

Keywords : giant cell tumor, knee, cement, osteoarthritis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/arthrogene-effect-curettage.docx, http://sites.altilab.com/
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Osteochondrolipoma of forearm in a 54 year-old woman; report of a case

Abstract ID : 1351
Submitted by : MEHMET SOYLEMEZ the 2016-02-16 19:34:39
Category : Others
Typology : Poster
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Introduction :
Lipomas are the most common benign soft tissue neoplasms. They can occur anywhere in the body including parosteal surfaces and intracranial spaces. Although doesn't change clinical management, lipomas may show different cell differentations concomitant with major adipocytic differentiation. Most common subtypes are; fibrolipomas, angiolipomas, myolipomas, myelolipomas, chondrolipomas and rarely osteolipomas.
However, lipomas showing both cartilaginous and osseous differentation is a rare and extraordinary situation. As far as we know osteochondrolipoma of forearm haven't been reported previously. The authors present a case of an osteochondrolipoma arising from the subcutaneous tissue of forearm diagnosed in a patient at the age of 54 years. The case and differential diagnose are discussed.
Case:
54 year-old woman admitted to our orthopaedics clinic with a palpabl, painless mass locating at proximal and volar side of left forearm. Mass had noticed firstly 5 years ago and grew by the time. Patient reported no trauma or any disorder in her medical history. Physical examination revealed; normal ROM of both elbow and wrist. Skin was normal, there was no erythema or change in colour. Ultrasonography(USG) and Magnetic resonance imaging (MRI) had performed 1 year ago and showed 7x3 cm mass congruent with lipoma. A control after one year have suggested. However, initial x-ray (Figure 1) and MRI at last edmittance revealed calcific changes in the mass. There was no erosion or involvement in bone tissue. A tru-cut biopsy was suggested for diagnosis. Differential diagnoses were low-grade liposarcoma and atypical lipoma.
Sections obtained by tru-cut biopsy revealed adipose tissue with spindle cells and was small in amount to differentiate the diagnoses. Thus mass was marginally excised. Sections revealed; trabeculae of mature bone, mature hyaline cartilage and endochonral ossification areas among dominantly mature adipoyctes(Figure 2a, b, c and d). Predominantly hypocellular and cellular with spindle cell areas were detected around the bone and cartilage zones(Figure 3a and b). Cellular atypia and necrosis was not detected. immunohistochemical examinations showed S 100 (+) staining (Figure 3c). Ki 67 proliferation index was smaller than 1%. All findings were congruent with osteochondrolipoma.
Discussion
Lipomas showing both cartilaginous and osseous differentation is a rare and extraordinary situation. Osteochondrolipomas of head, neck, chest wall, scapula and mouth have been reported. They can present with or without bone involvement. Aetiology is unknown and constant irritation and trauma have been reported in patients sustained osteochondrolipoma. Pathogenesis of cartilaginous and osseous differentation in these tumors are still remains unknown. Reason is suggested to be either direct differentiation of adipocytes or seconder metaplasia of fibroblasts.
Mesenchymal hamartoma, ossifying fibroma, myositis ossificans, extraskeletal osteochondroma, low-grade fibromyxoid sarcoma and myxofibrosarcoma must be kept in mind as differential diagnoses. However in this case USG and MRI obtained one year ago suggest that the mass had a adipose origin.
As a conclusion, this is the first case reporting osteochondrolipoma of foreoarm. For exact diagnoses pathological examination of whole mass is mandatory. In such cases differential diagnosis can be very difficult or even impossible when little biopsy material is available.

Keywords : Lipoma, osteochondrolipoma, differential diagnosil
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Osteoid Osteomas - Percutaneous Radiofrequency Ablation Outcomes

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Submitted by : Pedro Manuel Serrano the 2016-02-15 20:16:10
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Percutaneous radiofrequency ablation (RFA) has been considered, in recent years, the standard treatment for osteoid osteoma (OO), regardless of anatomic location. Not having pre-operative histological confirmation, diagnosis through clinical assessment and imaging should be as accurate as possible. Additional precautions must be taken when neurovascular bundles or neurological structures are near. Cannulated drills or biopsy needles are an useful option to safely assess the path to the nidus in some cases. Injection of gas or a refrigerated liquid in the epidural space as a protective barrier between the nidus and the spinal cord is also an option.
The aim of this work is to report our experience in treating osteoid osteomas and to assess the efficacy of RFA as the standard treatment method.

Methods: A total of 48 patients (30 males, 18 females; mean age 22 years; range 9-43 years) with OO were treated in the same institution between 2003 and 2015. Seven OO located in the upper limb (proximal humerus, n = 2; elbow, n = 3; radial shaft, n = 1; ulnar shaft, n = 1); 37 in the lower limb (proximal femur, n = 19; distal femur, n = 9; acetabulum, n = 2; iliac crest, n = 1; tibia, n = 6) and 4 in the spine (vertebral body of D8, pediculum of L2, pediculum of L4, second sacral vertebra) were enrolled in the study. A CT-guided RFA was performed, using a cool-tip electrode without the cooling system, heating the lesion up to 90 °C for 6 min. Clinical success, assessed at a minimum follow-up of 1 year, was defined as complete pain relief. Pain and clinical outcomes were scored pre-operatively and at the follow-up with a visual analogue scale (VAS). Early and late complications as well as local recurrences were recorded.

Results: Clinical success was achieved in 45 patients (93.75 %). After RFA, mean VAS score significantly improved from 7 ± 1 to 1 ± 1 ($p < 0.05$). Most patients referred pain relief in the first 48 hours. Local recurrence was found in one patient with an OO of the proximal humerus, associated with pain. A second ablation was performed, however, at maximum follow-up, residual pain was still present. One of the patients that underwent thermoablation of a lumbar OO and was also submitted to gas injection in the epidural space because of its proximity to neurological structures, initiated an aseptic meningitis syndrome post-operatively, that totally recovered after 4 days. Another patient referred severe sciatic pain after surgery, that disappeared after 48 hours. Two patients with OO of the tibial shaft developed osteomyelitis after RFA. One occurred due to infection of the needle path with a methicillin sensitive Staphylococcus aureus. It was treated after 4 weeks of antibiotherapy. The other was in fact a Brodie abscess that was mistakenly diagnosed as an OO at the initial assessment. No more complications were detected after RFA.

Conclusion: CT-guided RFA of osteoid osteomas is a safe and effective procedure.

Keywords : Osteoid Osteomas, Percutaneous Radiofrequency Ablation, Thermoablation, New Techniques, Neurological Protection
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Osteosarcoma of the proximal femur: a difficult diagnosis with prolonged medical wandering

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Submitted by : Meryl Dahan the 2016-02-22 19:52:11
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Epiphyseal and metaphyseal femoral localization in osteosarcoma is rare. Clinical and para-clinical presentation of these tumors is unusual.
To avoid misdiagnosis and management , the specific symptomatology of osteosarcoma in this location should be known. Material and methods: Twelve cases of metaphyseal and epiphyseal osteosarcoma of the proximal femur treated at one institution between 1986 and 2014 were retrospectively reviewed. All of them had a plain radiography, six had a CT-scan and ten had a MRI. Ten patients had a biopsy. Two patients underwent total hip prosthesis before diagnosis of osteosarcoma in error: one for avascular osteonecrosis of the femoral head and another one for a split of the femoral collar.All patients except one received neoadjuvant chemotherapy before an extensive resection surgery. Results : The average age of patients was 36 years (14-64 years). The average follow-up was 5 years(3-188 months). During follow-up , two patients had local recurrence and seven patients had metastases. At last report , four patients had died , four were alive without evidence of recurrence and three live with their disease. Conclusion: Osteosarcoma of the proximal femur are uncommon and are often at the origin of a misdiagnosis and therefore a inadequate therapeutic management. A surgical biopsy should be performed systematically on an atypical lesion of the femoral collar. It is a very important point that these patients should be addressed in a specific center.

Keywords : osteosarcoma, proximal femur, bone tumor
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Our experience in CT-guided radiofrequency for the treatment of osteoid osteoma

Abstract ID : 1339
Submitted by : Israel Pérez-Muñoz the 2016-02-16 00:11:56
Category : Others
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Authorisation to disclose : Yes/Oui

Introduction. Percutaneous CT-guided radiofraquency ablation (RFA) has become the standard for the treatment of osteoid osteoma (OO). The aim of this study is to analyse our experience focusing on radiological features of this entity and on treatment results after RFA
Material and methods.
This is a retrospective study of our database between 2003 and 2015. There are 31 patients, 19 males and 12 females. The mean age of presentation is 17,2. 24 osteoid osteoma were localised in the lower limb, and all but one were in the cortical bone. All cases were treated by percutaneous CT-guided RFA. We heat the electrode up to 90º during 4-6 minutes. The mean follow-up was 22 months ranging from 3 to 44 months.
Results. 87,09 % (27/31) of the patients had initial full response that was kept during the follow-up. We did not have any of the complications related to this treatment. The 4 OO who did not respond to RFA were located: 2 in distal femur, 1 in proximal femur an 1 in the base of second metatarsal. We tried a second RFA in one patient without any success. Finally, the remaining 4 patients were treated by conventional surgery.
Conclusions. CT-guided RFA is a minimally invasive, safe and highly efective treatment for this condition. Thus, this technique is the first choice of treatment and our results are comparable with those reported in the literature.

Keywords : osteoid osteoma, radiofrequency ablation.
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Outcome After Fixation of Metastatic Proximal Femur Fractures: A Systematic Review of 40 Studies

Abstract ID : 1450
Submitted by : Stein Janssen the 2016-02-22 09:56:18
Category : Others
Typology : Poster
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Introduction and Objectives: Endoprosthetic reconstruction, intramedullary nailing, and open reduction internal fixation (ORIF) are commonly practiced for treatment of metastatic proximal femur fractures. This review aims to summarize current literature to help inform patients about expected outcome and to aid surgical decision making. We asked the following questions: (1) what is the functional outcome after surgery for metastatic proximal femur fractures, and what is the (2) local and (3) systemic complication rate? We compared these between surgical strategies.
Methods: Pubmed, Embase and the Cochrane database were searched for literature, published between 1980 and September 2015. We included 40 studies describing: (1) functional outcome using a standardized instrument, (2) local complications requiring reoperation (overall, deep infection, fixation failure), and (3) all systemic complications. The studies described 58 treatment arms including 2692 metastatic fractures: 23 studies reported on 1461 endoprostheses, 24 studies reported on 1054 intramedullary nails, and 11 studies reported on 233 ORIFs. Functional outcome and systemic complications are narratively reported, random-effects meta-analysis was used to create pooled effect estimates for local complications that required reoperation.
Results: Five studies reported an average Musculoskeletal Tumor Society (MSTS) score ranging from 51 to 74% in 95 patients after endoprosthetic reconstruction; one study reported an average MSTS score of 80% in 24 patients after intramedullary nailing; and one study reported an average MSTS score of 80% in 17 patients after ORIF. Two studies reported a Toronto Extremity Salvage Score of 67 to 71 in 16 patients after endoprosthetic reconstruction. We found a pooled overall reoperation rate of 5.2% (95%CI 2.9 to 8.1%) for endoprostheses, 4.2% (95%CI 2.0 to 6.8%) for intramedullary nails, and 14% (95%CI 7.3 to 22%) for ORIF. The pooled reoperation rate for deep infections was 0.68% (95%CI 0.00 to 2.05%) for endoprostheses, 0.04% (95%CI 0.00 to 0.54%) for intramedullary nails, and 0.00% (95%CI 0.00 to 0.92%) for ORIF. The pooled fixation failure rates requiring reoperation was 0.4% (95%CI 0.0 to 1.3%) for endoprostheses, 2.8% (95%CI 1.1 to 5.0%) for intramedullary nails, and 10% (95%CI 4.3 to 17%) for ORIF. Only 14 studies reported on 54 systemic complications after 16 treatment arms: the rates varied from 1 to 8% after endoprosthetic reconstruction, 0 to 27% after intramedullary nailing, and 0 to 8% after open reduction internal fixation. Deep venous thrombosis (17), pneumonia (9), and pulmonary embolism (6) were most common.
Discussion/Conclusion: All three surgical strategies result in reasonable function on average; however, the wide ranges indicate that both poor and good functional levels are obtained. We found that the overall reoperation rate was comparable for endoprosthesis and intramedullary nailing, but was higher for ORIF. Deep infection seems to occur more commonly after endoprosthetic reconstruction, while fixation failure more commonly occurred after intramedullary nailing and ORIF. Our findings could aid surgical decision making and help inform the patient.

Keywords : proximal femur; metastases; metastatic disease; cancer; pathological fracture
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Outcomes of amputation for treating sarcomas of the limbs

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Submitted by : Marta Sofia Santos Silva the 2016-02-22 23:43:49
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Introduction and Objectives: At the present time, limb-salvage surgery is the most common surgical approach for treating sarcomas. However, when it isn't possible, amputation is needed. The aim of our study is to evaluate outcomes of sarcomas that underwent amputation.
Methods: Retrospective and observational study, where patients with sarcomas of the extremities that underwent amputation between 2003 and 2015 were included. A total of 22 patients were identified, with a medium age of 61.7 years.
Results: Tumours were mostly located on the lower limb (68.2%) and 40,9% in the hands and feet. Condrosarcomas constituted the most frequent histologic type (22.7%) and 68,4% were high grade tumours. Amputation was mainly performed with curative intent (95.0%) and transtibial amputation was the most frequent type performed (23.8%). Among the reasons for amputation, tumour extension was the most common (68.1%), followed by neurovascular invasion (19.1%) and palliation for ulcerated tumour (9.5%). Local recurrence was the motive in 38.0% of the patients. The medium survival time in this group was of 41.4 months. Only one patient had local recurrence (4.7%), but 57.1% of cases had distant metastases. Average functional outcome was 54.1%, and higher values of functionality were registered for upper limb amputees (64.1%) than lower limb amputees (48.2%).
Discussion/Conclusion: Factors which may indicate the need for amputation are tumour extension, neurovascular bundle invasion, ulceration to skin and local recurrence. Despite being a potentially disabling surgery, patients that cannot undergo limb-salvage surgery may benefit from amputation, controlling the disease and maintaining acceptable function.

Keywords : sarcomas, limb-salvage surgery, amputation, condrosarcomas
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Paediatric registrations in the French Bone Sarcoma Network (RESOS) allow a better knowledge of epidemiology and treatment characteristics of pediatric bone sarcoma cases in France

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Submitted by : Dumoucel Sophie the 2016-02-22 17:52:06
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Typology : Poster
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Authorisation to disclose : Yes/Oui

Particularity of sarcomas is about its rarity, its age distribution and its multidisciplinary approach and treatment. In France, sarcomas are treated in multiple institutions and it's difficult to have a precise idea of epidemiology and treatment because of the lack of specific and exhaustive registers. Since 2012, a national French register (RESOS) has been labeled by the National Cancer Institute (INCA) to record all data about French adult patients suffering from bone sarcomas. This network also allows a systematic pathological review for all registered cases. Since 2013, pediatric patients have also been registered. Every year, the number of pediatric inclusions increase, with 129 pediatric patients in 2013, 144 in 2014 and 203 in 2015, which represents 14.5% of all patients in this register. Regarding 2015, median age at diagnosis was 16.2 years (0.22-18 years), with 59.8% of male and 40.2% of female. There are still some differences between French repartition of data recording, with 53 inscriptions in Parisian multidisciplinary staff, 3 in the North, East 4, West 61, South West 38 and South East 39, with big differences between French centers. Majority diagnosis was Osteosarcoma (26.4%) and Ewing sarcoma (25%). Other diagnoses were benign tumors, aneurysmal bone cysts, and chondrosarcomas. Bone lesions were mostly localized in lower limbs for 119 patients (58.6%), upper limbs for 32 patients (15.6%), pelvis for 27 patients (13.2%), facial (n=11), spine (n=8), thoracic (n=6). Patients were mostly presented in multidisciplinary sarcomas staff before the beginning of the treatment: 31.9% before biopsy, 29.4% before surgery, and 21.5% before decision of neoadjuvant chemotherapy. No biopsy was done before treatment for 25.5% of pediatric patients. Among available information regarding the technic of biopsy (n= 124), there was surgical biopsy in 62.9%, and fine needle micro biopsy in 27.1%. All these data represent the majority of the French bone pediatric sarcomas, even if number of registrations in some centers could be improved. Strength of this network is that all the patients have been discussed in specialized multidisciplinary staff. Our experience demonstrates that it is feasible to use national registers to collect information about sarcoma whatever the age of patients and to increase the knowledge of epidemiology for this rare and disparate entity.

Keywords : sarcoma, bone, paediatric, network, resos
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PALLIATIVE SURGICAL TREATMENT OF BONE METASTASES: IS THE CURRENT PRACTICE CORRESPONDING TO GOALS?

Abstract ID : 1310
Submitted by : Vania Oliveira the 2016-02-14 23:45:22
Category : Others
Typology : Poster
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Purpose
Bone metastases are associated with a poor prognosis and predispose to pathological fracture. Palliative surgical treatment aimed to relieve pain and provide stability. Endoprosthetic reconstruction presents better functional outcome than internal fixation. However, the main selection criterion is a relatively long expected survival, when the benefits of a durable and stable implant outweigh surgical risks, rehabilitation time, and high costs.
This study aims to evaluate the current bone metastases surgical approach over a 5-year period in relation to patient survival.

Methods
Sixty-five patients with 73 treated lesions were retrospectively evaluated. Parameters concerning patient and tumour characteristics, and surgical, functional and oncological outcomes were analysed. Survival rates were calculated employing Kaplan-Meier.

Results
There were 57 pathological and 16 imminent fractures treated. Follow-up was 35.4 months (range 0-87). The most common location was total femur 67.1%. Most frequently, patients were treated with internal fixation (78%). Total hip replacement was performed in 15%.
During the first 20 months 40% of patients died and the one-year estimated survival was 77%.

Conclusions
This study allows better understanding of these patients response to the current surgical treatment. Most frequently treated metastases located at femur, with higher functional impairment. Surgical complications (infectious or haemorrhagic) and fast growing primary tumors are associated to early death. Despite this, these patients' survival justifies clinical investment. Additionally quality of life scores are necessary to evaluate more accurate the cost-effectiveness. The current surgical treatment of bone metastases is very important for these patients but it seems not to modify the prognosis. Surgeons should dedicate to improve and optimize it.

Keywords : bone metastases, pathological fracture, surgical treatment, femur, infection, survival
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Para-Articular Extraskeletal Osteochondroma of the Infrapatellar Fat Pad

Abstract ID : 1292
Submitted by : Engin Ilker Cicek the 2016-02-14 16:54:34
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Osteochondromas are very common benign tumors. They are contiguous with the medullary cavity and composed of cartilage and bone. Extraskeletal osteochondromas, unlike typical osteochondromas, are not contiguous with bone. They usually spring from the synovial tissue and tendon sheaths. Extraskeletal osteochondromas have been rarely reported to occur in the knee and hip. Para-articular extraskeletal osteochondromas of the infrapatellar fat pad have a benign clinical history regardless of whether they are managed by arthroscopic or open marginal excision.

Case:
We present the case of a 30-year-old male who had a slow-growing mass of 2 years' duration, located in his lateral compartment of his knee The mass was slowly becoming more palpable anteriorly from fibular head. The increase in size and progression of pain and discomfort during ambulation make him attend to our clinic. Imaging studies revealed an ossified mass bearing no connection to any other structure in the lateral side of the knee joint. An excision biopsy was performed,. although larger than its usual plain radiological presentation, the mass was easily dissected from the parapatellar longitudinal arthrotomy and underwent marginal excision with no complications and no recurrence. Knee continuous passive motion (CPM) machine was initiated for early knee motion from the first postoperative day.

Discussion:
They are slow-growing, benign, osseous tumors, and are often misdiagnosed as conventional osteochondromas or synovial chondromatosis. extraskeletal osteochondromas are rare, their typic localizations are the digits of the hands or feet and rarely foot, knee and hip1. Extraskeletal osteochondromas differs from snovial chondromatosis by the well-defined osseous mass occurs in the soft tissue.

Keywords : osteochondroma, extraskeletal, fat pad, para articular
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PATIENT-SPECIFIC 3D-PRINTED REGISTRATION AND CUTTING GUIDES FOR HEMICORTICAL RESECTION AND RECONSTRUCTION OF METAPHYSEAL TUMORS AROUND THE KNEE

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Submitted by : Facundo Segura the 2015-10-20 18:51:22
Category : Others
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INTRODUCTION
Some benign aggressive tumors and low grade malignant tumors can be resected with close margins without compromising the patient s oncological evolution.
When these tumors are located in the distal femur or proximal tibia, they compromise the knee joint.
Hemi cortical resection, instead of intercalary or osteoarticular allows to save the articular surfaces, the bone stock and the opposite cortical continuity.
Intra-surgical navigation has improved precision of the cuts performed in a tridimensional space. In this paper, we explore the combined use of Surgical Navigation with 3D-printed registration and cutting guides
The objective of this paper is to report the use of surgical navigation, registration and cutting guides for hemi cortical marginal resection and allograft reconstruction of metaphyseal tumors around the knee.
MATERIAL AND METHODS MATERIAL
3 patients were treated during the study, 2 presenting parosteal osteosarcoma in the distal femur and 1 presenting a peripheral chondrosarcoma in the proximal tibia.
The patients presenting parosteal osteosarcoma were females aged 18 and 29 years old and the patient with peripheral chondrosarcoma was a 24-year-old male.
CT and MRI images were fused and processed and 3D-models were created. They served as a basis for the virtual simulation of the surgery, which was performed in the Mimics Innovation Suite (Materialise NV). Once the simulation was satisfactory, the results were used to digitally compare and select the optimal allograft. After this, two guides were designed and 3D-printed: a patient- specific and an allograft-specific registration and cutting guide. The cutting planes derived from the planning, as well as the CT and MRI images were loaded into a Stryker Intellect Computer- Assisted Surgical Navigation System.
The registration and cutting guides were fully matched with the coordinate system and landmark points generated inside the Navigation System s software.
METHOD
In all the cases a virtual planning was performed through CT and MRI images fusion and 3D modelling of the lesion.
The guides were designed based on the virtual planning giving the possibility to cut 5 mm and 10 mm away from the tumor margin. Prior to the surgery, 3D printed biomodels were used to physically perform the surgery on them. That allowed to check the performance of the guides regarding margins accuracy and integration with the Surgical Navigation System.
The tumor is reached by a conventional approach. Once the guide is properly positioned, five (5) landmarks are touched with a smart pointer in order to match specially the Navigation System s reference frame with the bone reference frame. Once this was performed, it was possible to navigate the femur or the tibia and locate the resection planes. The jigs contain, grooves located so as to guide the blade along the resection planes.
After the tumor resection, the same procedure was repeated in the allograft. The reconstruction was made with the allograft, stabilized by means of conventional plates and screws.
RESULTS
In the three cases the margin was free of tumor, both at macro and microscopic level and never less than 1 mm, according to the original plan.
There were no postoperative complications registered and the patients were allowed to walk with full load in the treated limb 4 months after the procedure.
At the assessment time every graft showed integrated and the functional MSTS score average was 28.
DISCUSSION
The current challenge in bone tumor surgery is to resect the least amount of tissue of the host in order to preserve the maximum function possible.
In some tumors marginal resection is a good option without compromising the oncological evolution.
In low grade malignancies near the knee is possible the resection of only one cortex, preserving the articular cartilage, bone stock and the continuity of the opposite cortex.
The use of navigation in this situation has allowed planned bone cuts with better precision. The medical images and 3D reconstruction models allow the surgeon to do cuts according to what was previously planned.
In hemicortical resections the use of cutting guides allows a resection according to the planning with a precision of 1mm. In addition the guides allow a more exact matching when the reconstruction is made with allograft bone.
CONCLUSIONS
The use of Patient-Specific Custom-Made cutting guides in tumor resection and allograft reconstruction around the knee allows marginal resections, with optimal morphological matching between the allograft and host bone.

Keywords :
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Supplementary material : http://sites.altilab.com/files/122/abstracts/patients-specific-3d-guide.docx, http://sites.altilab.com/
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Pediatric primary pleural myoepithelioma: a case report.

Abstract ID : 1489
Submitted by : Michele Boffano the 2016-02-22 21:40:40
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Myoepithelial tumors represent a diverse morphological and biological spectrum of tumors, composed of epithelial and mesenchymal elements. These tumors are more commonly encountered in salivary glands or skin, but can also be found in the upper airway, lung, gastrointestinal tract, breast, soft tissue and other unusual sites. Malignant myoepithelioma is an extremely rare disease and very few pediatric cases have been reported. These tumors are described with a considerable amount of local recurrence (30%), a unique distant recurrence is less frequent especially in the lung.
This case report describes a malignant myoepithelioma of the pleura in a 12-year-old boy who relapsed with pulmonary metastasis following a large surgical resection.
Case Report:
A healthy 12-year-old boy presented with two month history of right chest wall pain and swelling after a traumatic event. A magnetic resonance scan showed a multilobulated lesion (4x5x4.2 cm) encasing the right 10th rib with osteolytic imagines, the primary lesion was expanding into the spinae muscles and there was evidence of slight perilesional fluid between the parietal pleura and the chest wall. An open biopsy was perfomed and histology indicated nodular fasciitis. A radiological and clinical control after 45 days showed a local progression, a new open biopsy was carried out. Hystological analysis, discussed with national and international coordinators for soft tissue sarcoma, described a presence of spindle cells with mild cytologic atypia positive for smooth muscle actin and desmin at immunochemistry. The molecular biology was negative for ETV6 gene rearrangement. The lesion was thus classified as an atypical myofibroblastic tumor. Due to this descriptive histological report and local progressive disease, the patient underwent a wide local excision with a surgical chest wall reconstruction without acute sequelae. The histology examination showed a pleural primary malignant myoepithelioma, with tumor free margins. The patient then started a radiological follow up with chest CT scans every 3 months. After 18 months the scan showed a right pulmonary nodule and a pulmonary metastasectomy was performed. The histological diagnosis was pulmonary myoepithelioma metastasis. At present, 14 months after the last surgery, the patient is alive and there is no evidence of any residual disease.
Conclusions:
Primary pleural myoepithelioma are very rare; histopathological recognition of these tumors is essential. A multidisciplinary team and a multimodal approach is the only strategy against rare diseases in pediatric oncology.

Keywords : myoepithelioma, pediatric sarcoma, multimodal therapy, pleural tumours
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Pelvic Ring Tumors. Resection and Reconstruction.

Abstract ID : 1418
Submitted by : João Esteves the 2016-02-21 20:09:50
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Primary and secondary malignant tumors as well as aggressive benign tumors are relatively common in the pelvic ring. The region II (acetabulum) is the most common, followed by the region I (iliac) and III (rami). The sacrectomy, interfering with the stability of the pelvic ring, needs, most times, some sort of reconstruction. Reconstruction options have evolved but are still a challenge in the pre, intra and post-operative periods.

Materials and Methods
Twenty-five patients underwent pelvic/sacral surgery from 2000 till 2015 in our department. The most common diagnostics were condrosarcoma (n=8), cordoma (n=5), giant cell tumor (n=4), osteosarcoma (n=2) and metastases (n=2). We also had one case of Ewing sarcoma, peripheral nerve sheath sarcoma, condroblastoma and schwannoma. In the tumors in the zone I (n=6), there was the need for reconstruction with allograft or autograft in 3 cases. In the zone II (n=3) we treated the lesions with aggressive curettage. We didn't need any reconstruction options for the zone III lesions. There was one osteosarcoma involving both the zone I and II, and the patient underwent radical resection and reconstruction with and iliofemoral arthrodesis. There were 5 lesions involving both the zones II and III, and 2 underwent reconstruction with total hip replacement anchored on the remaining ilium. There was one giant cell tumor that invaded both the zone I and IV and was treated with aggressive curettage. The sacrum, zone IV, was the most involved zone, with 7 cases, in which 3 underwent total sacrectomy with illiolumbar reconstruction.

Results
There were 7 curettages and 18 ressections, 13 with wide margins, 3 marginal and 2 intralesional.
There were 4 infections, all in the sacrectomy patients, 2 resolved and 2 became chronic. Also neurologic sequels were presented in the 3 total sacrectomy patients.
One of the pelvic reconstruction failed and there was the need for revision.
The relapses occurred in 4 condrosarcomas, 3 of which evolved with lung metastases and death, and 1 had the need for pelvic amputation, and the patient is still alive.
There were 3 relapses among the cordomas, and all eventually led to death. Both cases of osteosarcoma evolved with metastases and death.
The functional score (American Musculoskeletal Tumor Society) of the patients that survived is, in average, 79% in the 9 patients who underwent some form of resection and 94% in the 8 that underwent aggressive curettage.

Discussion/Conclusion
Pelvic resections carry a high risk of complications. However the challenge for the limb preservation is worth if we take into account the very good functional outcome of the surviving patients. When it is surgically feasible, the histology allows it and the adjuvants are predictably effective, some less invasive surgical treatment should be chosen to try to reduce the morbidity of the procedure.

Keywords :
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Percutaneous minimally invasive spinal surgery with pedicle screws for the treatment of bone metastases involving the thoracolumbar spine: a cross-sectional study

Abstract ID : 1193
Submitted by : Rafael Oliveira the 2016-02-11 02:17:26
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Study design: Cross-sectional study.
Objective: To evaluate clinical results of minimally-invasive surgical fixation, with or without decompressive procedure, in patients with bone metastases in the spine.
Summary of background data: The spine is the main site of bone metastases, which cause significant morbidity due to spinal cord compression, leading to instability, pain and difficulty walking. Minimally invasive spine surgery (MISS) has been increasingly used in trauma cases, and could be beneficial in cancer cases too.
Methods: Medical records of all patients undergoing MISS for bone metastases were reviewed. Pain, clinical status, performance status, surgery time, use of transfusion and hemoglobin levels, and hospital admission times were evaluated.
Results: Fifteen patients were operated during the study period, most due to metastases of breast or kidney cancer. Most had limited performance status (ECOG > 2) and neurological deficits (Frankel D or C), with expected survival of less than one year. No conversion to open surgery was needed, and there was no case of foramen invasion. The mean surgery time was 154 minutes, higher for cases needing decompression. Four of the five patients needing decompression surgery also needed a blood transfusion. There was one case of wound dehiscence, and one of postoperative infection. Most patients had low or no pain.
Conclusions: In patients with spinal bone metastases, MISS causes low tissue lesions, with good results and short surgery times, allowing patients to undergo primary disease treatments (chemo or radiotherapy) earlier.

Keywords : Spine, Bone Neoplasm, Neoplasm metastasis, Minimally invasive surgical procedures
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Supplementary material : http://sites.altilab.com/files/122/abstracts/mis-enviado-para-emsos-2016.pdf, http://sites.altilab.com/files/122/abstracts/mis-enviado-para-emsos-2016.3.pdf
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Percutaneous trepanbiopsy in the differential diagnosis of destructive lesions of spine.

Abstract ID : 1317
Submitted by : Khurshidjon Abdikarimov the 2016-02-15 14:11:29
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction : To determine the effectiveness of trepanobiopsy in morphological verification of destructive lesions of the spine.
Material and methods: For morphological verification 26 patients with destructive changes of the spine underwent percutaneous biopsy of spine. Manipulation carried out under the three projection X-ray control, with a standard needle for vertebroplasty with minor rework tip of the needle to improve the capture of biopsy. Of the 26 patients, 19 had multiple spinal lesions, 7- isolated lesions of the body of the spine. 12 patients underwent trephine biopsy of the thoracic spine, 10 - the lumbar and 4 - from the sacrum.
Results. Of the 26 patients in 6 oncological pathology no revealed. The nonspecific spondylitis was on the background of inflammation in 1, osteoporosis of unknown etiology in 2 and TB lesion in 3 patients. Oncologic pathology diagnosed in 20 patients. Histologically: 3 patients had multiple myeloma (plasmacytoma), 11 - metastatic adenocarcinoma, 3 - giant cell tumor, 2 - reticulosarcoma and 2 patients - lymphoma.
Further, the patients with non-cancer pathology were referred to other specialized medical institutions. Patients with malignant lesions depending on the histological variant of spinal lesions were performed decompression-stabilizing surgery, percutaneous vertebroplasty with medical cement, chemotherapy and radiotherapy.
Conclusion. Thus, minimally invasive technique of percutaneous spinal trepanobiopsy is a compulsory surgical diagnostic manipulation in destructive changes of the spine. Histological examination of the biopsy allows for morphological verification of the diagnosis, the result of which predetermines the further examination and treatment of the patient.

Keywords : destructive lesions of spine, Percutaneous trepanbiopsy
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Phase I study of daily oral rapamycin and every two weeks intra-venous irinotecan (RAPIRI I) in children with a relapsed or refractory malignant solid tumor: good tolerance and potential activity in sarcomas - a report from the Société Française des Cancers et leucémies de l'Enfant et de l'adolescent (SFCE).

Abstract ID : 1221
Submitted by : NATACHA ENTZ-WERLE the 2016-02-12 01:16:15
Category : Targeted Therapy
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Intra-tumor hypoxia is a factor of poor prognosis in several pediatric solid tumors and induces aberrant microvasculature. Rapamycin, a mTor inhibitor, associated with Irinotecan, a topoisomerase I inhibitor, inhibits angiogenesis and induces apopotosis. A phase I pharmacokinetic and pharmacodynamic study with irinotecan combined to rapamycin was performed in children with relapsed/refractory solid tumors.
Patients and Methods: Eligible children aged from 1 to 21 with relapsed/refractory solid tumors were enrolled using a 3+3 design to determine the maximum dose tolerated (MTD) / dose-limiting toxicity (DLT) of rapamycin and irinotecan combined therapy. Rapamycin was administered once daily in 28-day cycles associated with irinotecan intra-venous infusion at Day 1 and Day 15. Dose escalation schedule included 10 levels combining rapamycin from 1 to 2.5 mg/m2 and irinotecan from 125 to 240 mg/m2. Toxicities, pharmacokinetics, pharmacodynamics and UGT1A1 polymorphism were characterized. Response evaluation was performed at 2 cycles.
Results: Forty-two patients were treated. One patient over six patients experienced DLT at 3 different levels. Dose escalation was achieved at level 10. Most toxicities were mild to moderate. Grade 3 and 4 adverse events were observed from level 2 and were reversible. No range frame can be determined for irinotecan and/or rapamycin based only on PK analyses. UGT1A1 polymorphism was not associated with severe toxicities. Thirty-one patients were assessable for tumor responses. Tumor response occurred from level 2. Six osteosarcomas and three Ewing sarcomas were enrolled. Three patients' tumors were not evaluable. Two out of 6 evaluable patients were in partial response and one in stable disease. All those patients were having previously 3 prior lines of therapy.
Conclusion: The combination of oral daily rapamycin and irinotecan has acceptable toxicity. The anti-tumor effect was present in the population of bone sarcomas. As no MTD was established and based on the combined analyses of toxicities and pharmacokinetics, we might suggest a recommended dose of 125mg/m2 for irinotecan and 1.5mg/m2 for rapamycin with minimal PK follow-up for phase II trial.

Keywords : targeted therapy / phase I / sarcomas
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Pigmented Villonodular Synovitis (Giant-Cell Tumor of Tendon Sheath) results of surgical and adjuvant therapy

Abstract ID : 1133
Submitted by : Hans Roland Dürr the 2016-02-05 06:21:26
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Pigmented Villonodular Synovitis (PVS) is a rare proliferative lesion of the synovium, affecting mainly younger patients. The standard therapy is resection or synovectomy. Local recurrence is common. Aim of this study is to describe symptoms, surgery and the impact of adjuvant therapy on outcome in a single centre study.

Patients and methods
Between 1996-2014 114 resections in 97 patients had been done. The mean age of 64 women and 59 men was 39,9 years (13-77 years). The most common site was the knee in 60 cases, followed by the foot in 17, hand in 13 and ankle in 9 cases. Each 4 cases were located in the elbow and hip joint, individual cases in other sites. 62 cases had a diffuse, 52 cases a nodular lesion. The mean follow-up time was 68,7 months (13 – 238 months).

Results
The symptoms were pain in 54%, swelling in 40%, effusion in 12%, restriction of movement in 3% and findings by follow-up in 22 %. 24 cases (21%) developed local recurrence. Of the 97 patients currently 92 are free of recurrence (94.8%). For that 78 of these patients needed 1 surgery, 11 2 surgeries, 2 3 surgeries and one patient had 5 surgeries. 5 patients currently have a relapse and have so far received no further surgery/therapy. Despite 2 recurrences all occurred in the first 3 years (Fig. 1). Diffuse forms showed a significantly increased recurrence rate (Fig. 2), (27% vs 13%). In 28 cases we performed adjuvant radiosynoviorthesis, 24 of them at the knee joint. In a total of 33 cases with diffuse knee involvement RSO was performed in 24 cases. The risk of local recurrence with RSO was 25%, without RSO 33% (n.s.).

Summary
Overall, the treatment of nodular PVS shows a good result, if recurrences occurred, then preferably at tendon regions as in hand or foot. The diffuse form had with 27% a significantly increased risk of recurrence. RSO decreased that risk (studied at the knee), but this was not significant. A low dose percutaneous radiotherapy was performed only in one case achieving stable disease over years. In 95% of the cases local recurrence was not evident at follow up, but that needed up to 5 surgeries.

Keywords : Pigmented villonodular synovitis, gient cell tumour of tendon sheath, radiosynoviorthesis, therapy, prognosis
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Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1.jpg, http://sites.altilab.com/
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PIGMENTED VILONODULAR SYNOVITIS: LITERATURE REVIEW

Abstract ID : 1341
Submitted by : Esdras Furtado the 2016-02-16 01:36:54
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION : The pigmented vilonodular synovitis (SNVP) was first described by Chassaignac, in 1852. Is uncommon clinical entity, with an incidence of 1.8 cases per million inhabitants per year. Affects any age group, being more frequent between the third and fourth decades of life. Discreet predominance in females. In the form, the knee joint is the most involved, 80% of the cases. Other joints with frequent involvement are the hip (15%) and ankle (tarsal 5%), prevailing monoarticular involvement. Idiopathic theory remains the most accepted. New cytogenetic studies suggest an association between the presence of trisomy 7 and the development of this pathology.
MATERIAL AND METHODS: extensive literature review was conducted, based on PUBMED databases and SCIELO. Where the relevant works were selected. Three distinct clinical forms have been reported: diffuse form; located; and mixed, described by Yogamardiansyah et al., the increase in volume is also a signal present in 24% of patients cited by Asik et al., 34% of cited by Visser et al., 40% in series of Muscolo et al. and up to 64% on work by Kim et al. Due to the difficulties of conducting a clinical diagnosis conclusive, additional tests and histology are needed. In 85% of cases, the radiographic studies are normal. Magnetic resonance imaging (MRI) is the best method. The characteristic image of hemosiderin within the synovium is heterogeneous volume increase of soft tissue, well-circumscribed, with low signal on T1 and T2 weighted sequences due to the ParaMagnetic effect of synovium, which can be increased by using if-echo gradient sequences, is the best method. The histological examination sets the diagnosis. The name "pigmented" comes from the macroscopic presence of hemosiderin intra-and extra-articular. Lesion resection is the treatment recommended. In his involvement in the knee, Arthroscopic by multiple portals is the treatment of choice. Other less frequent treatments are the partial synovectomy, Synovectomy open more radiation and Chemical Synovectomy by injection of yttrium 90. In cases of recurrence, a new sinovectomia, followed by radiation therapy in cases of persistent injury. Evolution with joint destruction after inadequate treatment can be treated with Arthroplasty or atrodesis.
Results: With relapse in localized form less than 5%; However, in the diffuse form, the rate is between 8 and 48% of cases. This high rate is attributed to permanency of the injury, especially in the aft compartment, after via open Synovectomy. Patients not treated properly can evolve to joint destruction.
Conclusion: This is a benign lesion and rare, with variable spectrum of extra-articular involvement and articulate, and the knee the most affected. Characterised by the deposition of hemosiderin and which can lead to serious joint sequelae, when diagnosed late or treated incorrectly.

Keywords : Pigmented, Vilonodular, Sinovits
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POLYOSTOTIC ANEURYSMAL BONE CYSTS.

Abstract ID : 1383
Submitted by : LAURA TRULLOLS the 2016-02-19 16:34:32
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Primary Aneurysmal Bone Cyst (ABC) is characterized by the presence of spongy or multi-cameral cystic tissue filled with blood. The process is a benign bone tumor, monostotic, that commonly affects children, but it is locally destructive and has a high propensity for recurrence.
We present the fifth case described in the literature of multiple metachronous primary ABCs as a rare variant of ABC.

CLINICAL CASE
21-year-old boy affected from metachronous multiple primary ABCs involving four different sites (left proximal humerus, medial third of left clavicle, left iliac bone, left proximal femur).
When he was 15y.o. he suffered from an ABC pathological fracture in left proximal femur that required cement filling and bone osteosynthesis. On the ABC in left iliac bone, the treatment applied was embolization. At the age of 21, he was treated conservatively of a pathological fracture of ABC in left clavicle. The ABC in left proximal humerus is going to be treated with embolization proceeding.

CONCLUSIONS
Polyostotic (also known as metachronous) ABC are extremely rare in literature. In contrast to solitary ABC, the multiple lesions have been found more frequently in male individuals. The treatment applied is the same as a single presentation.

Keywords : Polyostotic, Aneurismal Bone Cyst
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Polypropylene mesh for hip capsule reconstruction – Reduction of dislocation in proximal femur prosthesis – At what cost?

Abstract ID : 1097
Submitted by : Ajay Puri the 2016-01-29 08:35:20
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
The aim of the study was to determine the effectiveness of polypropylene mesh in reducing incidence of hip dislocation when used to reconstruct the hip capsule after the proximal femur resection and its influence on surgical site infection.
Material and method:
A retrospective analysis of a prospectively maintained sarcoma database identified 112 patients with a proximal femoral replacement after oncologic resection between January 2006 to May 2014. 79 patients (Group A) had adequate native capsular tissue after tumor resection and did not require any additional capsular augmentation while 33 patients (Group B) needed a polypropylene mesh to reconstruct the hip capsule due to inadequate capsule after tumor resection. Rate of dislocation and surgical site infection were analysed at a follow up of 1 year.
Result:
101 patients were available for final analysis. Overall dislocation rate in our study was 3 %(3 out of 101). Group A had 4 % (3 out of 70) dislocation rate compared to 0% (0 out of 31) in Group B (p-0.551). Overall infection rate was 14 % (14 out of 101). 10% (7 out of 70) of Group A had infection compared to 23% (7 out of 31) in Group B (p – 0.120).
Conclusion:
Polypropylene mesh serves as an inexpensive readily available material to reconstruct the hip joint which offers immediate and long term stability in inherently unstable hips. The mesh seems to favour an apparent increased risk of infection (which did not reach statistical significance in our study).

Keywords :
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Postradiation Sarcoma in the Amputation Stump of Treated Ewing Sarcoma

Abstract ID : 1497
Submitted by : Baris Gorgun the 2016-02-22 22:48:34
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION:
Postradiation sarcomas (PRS) are aggressive sarcomas which are developed years after radiation therapy (RT) for sarcoma treatment. It has a poor prognosis with its high local recurrence and metastasis rates. The incidence is below %1 of all sarcomas and it can be seen between 4 and 55 years after (the mean latency period is 10-15 years) irradiation. Patients with PRS have a survival between 12-23 months and the 5-year survival is found between %11 and %29 in the literature.

The etiopathology has not been clearly identified yet; but there are evidences of its relationship with breast cancer, lymphoma and bone and soft tissue sarcomas. It has subtypes histologically such as angiosarcoma, leiomyosarcoma, fibrosarcoma, chondrosarcoma and osteosarcoma. Diagnostic criterias of PRS are: development in a previously irradiated field, histological discrimination of the new lesion from the initial lesion and a latency period of 3-5 years.

In this case report, a 39 year-old woman diagnosed with Ewing sarcoma in the right tibia and undergone amputation surgery, who developed postradiation sarcoma in the irradiated field after 18 years of latency, will be presented.

CASE:

39 year-old woman with a history of Ewing sarcoma in right tibia and undergone excision surgery 23 years before was examined in our clinic. She had a 40 seance adjuvant radiotherapy combined with chemotherapy. 5 years after the surgery she had developed a fistula in the incision field with a drainage, which was diagnosed as osteomyelitis or the recurrence of sarcoma. It was treated with transtibial amputation. There had been no evidence of infection in the histopathologic and microbiologic examination of samples gained intraoperatively. After the amputation surgery, she had no complaint until 3 years before. She has pain in the amputation site of right proximal tibia for 3 years.

RESULTS:

In magnetic resonance imaging, a new lesion with malign characteristics was detected. An increased activation in the amputation site was identified in PET/CT. Infection markers were negative. Incisional biopsy was performed for the diagnosis and it was “postradiation sarcoma with myoid differentiation (including bundle cells, partially pleomorphic sarcoma).
After the histopathologic diagnosis, transfemoral amputation was planned.

CONCLUSION:

Postradiation sarcomas (PRS) are rarely seen aggressive sarcomas with a poorer prognosis compared with other sarcomas. It can develop in the irradiation field of patients treated with radiotherapy for any tumour. It can stay latent for years; but when they are detected, one must know that being high-staged, they have a high rate of local recurrence and metastasis. PRS incidence is between %0,03 and %0,8 between all irradiated patients. A newly expressed pain with a history of any sarcoma must be accepted as recurrence until it has been ruled out. Other tumours for differential diagnosis like giant cell bone tumour, aneurysmal bone cysts or Brown tumour’s should be investigated. Infective processes must be ruled out as well. But, “if the patient has an irradiation history, one should exactly keep postradiation sarcomas in mind, which are seen less common, but more lethal.”

Keywords : postradiation sarcoma, radiotherapy complications, irradiation sarcoma, ewing sarcoma
Authors :
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Preliminary results of Highly Injectable Bi-Phasic Bone Substitute (CERAMENT) in the treatment of benign bone tumors.

Abstract ID : 1176
Submitted by : Daniel Kotrych the 2016-02-10 00:00:32
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Benign bony lesions that are symptomatic, grow rapidly or are radiologically unclear, must be biopsied. After histological investigation an appropriate therapy is initiated. Intralesional curettage and the void reconstruction is the treatment of choice. Various options of bone defect filling have been reported including cancellous bone autograft as a gold standard. This modality has many desirable graft properties. However autogenous bone grafting has some restrictions, such as donor site morbidity, the limited availability of grafts of sufficient size and shape, and additional procedures for harvesting. Complication rates of 20% have been reported. Similarly, allografts have a high complication rate.CERAMENTTM|BONE VOID FILLER is an injectable and moldable ceramic bone substitute material intended for bone voids. The material consists of a powder and a liquid component. The major constituents of the powder are hydroxyapatite and calcium sulfate hemihydrate.Thirty three patients hospitalized at the Department of Orthopedics, Traumatology and Orthopedic Oncology of Pomeranian Medical University in Szczecin, Poland, were enrolled to our study between June 2013 and October 2014. Totally, we treated 24 women and 9 men with a median age of 47 years (range: 22-74). All patients were suffering from musculoskeletal system conditions (enchondroma 63,6%, giant cell tumor 18%, aneurysmal bone cyst 9%, fibrous dysplasia 9%, Gaucher disease 3%). They required curettage of pathological lesion and administration of bone substitute. The diagnosis was established by biopsy and X-ray picture. The lesions were localized in proximal part of the tibia (18%), calcaneus (18%), proximal part of humerus (18%), distal part of femur (8%), proximal part of femur (8%), II metacarpal (9%), talus (9%) and distal part of the tibia (9%).CT scans and X-rays were carried out post-procedure to assess bone remodeling, intra- osseous CERAMENT distribution and any signs of its leakage. Clinical outcome was to quantify using VAS score (0–10) and the musculoskeletal tumor society (MSTS) scoring system (0-35), and were performed before the operation as well as 1 month and mean of 13 months of observation after the procedure. Obtained data were compared using paired samples t-test at baseline as well as during follow-up. Statistical significance was accepted as significant at $p < 0,05$.The results of our study report that CERAMENT can be successfully used as a bone substitute in patients with various bone diseases, as well as bone tumors. CERAMENT can provide an effective and long-term solution for reconstructive procedures following curettage of bone tumors. CERAMENT administration is easy to use, safe and well tolerated by patients. It significantly reduces recovery time and improves quality of life. Although the study is still ongoing, new bone formation was clearly demonstrated in all cases with sufficiently long follow-up, with no adverse effects observed.

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Prevention of chemotherapy-induced nausea and vomiting in patients with soft tissue sarcoma.

Abstract ID : 1180
Submitted by : Taketoshi Yasuda the 2016-02-10 12:02:34
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: A therapeutic principle of soft part sarcoma (STS) is a radical operation. However, chemotherapy (CT) is performed in the cases with metastasis and large tumor. In CT for STS, regimens to give a multiple drug day after day are used frequently. Almost anticancer agents are classified in moderate or high emetogenic agents. The purpose of this study is to evaluate the efficacy of 5-hydroxytryptamine receptor antagonists (granisetron and palonosetron) and neurokinin-1 receptor antagonists (aprepitant) in preventing CT-induced nausea and vomiting (CINV) in patients with STS.
Methods: The subjects were 23 cases who were undergone CT for spindle cell STS. There were 13 males and 10 females, with an average age of 67.0 years (range, 36–86 years). CT was performed 95 cycles and the regimens were as follows; MAID (Mesna+Doxorubicin+Ifosfamide+Dacarbazine) in 63 cycles, AI (Doxorubicin+Ifosfamide) in 17 cycles, and AC (Doxorubicin+Cisplatin) in 10 cycles, and ICE (Ifosfamide+Carboplatin+Etoposide) in 5 cycles. It was classified in 3 groups by the kind of given anti-CINV drugs; Group A was administrated only granisetron (8 cases, 42 cycles), Group B was administrated granisetron and aprepitant (9 cases, 26 cycles), and Group C was administrated palonosetron and aprepitant (6 cases 27 cycles). There was no significant difference about histopathological diagnosis, regimens and patient's profile in each group. We evaluated the grade of nausea and vomiting, the duration of nausea and vomiting, the ratio of complete response (CR) in compared with each group. The grade of nausea and vomiting was evaluated according to the National Cancer Institute CTCAE version 4.0. CR was defined when the there was no nausea and no administration of relief drugs. It was evaluated at both acute stage (CT after 0-24 hours) and late stage (CT after 24-120 hours). Data were presented as the mean value ± standard deviation.
Results: In all cycles, grade of nausea was grade 1 in 45 cycles, 2 in 36 cycles and 3 in 14 cycles. Grade of vomiting was grade 1 in 75 cycles, 2 in 19 cycles and 3 in 1 cycles. The average duration of nausea was 2.7±1.9 days. In each group, Group A was 2.7±1.9, Group B was 1.8±0.6, Group C was 1.6±0.3, respectively. Group B and Group C were significantly more effective than Group A in preventing nausea. About vomiting, there was not significant difference of grade and duration in each group. Three cases of 8 (38%) in Group A refused CT continuation for CINV. In order of all period, acute stage and late stage, CR was 70%, 92% and 71% in Group A, 68%, 94% and 69% in Group B, and 58%, 83%, and 52% in Group C, respectively. Both Group B and Group C were significantly shorter than Group A in length of hospital stay.
Conclusions: Combination with granisetron/palonosetron and aprepitant was significantly more effective than only granisetron to prevent CINV. Control of CINV was useful in improving patient's continued acceptance of CT for STS.

Keywords :
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Primary Aneurysmal Bone Cyst of Patella: A Case Report

Abstract ID : 1282
Submitted by : Cagri NEYISCI the 2016-02-14 15:05:03
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Aneurysmal bone cysts represent less than 1% of all bone tumors with tendency to develop in metaphysis. In this study, we aimed to report an unusual region for primary aneurysmal bone cyst.
Materials and Methods: A 20-year-old male patient presented with moderate knee pain. He suffered direct trauma to his knee six months ago. There were no local tenderness and swelling. Knee range of motion was normal. Plain radiographs revealed an osteolytic lesion at the patella and CT study was performed for further evaluating. Tru-cut biopsy was performed and reported as aneurysmal bone cyst. For definitive surgery, intralesional curettage via anterior approach and additional cauterization with phenol and alcohol was performed. Grafting with allogenic corticocancellous bone was applied to fill the cavity. He fully recovered surgery with no complications. At postoperative 3rd month he had no complaints and gained full knee ROM.
Results: Bone tumors of patella are rare and mostly are chondroblastoma, giant cell tumor, solitary or aneurysmal bone cyst. Generally, they are benign and giant cell tumor is the most frequent one. Primary aneurysmal cysts are rare and usually seen at young females. They are often associated with trauma.
Conclusion: According to Enneking classification our patient had Stage II lesion. Thorough curettage, cauterization with phenol and alcohol followed by allogenic bone grafting is a successful treatment protocol for this type of lesions.

Keywords : Primary Aneurysmal Bone Cyst, Patella, Bone Tumor
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Primary malignant tumors of the central part of the long bones in children - the reconstruction using 3D techniques.

Abstract ID : 1495
Submitted by : Magdalena Rychlowska-Pruszynska the 2016-02-22 22:28:23
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Primary malignant tumors of the bone are usually localized in the knee and shoulder. Tumors of the central part of the bone are very rare. In the reconstruction of the central parts of the femur allogeneic bone grafts are used most often. This type of reconstruction is burdened, however, with a high risk of pathological fracture, nonunion of the transplants, and inhibition of bone growth in children, which is associated with shorter limbs.
Patients and method:
In the surgical oncology clinic of Institute of Mother and Child 5 children, 2 boys and 3 girls, average age of 12.5 years, diagnosed with of Ewing Sarcoma - 3 children, and Osteosarcoma - 2 children were treated in 2015. All children qualified for tumor resection and reconstruction of the central part of the femur. Patients were enrolled into the joint sparing expandable endoprosthesoplasty. Because of shortening of the femur by 5 cm after arthrodesis one patient was selected for replacement of implant with growing endoprosthesis. In 4 remaining patients, due to the short length of the distal part of the femur, femoral stems were printed using 3D techniques (based on a CT scan of the patient) and growing endoprosthesis - Mutars XP were implanted.
Results:
Postoperative course was uneventful. After surgery, the mobility in the joints of the hip and knee was retained.
Conclusions:
1. Due to the 3D printing technique creation of implants matching the individual patient's anatomy is possible
2. Application of 3D technique in treatment of patients with the tumors of the central bone can help spare the patients joints
3. Better matching implants reduce the risk of complications and improve efficiency of patient
4. Application of growing endoprosthesis ensures a proper growth of the limb

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Keywords : 3D printing, growing endoprosthesis, children
Authors :
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Psycho-social care in patients with neoplasia of the musculoskeletal system in follow-up

Abstract ID : 1247
Submitted by : Carmine Zoccali the 2016-02-13 14:28:14
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: The scientific community is aware of the high prevalence of psychosocial and educational needs in survivors at the end of the active medical treatments, which are often not recognized and treated with appropriate specialist interventions. This deficiency as well as having important implications on clinical outcomes and quality of life, produces it hard for an appropriate recovery of life after the cancer. It is recognized the need to integrate the psycho-social care in the follow-up. Psychosocial care should include the treatment of psychological distress, the promotion of healthy lifestyles and the management of the symptoms common to the survivors, who can respond to psychosocial interventions. In order to ensure psychosocial care to patients in follow-up, was inserted the figure of the psychologist within Sarcoma's ambulatory (for patients in follow-up), which is involved with the oncologist and orthopedic surgeon in the same setting care.
Patients and Method: A psychological counseling, the EORTC-C30 questionnaire for the assessment of Quality of Life and Distress Termometer (DT) for the assessment of psychological distress were offered to all patients of the ambulatory. The present study examines 350 patients (177 males and 173 females, range age 15-79 years), who in the last two years of follow-up had performed more than a psychological evaluation.
Results: The preliminary results of this observational study show good levels of psychological well-being, quality of life and psychological distress. In particular, the comparison between the mean values reported in the first evaluations than those of future evaluations, showing an improvement in the perception of general health, in role limitations, emotional state and social activity; the scores reported in the area of overall quality of life and physical functioning are stable.
Discussion: The scores recorded by DT show the prevalence of psychological wellbeing with levels of distress within the values of the cut-off of normality.
Conclusion: The preliminary results observed in this study suggest that psychosocial interventions promotes ensure that patients in the follow-up maintenance of a good response in terms of psychological distress and quality of life.

Keywords : Psycho-social care, sarcoma,psychological distress,psychological counseling
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Quality of Life in Patients with Osteochondromatosis

Abstract ID : 1045
Submitted by : Wonju Jeong the 2015-12-12 18:18:25
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Purpose : The purpose of this study is to help predict the prognosis of multiple osteochondromatosis patients with the investigation of social function, pain, physical function and quality of life of patients.
Materials and Methods : There are 87 cases which has been diagnosed the multiple osteochondromatosis from March 1993 to June 2014. The survey was conducted over the telephone and mail. We performed a survey in pain, daily life, school or work life assessment of RAND-36. 45 people who responded to the survey completely were enrolled. Variable factors, which is physical functioning, role limitations due to physical health, Role limitations due to emotional problems, energy/fatigue, emotional well-being, social functioning, pain, general health state were considered as elements related to quality of life. And we investigated significant factors for multiple osteochondromatosis patients, and analyzed the survey by scoring. Related factors included the age(over 18 and under 18), gender, body mass index, operation, joint deformity, the recurrence of disease, family history, the number of involved joint and the location of tumor. All statistical analyses were performed by SAS version 9.3(SAS, INC., Cary, NC, USA). P values of ≤0.05 were deemed statistically significant.
Results : The patients with a family history of multiple osteochondromatosis has a significantly decreased result of assessment, physical function , vitality life , social activities , health state. Moreover, there was a tendency of the poor influence in pain, emotional well-being, general health.
Conclusion :The results suggest that family history is the significant factor that influence and predict the quality of life. In other words, the developed patients in the household including patients with severe enough to know the rest of the family has poor prognosis. Through this study multiple osteochondromatosis is a chronic disease causing a profound impact on quality of life.

Keywords : multiple osteochondromatosis, quality of life, family history
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Quantitative Bone Mineral Changes Evaluated by DEXA after Bone Defect Reconstruction using a Biphasic Bone Graft Substitute after Intralesional Curettage in Benign Bone Tumors or Cysts

Abstract ID : 1453
Submitted by : Peter Horstmann the 2016-02-22 10:14:04
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives
Non-invasive evaluation of new bone formation and changes in mineralization after curettage is not always easy using conventional x-rays, and for more complex cases CT scans are often used. Dual energy x-ray absorptiometry (DEXA) has originally been developed for quantitative bone mineral measurements in patients with or suspected for postmenopausal osteoporosis. The DEXA technique can also be used for precise and quantitative measurements of bone mineral density (BMD) or bone mineral content (BMC) at various other skeletal sites and even measurements in the proximity of orthopedic implants can be performed. We aimed to document early changes in BMD in patients receiving bone defect reconstruction with a biphasic bone graft substitute after intralesional curettage in benign bone tumors and cysts.

Methods
We prospectively reviewed 8 consecutive patients (F/M: 3/5, mean age 40 (18-68) years) who underwent intralesional curettage of 9 benign or borderline bone tumors or cysts in the appendicular skeleton with subsequent bone defect reconstruction with a biphasic (60% calcium sulfate/ 40% calcium phosphate) bone graft substitute (CERAMENT™|BONE VOID FILLER (BVF)) or a biphasic gentamicin eluting bone graft substitute (CERAMENT™|G) at our orthopedic oncology center from July 2014 until August 2015 giving all patients a minimum of 6 months follow-up. We recorded histology, size and anatomic region of the bone lesions, choice of treatment, as well as changes in BMD in a ROI corresponding to the bone defect.

Results
The most commonly treated lesions were uni- or multicameral bone cysts (n=3) and enchondromas (n=3) with an average size of 17 (6-33) mL. The most commonly affected regions were the proximal femur (n=3), and the proximal humerus (n=2). CERAMENT™|BVF was used in 6 cases and CERAMENT™|G was used in 3 cases with an average amount of 17 (4-56) mL. The mean postoperative BMD was 2.70 g/cm2 (CI95%: 2.11-3.30), 1.44 g/cm2 (CI95%: 1.14-1.76) at 6 weeks, 1.28 g/cm2 (CI95%: 0.94-1.61) at 3 months, and 1.21 g/cm2 (CI95%: 0.84-1.58) at 6 months. In 5 cases an additional BMD measurement was made at 2 weeks with a mean BMD of 1.76 g/cm2 (CI95%: 1.25-2.28). The early decrease in BMD after 2 weeks might be caused by the release of contrast agency (Iohexol) in the CERAMENT™|BVF, why the 2 week time point was considered the best reference point for later analysis. In the 5 cases with a 2 week BMD time point, the mean decrease in BMD from 2 until 6 weeks was 22% (CI95%: 0-45%), until 3 months 29% (CI95%: 3.3-55%), and until 6 months 31% (CI95%: 4.3-58%).

Conclusion
In this small prospective series of 8 patients receiving bone defect reconstruction with a biphasic bone graft substitute (60% calcium sulfate/ 40% calcium phosphate), we found that the BMD at the defect site decreases in the first three months, probably corresponding to the resorption of calcium sulfate, without any further significant decrease from 3 to 6 months.

Keywords : DEXA, Bone Mineral Density, Benign Bone Tumors, Curettage, Bone Graft Substitute
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R1 resection for selected patients with extra-peritoneal desmoid-type fibromatosis

Abstract ID : 1273
Submitted by : Yoshihiro Nishida the 2016-02-14 10:23:45
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Since 2003, meloxicam, which is a selective COX-2 inhibitor, has been applied prospectively and consecutively as a first line treatment for desmoid-type fibromatosis in our institution. For patients resistant to meloxicam treatment, low-dose chemotherapy with methotrexate (MTX) and vinblastine (VBL) or planned simple resection (R1 status) were applied based on the location, infiltrative pattern with MRI evaluation, and CTNNB1 mutation status. The aim of this study was to clarify the clinical outcome of patients with planned simple resection (R1), and possible factors affecting the outcome.

Methods
Since 1991, 114 cases were diagnosed as desmoid-type fibromatosis arising in extra-peritoneal regions. Among them, 58 patients were prospectively treated with meloxicam (10mg/day). Ten cases with PD status for meloxicam were subjected to planned simple resection (histological surgical margin; R1). Seven patients with status of PR or SD, or without meloxicam treatment, were also subjected to planned simple resection (R1). Mutation status of CTNNB1 was determined using tumor specimens (paraffin embedded or frozen specimes) with Sanger method. Our fundamental criteria for simple resection have been; without infiltrative pattern with MRI evaluation, without 45F mutation status of CTNNB1, without location of lower extremity, and functional impairment after surgical treatment is not predicted. Among 17 cases treated with simple resection, 15 cases were followed up more than 1 year at the time of analyses, which composed this study. Local recurrence free survival (LRFS) was determined with Kaplan-Meier survival analysis and possible factors affecting local recurrence were analyzed with chi-square analysis.

Results
Mean follow-up period after surgery was 36 months. Only two of 15 cases recurred during follow-up. One was 19 years old female of abdominal wall desmoid with 45F mutation, and another was 43 year old female of lower extremity desmoid with 41A mutation. Local recurrence free survival at 5-year was 84%. All cases were histologically margin positive (R1). Mutation status of 45F (P=0.13) and lower extremity location (P=0.13) tended to correlate with recurrence. No functional impairment was observed after planned simple resection.

Conclusions
Because follow-up duration was short, and based on the small numbers of cases of the present study, definitive conclusions could not be drawn. However, this pilot study suggested that selected patients, without infiltrative pattern with MRI evaluation, without 45F mutation status of CTNNB1, without location of lower extremity, with extra-peritoneal desmoid-type fibromatosis could be treated with planned simple resection (R1 resection) without functional impairment, and could be controlled locally.

Keywords : desmoid, CTNNB1, R1 resection
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/figure.ppt, http://sites.altilab.com/
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Radial Shaft Reconstruction with Intercalary Endoprosthesis

Abstract ID : 1436
Submitted by : Joseph Ippolito the 2016-02-22 00:09:04
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background: With improvements in imaging and treatment of musculoskeletal tumors, options for reconstruction following joint-sparing diaphyseal resection include the use of autografts, allografts, distraction osteogenesis, custom implants, and segmental intercalary endoprostheses.

Purpose: The objective of this case series is to demonstrate that reconstruction of malignant tumors of the radial shaft with intercalary prosthesis may provide an option for patients with segmental bone loss.

Methods: Three consecutive patients who underwent wide resection of the radial diaphysis followed by reconstruction with a custom intercalary prosthesis between January 2010 and January 2015 were retrospectively identified. A custom intercalary prosthesis with lap joint design was used in all 3 cases. Post-operatively, range of motion, weight bearing status, and MSTS functional outcome scores were reviewed.

Results: The mean follow-up was 18 months (range, 9-25). All patients were weight bearing as tolerated at 1 week post-operatively. At most recent follow-up, patients elbow flexion and extension was at a mean arc of 137 degrees (range, 130-140), mean supination of 60 degrees (range, 30-90) and mean pronation of 70 degrees (range, 60-90) at forearm, mean palmar flexion of 80 degrees (range, 70-90) and mean dorsiflexion of 80 degrees (range, 70-90) at wrist. One patient suffered a minimally displaced periprosthetic fracture after a fall, which healed uneventfully, and resulted in reduced supination. All patients reported minimal to no pain without significant functional limitations, with mean MSTS scores of 26 (87%). At latest follow-up, no return trips to the OR were needed and no patients had infection.

Conclusion: Reconstruction with intercalary prosthesis for patients with metastatic disease to radial shaft is a viable option. All patients had satisfactory results and early return to function; none required return trips to the OR. Possible advantages compared to reconstruction with bone graft or PMMA osteosynthesis include early return to function and minimal weight bearing restrictions post-operatively.

Keywords : Intercalary Prosthesis, Forearm, Radius, Segmental Defect
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Radiofrequency Ablation in cartilage tumors

Abstract ID : 1422
Submitted by : Paul Jutte the 2016-02-21 21:51:55
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Radiofrequency Ablation of Atypical Cartilaginous Tumors in the long bones; results on MRI in 82 patients.
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Introduction
Atypical cartilaginous tumors (ACT) are usually treated by curettage. Our group developed effective Radiofrequency Ablation (RFA) algorithms in the treatment of ACT. MRI had a 79% sensitivity and 80% specificity for detecting residual tumour after RFA, as shown in our previous work. The purpose of this study was to show improved radiological results of RFA for ACT in more recent patients.
Methods
We enrolled 82 consecutive patients (24 male, 58 female, mean age 52 years (15 to 75). After inclusion, biopsy and radiofrequency ablation were performed, followed three months later by baseline MRI. The primary endpoint was the ablation result on gadolinium enhanced MRI, secondary endpoints were complications. The first 44 patients were named group 1 and the second 38 patients group 2.
Results
Our results show that sufficient ablation was obtained in 71 of 82 patients (87%). Group 2 did better with 92% as compared to group 1 with 82%. There was one fracture after ablation and no infections were found. The halo (ablated area) on MRI remains visible during follow-up (maximum FU being 6 years) and the dimensions of the halo do not change.
Conclusion
We have shown that the technique of Radiofrequency Ablation for Atypical Cartilaginous Tumors is improving with 92% good results in the most recently treated half of our series of 82 patients. RFA is capable of eradicating cartilaginous tumour cells minimal invasive with less morbidity and adequate monitoring during follow-up with MRI. RFA was made more effective using better algorithms, resulting in better local control.

Figure showing the ablation zone (halo) on MRI around a cartilage lesion in the femur after successful RFA

Keywords : Radiofrequency Ablation, Cartilage tumor, minimally invasive
Authors :
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RADIOINDUCED PELVIC SARCOMAS AFTER PROSTATE ADENOCARCINOMA

Abstract ID : 1122
Submitted by : IRENE LÓPEZ TORRES the 2016-02-03 11:05:41
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
The incidence of radiation-induced sarcoma is low and related information is not consistent. There are only reported single cases of sarcoma after the use of radical radiotherapy for the treatment of prostate adenocarcinoma.
Material and Methods
A descriptive study was carried out with ten cases of patients with a sarcoma in the pelvic area between 2006 and 2014. All of them showed as background a prostate adenocarcinoma treated with radical radiotherapy. Cahan's diagnostic criteria for radiation-induced sarcoma were used. It was reviewed patient demographics, tumour characteristics and treatment, as well as of their influence on the results.
Results
The mean age of the patients at radioinduced pelvic sarcoma presentation was 72 years (60-79). The mean latent interval between radiotherapy treatment and diagnosis of pelvic sarcoma was 6.2 years (4-9) and median dose of radiotherapy given was estimated at 74Gy (70-78). The most common sarcoma's location was pelvic girdle in 6 cases (60%) followed by the pelvic cavity (2 visceral and 1 retroperitoneal) and a case in proximal femur. Undifferenciated high-grade pleomorphic sarcoma of bone (60%) and osteosarcoma (20%) were the most common histological diagnostics. Metastases were present at diagnosis in two patients. Surgical treatment with the intention to cure was done in patients with localized disease (80% cases), and five of them received adjuvant chemotherapy. Each patient was followed from biopsy date until actual date or patient death, without loss of patients during follow-up. The mean follow up was 14,2 months (2-43) The survival rate was 40% and 20% at one and two years for the patients treated with intention to cure, with a median overall survival of 12,69 months (2-43).
Discussion
In the literature there are only reported isolated cases of radioinduced sarcomas, so the present study may be the most extensive serie about this dissease.
There is widespread consensus of the poor results of pelvic sarcomas. Although the diagnostic and therapeutic management is similar to "spontaneous" sarcomas, radioinduced sarcomas are associated with worse prognosis and lower overall survival than spontaneous ones.
In our study the main histological diagnosis was the undifferenciated high-grade pleomorphic sarcoma of bone. This fact is not consistent with the available literature, were the most common radioinduced sarcoma is the osteosarcoma (50-60%).
Conclussion
The radio-induced sarcomas after pelvic radiotherapy have deadly consequences for the patient, with a high mortality rate in a short period of time.

Keywords : Radioinduced, sarcoma, pelvic
Authors :
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Raman Spectroscopy to identify changes across the margin in Osteosarcoma

Abstract ID : 1315
Submitted by : Jerome Davidson the 2016-02-15 13:10:10
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Raman Spectroscopy to identify changes across the margin in Osteosarcoma
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Introduction

Raman Spectroscopy is a non-invasive technique which does not damage cellular tissue. It can identify structural differences in materials and chemicals and provide a “molecular fingerprint”. In relation to bone it allows demonstration of the organic and inorganic phases of bone matrix. Currently it is used in the real time measuring of anaesthetic gases within the theatre environment. It uses the inelastic scattering of light from a laser once it interacts with a molecule.

A real time contact Raman spectroscopy probe has also been designed for intra-operative use in neurosurgery and the treatment of gliomas.

The use of Raman Spectroscopy has not previously been described in human bone osteosarcoma

The aim of this project is to identify whether Raman spectroscopy can differentiate between normal bone and osteosarcoma across the resection margin in fresh human resection specimens.

Materials / Patients and Methods

2 patients specimens from surgical resection of distal femoral osteosarcoma.
1 osteoblastic osteosarcoma
1 telangiatatic osteosarcoma

3 mm thick longitudinal section through specimen from transection point to distal femoral joint surface.

See Figure Specimen block

Multiple Raman spectra captured along cortical surface for 5 cm section crossing histological tumour margin. Samples were scanned fresh without preservation.

Results

Comparison of mean waveforms for Raman intensity showed some differences between normal bone and bone infiltrated with osteosarcoma

See figure Waveform

Principle components analysis showed obvious clustering in scores plots of spectra within the normal bone and osteosarcoma section of the margin in all elements of the first 3 principle components

See figure PCA

PCA P-A Mean Normal 18.17 Mean Osteosarcoma 15.87
PCA P-C Mean Normal 5.24 Mean Osteosarcoma 4.81

Conclusion

This early data shows that Raman Spectroscopy can identify changes in cortical bone and differentiate between healthy and abnormal bone in osteosarcoma. This early work could form the basis of the development of an intraoperative probe in order to confirm a safe distance away from tumour for achieving optimal resection margin and hence maximising oncological outcome while reducing morbidity for patients.

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Qiu S et al

Keywords : Osteosarcoma, Margin, Raman, Spectroscopy
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Supplementary material : http://sites.altilab.com/files/122/abstracts/raman-spectroscopy-to-identify-changes-across-the-margin-in-osteosarcoma-emsos-500w.docx, http://sites.altilab.com/
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RE-VISITING TOTAL AND PARTIAL SCAPULECTOMY – SHOULD WE REPLACE?

Abstract ID : 1507
Submitted by : Thomas Cosker the 2016-02-22 23:44:01
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives
High grade bone and soft tissue sarcoma of the shoulder girdle is uncommon and the required resection and reconstruction often poses significant surgical challenges. Total / partial scapulectomy is an accepted treatment for preserving shoulder girdle function and avoiding fore-quarter amputation following tumour excision. Of greater debate is whether or not to replace the resected scapula.

Methods
Between 2004-2013, 6 patients (4 male: 2 female) with a mean age 44.3 (17-83) underwent total scapulectomy and reconstruction with a custom-made scapula prosthesis at one of two tertiary sarcoma centres (one in USA, one in UK). A retrospective analysis was carried out on this cohort to evaluate surgical and functional outcomes. This was compared to an earlier study by the senior author where only scapula resection without endoprosthetic replacement was undertaken.

Results
Mean follow up of 52 months (7-79) was recorded. Early post operative range of movement was recorded as 39 deg forward flexion (0-60) and 36 degree of abduction (0-60). Mean Musculoskeleteal Tumor Society score (MSTS) was 80.7 (66.7-90) at latest follow up. There was no significant difference in the range of motion between those patients with an endoprosthetic replacement of the scapula and those without.

Conclusion
Whilst high grade sarcoma of the scapula and shoulder girdle pose a significant surgical challenges, there is no functional advantage with re-implantation of an endoprosthetic scapula replacement but the potential downside of significant cost and risk of infection.

Keywords : MPNST, cavity
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Reconstruction of distal radius giant cell tumor with non-vascularized fibular graft; A case report

Abstract ID : 1285
Submitted by : Cagri NEYISCI the 2016-02-14 15:34:41
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Giant cell tumor (GCT) is locally aggressive tumor of bone and it commonly localizes at the long bone ends. It is often seen between 20-40 years of age. The most common location for this tumor is the long bone metaepiphysis of the distal femur, proximal tibia, distal radius, and the proximal humerus respectively. Its treatment at distal radius is difficult because of wrist's complex anatomy and it has more recurrence rate at this localization. We aimed to present a case with GCT that located at distal radius, and treated with wide resection and reconstruction with non-vascularized fibular graft.
Materials and Methods: 21-year-old male referred to our clinic with the complaint of swelling and pain at his right wrist for 2 months. He had limitation at wrist flexion after 10 degrees; and wrist extension was limited at neutral position. On the X-ray there was lytic lesion with bone destruction at distal radial metaepiphyseal region. CT and MRI images of the lesion were also evaluated. He had no metastasis in his lung according thorax CT. The initial diagnosis was GCT of bone. After Tru-cut biopsy, histopathologic results revealed GCT. We resected 5,5 cm proximally from the distal radius articular surface and reconstructed with non-vascularized fibular graft. Lateral collateral ligament was used for knee stabilization and fixed to proximal tibia with a 3,5 mm anchor. Fibula was stabilized with plate and screws. Extensor carpi radialis longus tendon was used for dorsal stabilization and fixed with two 3,5 mm anchor. Flexor carpi radialis tendon was used for volar stabilization and fixed with two 3,5 mm anchor. Extensor carpi ulnaris tendon was used for distal radioulnar joint stabilization and fixed with a 3,5 mm anchor from radial side of ulna to dorsal side of fibula. A K-wire was used for radiocarpal stabilization from fibula to carpals and two K-wires were used for radioulnar stabilization from fibula to ulna. Long arm cast was applied for 3 weeks of immobilization. After 3 weeks radiocarpal K-wire was removed and wrist splint used. 20 degrees passive flexion and extension motion was allowed. In the end of the first month all K-wires were removed. After 6 weeks of surgery, splint usage stopped and besides 20 degrees active flexion extension movements, pronation-supination were allowed.
Results: After 2 months of surgery, there were no complaint of pain. The wrist of motions was 20 degrees of flexion and 30 degrees of extension after 3 months of surgery. There was any complication at postoperative 6 months.
Conclusion: Giant cell tumor is one of the aggressive tumors of bone and it was commonly treated with chemical cauterization, aggressive curettage and cementation. Similar to our case, some functional limitations may occur with reconstruction of GCT. It is very important to plan surgical technique of distal radius GCT to avoid unnecessary and aggressive attempts. It is essential to keep in mind that insufficient surgery at the risk of protecting functions may cause repetitive operations and lung metastasis.

Keywords : Giant cell tumor, Distal radius, Non-vascularized fibular graft, Reconstruction, Wrist stabilization.
Authors :
References : , , ,

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Reconstruction of iliac Ewing sarcoma with non-vascularized fibular graft

Abstract ID : 1286
Submitted by : Cagri NEYISCI the 2016-02-14 15:40:50
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Ewing sarcoma is a malignant round cell tumor of bones. It originates from flat bones commonly. Pelvis is second involved bone. Reconstruction of pelvis is challenging because of its complex anatomy. In this report we present Ewing sarcoma on iliac wing treated with resection and reconstruction with non-vascularized fibular graft.

Materials and Methods: A 12-year-old female referred to pediatrician with pain and mass on right lumbar region. At radiologic images there was lytic lesion on right iliac wing and a soft tissue shadow. On MRI there was 8x8 cm sized mass at iliac wing. It was not spreading to sacroiliac joint. We've performed a Tru-cut biopsy and histopathologic results revealed Ewing sarcoma. Chemotherapy was applied. After regressing of soft tissue component of the tumor, we performed wide tumor resection on the iliac wing and non-vascularized fibular graft reconstruction with Kirschner wires. Incision was closed primarily.

Results: Postoperative first day patient was allowed to walk without weight-bearing. After the occurrence of incision site necrosis, a skin revision surgery was performed. After six weeks she began to walk with weight-bearing. On the fifth month of surgery the K wires were removed. The patient has full range of motion at hip and her walking was normal with a little limping.

Conclusion: Ewing sarcoma is a malignant bone tumor, commonly seen on flat bones in childhood. Pelvic reconstruction is challenging because of its complex anatomy. Excision, tumor prosthesis, custom made prosthesis and vascularized or non-vascularized bone grafts are reconstruction options. Non-vascularized fibular graft is a good option for pelvic reconstruction.

Keywords : Iliac wing, Non-vascularized fibular graft, Ewing sarcoma
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Reconstruction with Blade Plates in Fibrous Dysplasia of the Proximal Femur

Abstract ID : 1275
Submitted by : Bas Majoor the 2016-02-14 11:19:59
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
The management of fibrous dysplasia (FD) of the proximal femur poses challenges for the orthopaedic surgeon due to the recurrent nature of FD and the variety of forces that act on the proximal femur. We have previously identified a preoperative fracture as a risk factor for cortical allograft surgery, arguing that mechanical reconstruction is preferable in a selection of patients. In our centre we prefer the use of blade plates (BP), both standard and customized. The purpose of this study was to evaluate the outcomes of blade plates in patients with FD of the proximal femur who had sustained a fracture, had severe varus deformation or had challenging involvement of the diaphysis,

Patients & Methods
The outcome of BP-surgery of 16 proximal femurs in 15 patients (9 male and 6 females) was retrospectively evaluated from data obtained from hospital records between 1985-2015. Mean age at surgery was 24.5 years (range 11-67) and primary outcome was the success rate of BP-surgery, as measured by the need for revision surgery for recurrent fractures or progressive deformity. Both standard blade plates (9) and customized blade plates (7) were used.

Results
FD was monostotic in three patients (20%), polyostotic in 9 patients (60%) and three patients (20%) had McCune-Albright Syndrome. At least one fracture was sustained at 11 proximal femur sites (69%) prior to surgery. Failure of previous surgery of the proximal femur was observed in ten femurs, including cortical allograft surgery (6), Nancy nails (2) and a plate osteosynthesis (1). The indications for surgery were fractures (44%), extensive deformity (44%) and persistant pain (13%).
Seven femurs were treated with valgus osteotomy, 8 had additional placement of a cortical allograft and 3 of a cancellous bone-graft. After a mean follow-up of 6.1 (± 8.3 SD) years after surgery, only two femurs (13%) required a reoperation, both because of a pathological fracture distal of the blade plate. Both patients were treated with an extended BP to cover the distal fracture with good functional outcome.

Conclusion
This study suggests that blade plates are a valuable therapeutic option in patients with fibrous dysplasia of the proximal femur in whom cortical allograft surgery is not indicated because of a fracture, severe deformity or diaphyseal involvement, all of which are associated with high risk of failure. The blade plate should preferably extend to the whole length of the fibrous lesion, in order to prevent distal fractures. To our knowledge, this is the first report on the valuable use of customized blade plates in FD, which offer accurate alignment of the implant in severely deformed bone, thus providing better protection against fractures.

Keywords : Fibrous Dysplasia, Proximal Femur, Blade Plate
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Recurrent osteomyelitis of the distal femur 4 years after radiofrequency ablation of a suspected osteoid osteoma.

Abstract ID : 1323
Submitted by : Stéphane Cherix the 2016-02-15 15:34:07
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Osteoid osteoma (OO) is a painful benign tumour of cortical bone, consisting in an intense oedematous and sclerotic reaction of bone surrounding a small core of tumour cells (the nidus). Radiofrequency ablation (RFA) is the treatment of choice for most OO, although some lesions may be treated surgically, or even conservatively.
Chronic (focal) osteomyelitis (Brodie's abscess) may mimic OO in clinical and radiological presentation and hence accidentally be treated by RFA.
We present the case of a 17 yo patient who presented with a recurrent osteomyelitis of the distal femur 4 years after RFA of a suspected OO.
Case presentation:
A 17 yo athlete complained of posterior knee pain in extreme flexion. He had no other local or general symptoms. He had been treated by RFA 4 years earlier for a suspected OO of the posterior distal femur, which actually proved to be focal chronic osteomyelitis (Brodie's abscess) on biopsy. Evolution was favourable without additional antibiotic treatment.
Imaging showed a corticalized defect of the posterior femur at the site of the former RFA, filled up with dense fibrous tissue. No other sequel of the treatment was present. Surrounding medullary and metaphysel bone displayed diffuse oedema. Core needle biopsy revealed scar tissue. The defect was curetted and filled up with graft and local antibiotics. Pathology and microbiology analyses revealed chronic low grade methicillin-sensitive Staphylococcus aureus (MSSA) infection. The patient healed eventless after 3 months of antibiotherapy with Bactrim® and returned to sport at the same level.
Discussion:
Chronic osteomyelitis is a well known differential diagnosis of OO, and there are several cases of RFA performed accidentally for osteomyelitis described in the literature. In some cases, good results have been reported, even without additional antibiotherapy, whereas in others, severe septic complications occurred. Unlike in the present situation, in case of unexpected osteomyelitis discovered after RFA for a suspected OO, adequate treatment of the bone infection should be discussed.
There are little data on late consequences of RFA, in particular regarding bone necrosis, growth disturbance or late pathologic fracture. In the present case, there was a 3 cm corticalized bone defect filled up with (infected) fibrous scar tissue, causing functional impairment of the knee. To our knowledge, there is no equivalent sequel of RFA described in the literature. Long-term clinical and radiological follow-up should be discussed after RFA performed in a growing bone.

Keywords : Osteoid osteoma; percutaneous cryoabaltion therapy; osteomyelitis
Authors :
References : , , ,

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Recurrent, low – grade chondrosarcoma of the cervical spine. Decompression of the spinal medullar canal and revision of the posterior cervical stabilization by anterior approach to cervical spine

Abstract ID : 1461
Submitted by : Konstantinos Tsanidis the 2016-02-22 12:19:49
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

We are presenting a very difficult and rare operation in the cervical spine.
A patient 57 years old suffers of low – grade chondrosarcoma since 1990
(26 years). The patient underwent to numerous operations including disarticulation of his right leg.
The last 4 years the tumour shows an increased activity in the cervical spine and in the right brachial plexus. On February of 2012 the patient presented intense neurological signs due to compression of the cervical spinal cord. The patient underwent to a very difficult posterior decompression and resection of the T1 and the half of T2 vertebra body and reconstruction with spinal cage and further stabilization with posterior spine stabilization system, using 4 rods and screws in the cervical and thoracic spine, due to transition from the cervical to the thoracic spinal curvature. The result was excellent and the patient could even walk with his right prosthetic leg without crouches. His left hand regained normal function as the left leg as well. His right hand presented deterioration in motion. Despite the attempt to excise the tumor from the right brachial plexus by trans-thoracic approach, the tumour presented an intense development within the roots of the plexus.
Unfortunately the tumor continued growing in the cervical spine and within 4 years the patient presented again symptoms from the cervical spinal cord compression. On September of 2015 he underwent to anterior supra-sternum approach to the cervical spine, removal of the spinal cage, excision of the T2 remaining vertebral body and the C7, C6 and C5 vertebral bodies and reconstruction with expandable spinal cage with the use of O-ARM. A large amount of tumor was removed, both from the cervical medullar canal and from the sides of the spinal column, especially from the right side. The posterior stabilization was left intact after intra-operative evaluation as stable.
The response of the patient to the therapy was amazing. After 6 weeks he regained the full motion and the strength of his left lower and upper limb and he could stand without crouches.
Such huge operations considered as meaningless from many surgeons but offer the opportunity to the patients to live a decent life. Although is very difficult such a decision from the surgeon because there is conflict between the patient's will and the expected benefits. Fortunately the benefits arising after operation of low-grade chondrosarcomas are surprising more than the expected.

Keywords : chondrosarcoma, cervical spine, anterior reconstruction,
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Supplementary material : http://sites.altilab.com/files/122/abstracts/emsos-nantes-france-2016.doc, http://sites.altilab.com/
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Reliability and validity of the musculoskeletal tumor society scoring system for lower extremity

Abstract ID : 1269
Submitted by : Iwata Shintaro the 2016-02-14 06:52:28
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: The Musculoskeletal Tumor Society (MSTS) scoring system is the most widely used functional evaluation tool for a patient who underwent musculoskeletal tumor treatment. However, there are few reports confirming the reliability and validity of the system. We sought to determine whether the MSTS scoring system for the lower extremity had sufficient reliability and internal consistency, adequate construct validity, and reasonable criterion validity compared with the Toronto Extremity Salvage Score (TESS) or Short Form-36 (SF-36) using psychometric analysis.
Methods: One hundred patients diagnosed with intermediate/malignant bone or soft tissue tumors localized in the lower extremity and who had undergone definitive surgery participated to this study. Reliability was evaluated by test–retest analysis; internal consistency was established by Cronbach's alpha coefficient. Construct validity was evaluated using the principal factor method and Akaike information criterion (AIC) network. Criterion validity was evaluated by comparing the MSTS scoring system with TESS and SF-36.
Results: Test–retest analysis demonstrated high intraclass correlation coefficient, although a considerable ceiling effect was observed. Cronbach's alpha coefficient was 0.87, suggesting a high level of internal consistency. Factor analysis revealed that all items had high loading values and communalities; we identified a central role for the items "walking" and "gait" according to the AIC network. Total MSTS score was significantly correlated with that of TESS and physical component summary and physical functioning of SF-36.
Conclusions: The MSTS scoring system for lower extremity has sufficient reliability, favorable internal consistency, adequate construct validity, and reasonable criterion validity.

Keywords : MSTS score, psychometric analysis, TESS, SF-36
Authors :
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Replacement of Femur Bone Metastatic Defects

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Submitted by : Oleg Vyrva the 2016-02-21 22:45:23
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
The lower limb bones are the common site of metastatic lesions (67%) and especially the femur (54%). Most metastases are lytic lesions. There is a high risk of development a pathological fractures. At the same time, lost support ability of the affected limb and significantly decreases the patient's ability to self-service. Wide tumor resection and replacement of bone defects by different implants combined with bone cement (plates, intramedullary nails, endoprosthesis) are performed with solitary bone metastases of different localization. The fractures of the implants occur in some cases. The main goal of this study was to determine the most optimal replacing method of post-resection femur metadiaphysis defects for patients with solitary metastases.
Materials and Methods
The custom made titanium construction to replace post-resection distal femur metadiaphysis defects was designed. The design consists of the L-shaped plate, cylindrical module, intramedullary stem, which are joined together by screws. The mathematical finite element method was used. The femur with simulating defects in different locations was the base model. The study included 4 models of the femur with various types of the replacement post-resection defects: a model with partial distal femur defect which was replaced by L-shaped plate and the bone cement; L-shaped plate, bone cement and two intramedullary nails, metal construction and a model with a partial distal femur defect which was replaced by intramedullary nail and bone cement. Stress-deform conditions were studied at three main types of load: axial, flexion, rotation.
Results
– maximum stresses during work of construction which consists of L-shaped plate and bone cement arises in the "implants-bone" contact zone of distal femur;
– load peak is localized in the contact zone "implants-bone" in proximal femur during work of construction which consists of intramedullary nail and bone cement.
Conclusions
The lowest stresses was observed in the "implant-bone" contact zone using bone cement, L-shaped plate and intramedullary rods, as well as the use of the proposed construction for replace defects in the metadiaphysis of distal femur. Also modular endoprosthesis replacement is method of choice for replacement of proximal femur defect according to high risk of implant fracture using intramedullary nail and cementation this part of femur bone.

Keywords : Femur Bone, metastases, surgical replacement
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Reverse Total Shoulder Arthroplasty after tumor resection in primary and revision implants: a report of 20 cases

Abstract ID : 1356
Submitted by : Ruggieri Pietro the 2016-02-17 05:10:58
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. The rotator cuff is often sacrificed after resection of the proximal humerus tumors and it is a challenge to restore better shoulder function after limb salvage.
Given the recent interest in new methods of shoulder reconstruction, the reverse shoulder arthroplasty improved active shoulder range of motion with abduction and forward flexion. The aims of this study are to share the experience of treating a series of patients with proximal humerus tumors treated by wide resection and reconstruction with reverse total shoulder arthroplasty, and to present the preliminary results of the mid-term outcome and complications encountered
Material and Methods. We retrospectively reviewed 20 patients, with the mean age of 47.5 years, who had undergone reverse total shoulder prosthesis (RTSA) for proximal humerus tumors between 2005 and 2014. Diagnosis was: 6 giant cell tumors, 7 chondrosarcomas, 4 metastases and 3 plasmocytomas. Fifteen patients received primary surgery with RTSA while the others had revisions after a failed primary reconstruction.
Results. All the patients were alive at a mean follow up of 45.4 months. One patient developed a local recurrence and was treated with electrochemotherapy. None developed distant metastases. The mean functional MSTS score was 25.5 with mean active abduction of 60°. Two patients required revision: one for dislocation of the prosthesis and the other for plastic wear and resorption of the allograft.
Conclusion. The use of RTSA for proximal humerus tumor reconstruction is a reasonable option, when the deltoid muscle and axillary nerve can be spared.

Keywords : Shoulder; Tumor; Technique
Authors :
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Risk factors associated with in-hospital postchemotherapy mortality in patients with malignant musculoskeletal tumors

Abstract ID : 1445
Submitted by : Toru Akiyama the 2016-02-22 08:53:48
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives: Reducing the in-hospital postchemotherapy mortality rate in patients with malignant musculoskeletal tumors is important for improving treatment outcome. This study aimed to investigate the risk factors associated with in-hospital postchemotherapy mortality in patients with primary malignant musculoskeletal tumors.
Methods: Using a Japanese national inpatient database, we retrospectively identified 5,039 patients (2,920 men and 2,131 women; mean age, 39 years) who underwent curative chemotherapy for malignant musculoskeletal tumors between 2007 and 2010. We extracted data on the patients' characteristics, complications, chemotherapeutic agent use, comorbidities, and in-hospital death. Logistic regression analyses were performed to analyze factors affecting in-hospital postchemotherapy death in these patients.
Results: The overall in-hospital mortality rate was 1.1%. Higher in-hospital mortality rates were significantly associated with a greater volume of blood transfusion (>2,500 mL) (odds ratio [OR], 49.71; 95% confidence interval [CI], 22.24–111.12; p <0.001), diabetes mellitus (OR, 3.05; 95% CI: 1.21–7.70; p = 0.019), and older age (OR, 3.05; 95% CI, 1.11–8.37; p = 0.031).
Conclusions: Higher in-hospital postchemotherapy mortality rates were associated with massive blood transfusion, which was associated with a 16 fold higher risk of in-hospital mortality compared with other risk factors. Blood transfusion volume should be considered an important indicator for deciding whether the next cycle of chemotherapy is administered continuously or not.

Keywords : chemotherapy, in-hospital mortality, chemotherapy-related death, Japanese Diagnosis Procedure Combination database
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Scaffold as a biological guiderail for periacetabular tumor after patient specific guided resection - a new way for operative treatment in pelvic tumors?

Abstract ID : 1305
Submitted by : Andreas Krieg the 2016-02-14 21:59:50
Category : Pelvic bone tumours
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: The reconstruction of osseous structures in the periacetabular area after tumor resection is one of the big challenges of the oncological orthopedics. Particularly the reconstruction of the acetabular region seems to be until now an unresolved problem. The hitherto existing solutions, e.g. autografts, allografts, metallic prostheses, do not ensure a long-term, stable and functional reconstruction. A novel solution has been developed at our hospital in Basel. Three years of investigations, development and biomechanical experiments have lead us to design a patient-specific titanium scaffold with a unique structure and very promising biomechanical characteristics allowing the stability and the bone ingrowth. In cooperation with the group of Copenhagen up to now the new scaffold has been implanted in four patients.

Methods: We performed several biomechanical experiments on native cadaveric pelvises as well as on the pelvises with implanted scaffolds. On the basis of these tests and a close cooperation with an implant manufacturer a computer-assisted scaffold design methodology has been developed, which allows the patient-specific implant design, its manufacturing and surgical implantation. The whole design process is based on the CT data of the patient and involves the data segmentation, anatomical modeling, surface processing and biomechanical simulations. The designed scaffold virtual model is transferred to the industrial 3D printer and manufactured as partly porous and partly solid titanium scaffold. A modular construction allowed an easier insertion of the scaffold during the operation. Also the additional use of patient specific resection guides permit the change from a two stage to a one stage procedure to reduce significantly operation time and costs. The scaffold design, manufacturing and implantation has been applied on five patients with malignant periacetabular bone tumor or single renal metastases.
Results: The two stage approach has been performed in the first two cases. At the first stage the bone tumor has been resected and the CT dataset of the resected bone has been acquired. After ten days the manufactured scaffold has been operatively inserted into the reconstruction site and fixed to the bone with the modular fixation plates. The two cases after the two stage procedure have been operated then in a one stage procedure with custom made specific resection guides and direct implantation of the scaffolds. The resection guides could be satisfactorily applied in all cases with relative ease, permitting quick and efficient reproduction of the planned osteotomies (n=15) with a high degree of accuracy (maximum resection-implant gap of 0-3mm). Histologically all resection margins were neagative as planned except in one case where the os pubis resection was extended due to intraoperative concern. Post-operative imaging demonstrated satisfactory implant Position. All cases were clinically and radiologically analysed.
Conclusion: This technology affords high intraoperative accuracy, surgeon confidence and decreased operative time and is certain to develop into a promising treatment option for complex pelvic tumors in the future.Short til midterm term results are promising, however implants have to prove the longterm stability and biological compatibility

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Keywords : pelvic tumors, patient specific implants, sarcoma, scaffold
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Serum albumin and creatinine are associated with risk of mortality and overall survival in patients with malignant fibroblastic sarcomas

Abstract ID : 1324
Submitted by : Madeleine Willegger the 2016-02-15 15:54:59
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

Despite major advances in the knowledge of soft tissue sarcoma (STS) during the last decades, no significant improvement in survival has been observed with reported mortality rates of about 50%. Malignant fibroblastic and myofibroblastic sarcomas count for the most common STS localized in the extremities with a reported high rate of local recurrence and mortality. While the prognostic value of some factors, e.g. high tumor grade and inadequate surgical resection, are generally accepted, the significance of other factors such as pre-operative laboratory parameters is a recent focus in STS research.
To validate previous findings for prognostic laboratory parameters in STS and to evaluate the outcome of malignant fibroblastic and myofibroblastic sarcomas, a retrospective analysis of survival and pre-operative laboratory parameters in fibrous tissue STS has been conducted. Albumin and creatinin levels and the previously described ACR (albumin creatinin ratio) were evaluated in a consecutive series of patients with surgically treated malignant fibroblastic and myofibroblastic sarcomas.

Methods

A retrospective review of 165 patients who underwent surgical resection of a malignant fibroblastic or myofibroblastic sarcoma in a specialized musculoskeletal tumor department between November 1996 and October 2014 has been conducted. The following histological subtypes were included: fibrosarcoma, myxofibrosarcoma, fibromyxoidsarcoma, spindle-cell sarcoma and sclerosing epitheloid fibrosarcoma. Pre-operative blood tests had to be available with a maximum interval of 14 days pre-operatively obtained and a concise and complete follow-up regarding survival and disease progression or recurrence. Kaplan-Meier curves, uni- and multivariable viariable Cox proportional hazard models and competing risk analysis were performed to evaluate the association between putative biomarkers with disease-specific and overall survival.

Results

In total 115 patients had been included. The median age at operation was 65.9 years (range 13.8 – 92.9). The cohort showed a slight female predominance with 52.2% (n=60) of included women. 68.4% (n=78) of sarcomas were high grade lesions (G3). Sixty-nine patients (60.5%) suffered from AJCC stage III or IV disease at baseline. The median follow-up in our patient cohort was 5.1 years. A quarter of the patients developed metastasis (25.2%, n=29) and 12.2% (n=14) suffered from local tumor recurrence during follow-up. The 5-year risk of all-cause death was 34.4% (95%CI: 25.6-45.1), and the 5-year risk of death-from-fibrosarcoma (treating deaths-from-other-causes as competing risks) was 17.3% (95%CI: 10.5-25.5). Creatinine and the ACR (Albumin-Creatinin Ratio) were associated with both overall and disease-specific survival. Serum albumin emerged as borderline associated with overall survival, but not associated with disease-specific survival (HR=0.94; 95% CI 0.89-0.99; p=0.022 and SHR=0.94; SHR= 0.94, 95% CI 0.85-1.05; p=0.27).

Conclusion

This study supports the recent finding of serum albumin and creatinin beeing a prognostic biomarker for disease specific survival in soft tissue sarcoma.
These biomarkers could be exploited for individual risk estimation and integrated in existing prognostic models for soft tissue sarcoma in future.

Keywords : prognostic factors, soft tissue sarcoma, creatinine, albumin
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Serum sclerostin levels in renal cell carcinoma patients with bone metastases

Abstract ID : 1102
Submitted by : Christine Wibmer the 2016-01-29 20:46:23
Category : Targeted Therapy
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: Sclerostin is a potent inhibitor of bone formation. Newly developed humanized sclerostin antibodies underwent phase-II studies for the treatment of osteoporosis (Romosozumab, Blosozumab), and are also discussed as future therapeutic option for metastatic bone disease. Serum sclerostin is elevated in multiple myeloma, an osteolytic malignancy. Renal cell carcinoma (RCC) often presents with osteolytic metastases, we therefore investigated sclerostin levels in RCC-patients with bone metastases, visceral metastases, localized disease and compared them with healthy controls.
Methods: The series included 55 RCC-patients (20 with bone metastases, 26 with visceral metastases, 9 with localized disease) and 55 age- and gender-adjusted non-osteoporotic controls. Quantitative sandwich ELISA was performed from frozen serum samples.
Results: The mean serum sclerostin levels of RCC –patients and controls were 45.5 pmol/l and 44.6 pmol/l respectively, t-test revealed no difference between them (p=0.82). Analysis of variance showed no difference between the subgroups of RCC-patients with visceral or bone metastases or localized disease and their corresponding healthy controls (p=0.23). There was no significant association between eGFR (estimated glomerular filtration rate) and serum sclerostin levels in RCC-patients (p=0.71) and controls (p=0.62). Mean eGFR of the RCC-patients (52.5 ml/min/1.73 m²) was lower than in the controls (89.4 ml/min/1.73 m²).
Conclusion: The results of our study indicate that other approaches than serum sclerostin levels are needed to help selecting RCC-patients, who might benefit from sclerostin antibodies as an additional treatment option for bone metastases.

Keywords : Renal cell cancer, sclerostin, bone, metastases, osteolytic
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Serum silver concentrations following extremity reconstruction with silver-coated megaprostheses

Abstract ID : 1106
Submitted by : Joerg Friesenbichler the 2016-01-30 22:44:16
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Silver-coated megaprostheses have been introduced to reduce the risk of infection following extremity reconstruction. Nonetheless, there is less information about systemic silver exposure, clearance and possible side effects. The aim of the study was to report the blood silver concentrations during a follow-up up to eleven years.
Materials and Methods: Between 2004 and 2014, 35 patients (20 female and 15 male) received MUTARS megaprostheses with galvanised silver coatings (Implantcast, Buxtehude, Germany). The mean age at operation was 49 years (range, 10-81). Thirdteen patients received the prosthesis after resection of a malignant soft-tissue or bone tumour. Twenty-two silver-coated implants were used for revision surgeries as prophylaxis against recurrent infection or in case of poor soft tissue coverage. The mean postoperative follow-up ranged from one to 132 months.
There were 14 proximal, nine distal, three total, and one intercalary femoral reconstructions as well as one femoral stump prosthesis. Furthermore, four proximal tibias and one proximal humerus were replaced. In two cases a sliver-coated arthrodesis nail for the knee was used.
Blood for silver concentration determination was taken from every patient within the first days following surgery as well as at every six months at outpatient treatment.
The concentration of silver was determined using inductively coupled plasma mass spectrometry (ICP-MS, Agilent, Waldbronn, Germany) after microwave-assisted digestion with nitric acid in a microwave-heated autoclave (MLS ultraClave III; MLS-Mikrowellenlaborsysteme, Leutkirch, Germany).
Results: During the follow-up three patients died of disease, five died due to an unrelated cause and six patients were lost to follow-up.
Overall, 21 patients were available for determination of blood silver concentrations; most of them appeared routinely to the outpatient care, whereas some appeared every once in a while.
Nevertheless, the follow-up showed an increment of systemic silver concentrations within the first six months following implantation, followed by a decrease during 36 months – this phase could be called “run-in periode”. Thereafter, we found an undulation course of blood concentrations with further peaks which might be caused by several cases of re-infections and massive release of silver ions from prostheses’ surface (Table 1 & Figure 1). Otherwise, we also observed silver increments in patients without any clinical sign of prosthetic infection.
Discussion: There are several studies in the literature reporting outcome and implant survival of silver-coated megaprostheses but less is known about systemic silver exposure and long term effects.
In the current series we observed an undulating course of silver concentrations in the blood of our patients which might be caused by re-infections or other implant-associated complications. We could not identify any systemic complications like polyneuropathia or other toxic reactions, except of local agyria. Therefore, we can state that silver-coated implants seem to be a save solution in case of megaprosthetic reconstruction following tumour resection. On the other hand, if the silver coating of the prostheses has a lasting effect on re-infection rates in case of revision surgery or in case of poor soft tissue coverage has to be evaluated. Nonetheless, we recommend monitoring of silver concentrations in the blood.

Keywords :
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Spinal metastasis of intracranial hemangiopericytoma: Report of two different treatment techniques in the same patient and review of the literature

Abstract ID : 1380
Submitted by : Fernando Araujo the 2016-02-19 13:50:06
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Hemangiopericytomas were described as vascular tumors arising from the contractile cells around the capillaries, the "pericytes". Actually, they represent a continuum with the solitary fibrous tumors. Intracranial Hemangiopericytomas are rare, comprising about 2.4 % of meningeal tumors and less than 1 % of all tumors of the central nervous system, and metastases to the spine are even rarer, with the greatest series reported in the literature containing 5 to 7 cases.
Objective: Report the use of two techniques (radiosurgery vs. en bloc vertebrectomy) in the same patient for treating spinal metastases at two different sites arising from intracranial hemagiopericytoma.
Materials and Methods: A 37- year-old man diagnosed with intracranial hemangiopericytoma was sent with metastatic lesion in T12, undergoing en bloc resection according to Tomita's technique. It progressed with metastasis in T3, undergoing treatment with radiosurgery with 1600 cGy.
Results: The patient presented as a complication in the postoperative period chylothorax and nonunion of arthrodesed segment. The patient underwent drainage of the chest and arthrodesis revision. He didn’t present any complications of the radiosurgery procedure. The patient died of systemic disease progression (hepatic and CNS) 1706 days after T12 en bloc resection/ 1324 days after T3 radiosurgery, free of new mestatasis at these sites.
Conclusion: This is the first case reported in the literature in which two different techniques are used to treat intracranial hemangiopericytoma metastatic lesions in the spine, making it unique in the fact of being case-control of two forms of treatment. In our opinion, both techniques can be effective, if the choice is made with precision and discretion.

Keywords : Spine; hemagiopericytoma, metastatic, en bloc resection, radiosurgery
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Spinal metastasis of intracranial hemangiopericytoma: Report of two different treatment techniques in the same patient and review of the literature

Abstract ID : 1380
Soumis par : Fernando Araujo Le 2016-02-19 13:50:06
Nom de la catégorie : Others
Typologie : Poster
Statut : validé
Autorisation de diffusion : Yes/Oui

Introduction: Hemangiopericytomas were described as vascular tumors arising from the contractile cells around the capillaries, the "pericytes". Actually, they represent a continuum with the solitary fibrous tumors. Intracranial Hemangiopericytomas are rare, comprising about 2.4 % of meningeal tumors and less than 1 % of all tumors of the central nervous system, and metastases to the spine are even rarer, with the greatest series reported in the literature containing 5 to 7 cases.
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Mots clefs : Spine; hemagiopericytoma, metastatic, en bloc resection, radiosurgery
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Spontaneous physical activity promotes liposarcoma growth in nude mice: involvement of the tumor suppressor pathway p38-MAPK/p21

Abstract ID : 1208
Submitted by : Mohamad Assi the 2016-02-11 16:14:08
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Liposarcoma (LS) is an aggressive and rare tumor that arises from adipocytes and fibroblasts within deep soft tissues. It develops mainly in lower limbs of patients and, therefore, directly affects the musculoskeletal and locomotive apparatus. Clinically, patients with LS often experience a preoperative period, of several months, between diagnosis and chirurgical intervention. Moderate physical activity (PA) has been shown to improve the quality of life of patients with colon, lung, prostate and breast tumor, by negatively affecting cancer growth, progression and recurrence. However, there is no recommendation regarding the potential benefits of PA for LS patients during the preoperative period, hence the need of a pre-clinical study. Herein we aimed to (1) determine the impact of PA on LS evolution and (2) elucidate signaling and molecular pathways that could potentially influence tumor growth.

Materials and methods: During the first six weeks of protocol, eighteen 4-week-old nude mice were active on activity wheels placed individually in their cages. Then mice have received an intra-muscular injection of, 2×106, human LS SW872 cells and divided into two groups: (1) nine LS mice remained active (LSA) with an access to activity wheels and (2) nine LS mice became inactive (LSI) with no more access to wheels. After eight weeks post-injection (PI) mice were sacrificed. Venous blood, skeletal muscle, liver, lungs and tumor were removed to perform histological and molecular analysis.

Results: Total body weight, food intake, hematocrit and hemoglobin rates remained unchanged in both groups. Unexpectedly, LSA mice exhibited reduced muscle strength and endurance compared to LSI group, and progressively lost the ability to perform daily physical activity. At the same time, we found that tumor weight was dramatically higher in LSA comparing to LSI group. Mitotic index and ki-67 staining on tumor sections were significantly increased in LSA mice. Histopathology analysis on tumor and lung sections revealed that both groups have developed an undifferentiated LS of grade-3 and a low number of pulmonary metastasis. However, apoptosis (i.e. cleaved caspase-3, bax/bcl-2 ratio), necrosis and angiogenesis markers (i.e. CD31 staining, VEGF protein expression) remained unchanged. At the molecular level, the expression of phospho-p38 MAPK (protein level) and its downstream target p21 (mRNA and protein), an inhibitor of cell cycle at G1/S phase, was dramatically increased in tumor extracts of LSI mice, independently of p53. Indicating that the tumor suppressor pathway p38-MAPK/p21 was blunted in tumor of active mice and highly activated in the inactive group.

Conclusion: Our data indicate that maintaining a regular PA creates a favorable microenvironment for tumor growth in mice, through hampering the induction of the p38-MAPK/p21 pathway within tumor and, subsequently, alters the capacity of muscle to ensure basic physical needs. Therefore, a temporary period of inactivity may be advised for LS patients before chirurgical intervention.

Keywords :
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Sports activity levels in survivors after proximal humerus modular endoprostheses

Abstract ID : 1309
Submitted by : Gerhard Hobusch the 2016-02-14 22:53:49
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
Sports activity levels in patients after limb sparing surgery due to bone sarcomas in the proximal humerus are not yet assessed.
Methods:
We conducted an explorative, single-institution study of eleven patients (4 male, 7 female; mean age at surgery 17±7 years; average follow-up 18±6years [minimum, 5 years]) using a questionnaire to assess UCLA Sports activity levels, types of sports and the frequency of participation before and after a surgical procedure. Furthermore, we searched for differences between patients with and without complications in their follow-up and whether operation of dominant or non-dominant arm made a difference in sports activity.
Results:
1 year prior to surgery all of our 11 patients were performing sports regularly, 1 year after surgery 4 patients (36%) participated in sports regularly, 3 years after surgery 9 patients (82%) and at a minimum of 5 years of follow-up all patients were performing sports regularly. The most common types of sports were bicycling (6/11), walking/hiking (6/11), full-body exercise at the gym or at home (5/11), including weight lifting or isometric exercises for the operated arm, swimming (2/11) and running (2/11). UCLA 1 year prior to surgery (mean 9±1) dropped one year (mean 4.8±1.8) and three years (mean 5.9±2) postoperatively to reach prior-surgery-levels at a minimum of 5 years follow-up (mean 8.3±1.9). For numbers available after 5 years no differences in sports activity levels could be found whether dominant or non-dominant arm had been operated (p = 0.841) or complications occurred or not (p value = 0.122).
Conclusion:
Survivors after bone sarcomas can participate in high levels of sports activity, without regard to the dominant or non-dominant arm being affected or complications occurring in follow-up. This information is very important for an improved counseling prior to surgery in terms of sports expectations following the procedure.

Keywords : primar malignant bone tumors, proximal humerus modular endoprostheses, sports activity, survivors
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Stabilization of pathological fractures of the proximal femur - total hip arthroplasty vs. proximal femoral nail - comparison of the outcome of two procedures

Abstract ID : 1327
Submitted by : Saskia Sachsenmaier the 2016-02-15 18:47:03
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
The survival time of tumour patients with osseous metastases increases with numerous different therapy options. Consequently the number of pathologic fractures rises. One third of these fractures affects the proximal femur. A fast rehabilitation and a reduction of pain are the common goal of the surgical treatment.
We compared two standard procedures for pathologic fractures of the proximal femur - total hip arthroplasty (THA) versus cephalomedullary nailing (PFN). Aim of this study was to evaluate the different procedures and to identify the advantages and disadvantages of both procedures.

Materials and methods:
A retrospective analysis of the medical records of tumour patients with impending or manifest pathologic fracture of the proximal femur treated with total hip arthroplasty or proximal femoral nail osteosynthesis was performed. Outcomes of the two groups were compared in terms of surgical management, postoperative complications and functional scores.

Results:
A total of 61 patients after surgical treatment of the pathologic fracture of the proximal femur were included. 37 patients underwent total hip arthroplasty and 24 patients proximal femur nailing. The collective consisted of 31 male and 30 female patients. The mean age of the patients with THA was 66 years and 68 years in the PFN group. The time of hospitalization did not differ significantly between both groups. The rate of intra- and postoperative complications was 2,7 % in the THA collective and 8,3 % in the PFN collective. Postoperative infections were detected in two patients in each group. The number of revision after the initial operation was significantly higher in the PFN group (20,8%) than in the THA group (8,1%). The main cause for surgical revision in the PFN group was implant failure. Pain pre- and postoperative did not show significant difference between both groups, however a significant reduction was notable in both groups. After 6 weeks the function and mobility of the THA group was superior compared to the PFN group.

Conclusion:
We found a reduction of pain after surgical treatment in the same range for patients with THA and PFN. Patients after hip arthroplasty were less frequent affected by postoperative complications and they regained their mobility faster than the patients with proximal femur nail. The stabilization of pathologic fractures of the proximal femur is essential to re-establish the quality of life in tumour patients, the individual patients‘ profile should be considered by choosing the treatment strategy.

Keywords : pathologic fractures of the proximal femur, total hip arthroplasty and proximal femoral nail, comparison of two methods
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Standard biochemical variables are prognostic for survival in patients treated surgically for metastatic bone disease.

Abstract ID : 1120
Submitted by : Michala Skovlund Sørensen the 2016-02-03 08:57:05
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: Orthopedic oncology is in search of a prediction model that can assist surgeons predicting patient's residual life expectancy prior to surgery. Several models have been proposed. We aimed to identify if standard biochemical variables are prognostic factors for survival in patients undergoing surgery due to metastatic bone disease (MBD) in the appendicular skeleton.
Methods: A historical cohort of 270 consecutive patients undergoing joint replacement surgery at our tertiary referral center was identified. None was lost to follow-up. Standard biochemical variables were stated as: Hemoglobin, Leucocyte- and Neutrophil count, C-reactive protein (CRP) and Alkaline Phosphatases. They were dichotomized by the reference interval or by the median. Survival analyses were performed with Kaplan-Meier plots and Log-Rank Test for comparing groups. Furthermore, univariate and adjusted Cox-Regression analyses were performed.
Results: Kaplan-Meier plots showed decreased survival in high-risk groups with p-values <0.001 for all biochemical variables (see figure 1). Adjusted for type of primary cancer, ASA-score, and presence of visceral metastasis Cox-Regression identified all variables as prognostic for survival with significant (p<0.001) adjusted Hazard Ratios (aHR): Hemoglobin above 8 mM aHR: 0.52 (95%C.I.: 0.36 ;0.74), Leucocyte count above 8.9 x109/L aHR: 1.74 (95%C.I.: 1.30 ;2.3), Neutrophil count above 7.4 x109/L aHR: 2.08 (95%C.I.: 1.53;2.82), CRP above 30 mg/L aHR: 2.08 (95%C.I.: 1.53;2.82) and Alkaline Phosphatases above 143 U/L aHR: 2.14 (95%C.I.: 1.57;2.93).
Conclusion: Standard biochemical markers are prognostic for survival in patients undergoing surgery due to MBD and could be a valuable tool for the surgeon in the process of surgical planning.

Keywords : Bone metastasis, prognostic, biomarkers, survival
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/figure-1.pdf, http://sites.altilab.com/
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Sternal replacement with a porous alumina ceramic prosthesis.

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Submitted by : François BERTIN the 2016-02-12 20:50:27
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Typology : Poster
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Sternal tumours are rare and difficult to treat from a reconstruction point of view. For high grade primary tumours, wide resection remains the standard treatment.

Numerous kind of prosthesis or artificial and non artificial bone substitutes have been reported in the literature to reconstruct the sternal defect after resection but none have been fully successful regarding functional results and quality of reconstruction. The aim of the reconstruction should be an adequate stability to prevent any paradoxal breathing and sufficient solidity to protect mediastinal organs. Furthermore, It should be biologically neutral with a low risk of infection and radiologically transparent in order to allow an easy follow up.

The current authors report three patients who had a sternal replacement with a porous alumina ceramic prosthesis after total resection of the sternum for high grade sarcomas or metastatic disease. The mean follow up was 9 months (6- 12). There were 3 women aged 37, 52 and 55 There were I high grade radio induced sarcoma and 2 patients presented with metastatic disease from breast carcinoma.
At latest follow up, patients were all alive with no local complications
There were 1 respiratory complication (pneumonia). All patients had a stable , painless chest.. Ct scan at 3 and 6 months after surgery showed early sign of osteointegration in the prosthesis.

Discussion : the prosthesis is made of alumina of the highest standard. It's a chemical component of mineral source non resorbable and radiologically transparent. It is chemically and physically stable especially in case of associated treatment like radiotherapy. Mechanical resistance is high, around 20 MPa (cancellous bone = 7 MPa thus limiting the risk of breakage..Its interconnected porosity of 200 to 800 µm allows this material to act as an osteoconductive scaffold which improves osteointegration. In orthopaedic surgery, secondary osteointegration has been showed at 3 months when this material was used as a wedge in open tibial osteotomy.

Total sternal reconstruction with a porous alumina ceramic prosthesis is a safe and reliable method for reconstruction of the sternal bone after resection of select high grade sarcomas. The authors emphasize the clinical indications, prosthesis design, surgical technique and early functional results. These preliminary results need to be confirmed by a multicentric study which will start in France in 2016.

Keywords : Sternal replacement, porous alumina, ceramic prosthesis
Authors :
References : , , ,

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Strategies for Achieving Long-Term Stability of Proximal Humeral Reconstruction in Sarcoma Surgery

Abstract ID : 1509
Submitted by : Thomas Cosker the 2016-02-22 23:46:45
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aims: Bony sarcomas of the proximal humerus often require extensive resection of the proximal humerus +/- the rotator cuff apparatus. Options for reconstruction include free fibula with physis transfer and proximal humeral endoprostheses. Historically, dislocation has been the predominant problem with such operations. There are various surgical strategies which can be employed to stabilise the endoprosthesis. This paper critically appraises the surgical options available.

Methods: Twelve cases of bone sarcoma of the proximal humerus are presented in which various strategies have been used to stabilise the endoprosthesis.

Results: Using a well considered orthoplastic approach for such complex cases, we have significantly reduced our endoprosthesis dislocations and have had an improved outcome in terms of patient TESS scores and functional outcome measures. We present the residual complications we have experienced, revision surgery where required, long-term stability and overall functional outcome.

Conclusions: Stabilising the proximal humeral replacement remains surgically challenging. There are, however, several strategies which can be employed to minimise the chance of dislocation. The relative pros and cons of the various methods including use of the MUTARS tube, pedicled muscle transfer, vascularised 1st rib transfer, coracoid interposition and glenoidoplasty are discussed along with the relevant surgical techniques.

Keywords : humerus, shoulder, EPR
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Subtotal resection of bone to the metaepiphysis area in children with malignancies

Abstract ID : 1330
Submitted by : Vadym Kobys the 2016-02-15 20:56:48
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction. Minimum distance from the tumor when removing a malignant bone tumor was reduced to 0.6-2 cm. The results of the bone replacement in cases of subtotal lesions remain poor. Therefore, autoplasty of the defect with autoclave-treated and vascularized fibula bone for disseminated bone to metaepiphysal area in children with malignant tumors is a new promising method that improves the results of surgical treatment.
Materials and methods. In 2010-2015 we operated 8 children aged 9 to 14 years with malignant bone tumors with lesion length of about 2/3 of bone length. 4 patients had local osteosarcoma and 4 had Ewing's sarcoma (3 local and 1 metastatic). Osteosarcoma patients received preoperative and postoperative chemotherapy in accordance with ISG I protocol; Ewing sarcoma patients received preoperative and postoperative chemotherapy in accordance with EE 99 protocol. Follow up of patients after surgery lasted from 4 to 54 months.
Surgery was performed by two teams of surgeons: resection of the bone with the tumor was carried out by pediatric oncology surgeon, harvest of fibula in vascular pedicle and its implantation in place of bone defect by the team of pediatric microsurgeons. We used the technique developed in 1988 by R. Capanna, which is based on replacing the defect with massive allograft located in the middle of vascularized fibula. We used autoclave-treated fibula bone (132º C, 15-20 minutes) from the resection area instead of allograft.
Results and discussion. All patients underwent subtotal resection of the bone. In 2 patients with mild static load (ulna, fibula bone), only one vascularized fibula bone was used for transplantation. 6 patients underwent combined autoplasty with vascularized fibula bone and autoclave-treated bone from the resection area. Distance from the distal edge of the tumor ranged from 1 to 1.5 cm and from the area of growth from 0 to 4.5 cm. Up to now, 7 patients remain alive and relatively healthy; one of the patients is lost to follow-up. In one patient with stage IV Ewing's sarcoma a metastasis occurred in a frontal bone after 2 years since treatment. The patient is receiving neoadjuvant chemotherapy to a positive effect.
In 3 patients, where the distance to the growth zone was from 0 to 1 cm, shortening of the limbs was observed and corrected.
Mean functional outcome of the subtotal resection of bone using autoclave-treated affected and vascularized fibula bones in children with malignant tumors on MSTS scale constituted 90.0 ± 8.5%.
Findings
Results of treatment of children with sarcoma bone defect using autoplasty of the defect with autoclave-treated and vascularized fibula bone with subtotal bone lesion to metaepiphysis area is comparable with the results of the use of large joint replacement.
It was established that resection at a distance of 1 cm from the edge of the tumor allows for the further course of the disease without local relapse.
A possible downside of the developed technique of surgical treatment is a longer period of rehabilitation.

Keywords : Bone tumor, metaepiphyseal resection, children
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Surgical management of bone single metastases of breast cancer: survival and quality of life.

Abstract ID : 1319
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Category : Others
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INTRODUCTION AND OBJECTIVES
Bone metastases are a common cause of decreased quality of life, as well as increased morbidity and mortality, especially in patients with breast cancer.
The aim of our study is to analyze the surgical treatment with curative intent in patients with breast cancer single bone metastases in our center.

MATERIALS /PATIENTS AND METHODS
A retrospective study of patients who received surgical treatment for breast cancer single bone metastases between years 2003/2014 was conducted.
Inclusion criteria were: PET/TC with single bone uptake, absence of visceral metastases and cancer control without progression (total nine patients).
The mean age at the time of diagnosis of metastases was 52.66 years. Mean follow-up after surgery was seven years and the time between the diagnosis of breast cancer and bone metastases was 2 years (0-15 years).

Six metastases were in spine, one in femur a two in pelvis (II and III Enneking´s Areas). Only four patients had pain at the time of diagnosis.

All patients were treated with curative surgery of the single bone metastases and subsequent reconstruction. Six corpectomy, two total hip replacements (after excision periacetabular area) and one excision of ischiopubic rami were performed. All patients were treated with chemotherapy and radiotherapy was added in six cases.

At the end of the study we evaluated survival, immediate postoperative complications and disease progression.

RESULTS
There were no major postoperative complications. All patients require blood transfusions and one case required surgical cleaning for a superficial infection. Survival 5 years after surgery was 88.9%, falling to 67% after 10 years. With PET/TC scan we checked six patients free of disease after five years, one had disease progression at three months (liver metastases), one at 18 months (new bone metastases) and another at 24 months (local recurrence).

CONCLUSION
Surgery with curative intent in unique breast cancer bone metastases, in select patients and in coordination with adjuvant treatment, appears to increase survival and improve morbidity and mortality.

Keywords : bone metastases, breast cancer, surgery
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Surgical navigation and desktop 3D printing in acral tumors.

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Submitted by : Calvo Jose A the 2016-02-14 14:25:22
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : No/Non

INTRODUCTION AND OBJECTIVES: Surgical navigation can improve the results in limb-sparing surgery. For reducing target registration error (TRE), a similar position of the limb must be ensured in the preoperative images and during image guided surgery (IGS). It is difficult in acral tumors because in distal extremities there are a lot of joints with very complex movements.
Patient-specific 3D printing templates and guides have been recently documented to improve the surgical planning and assist the surgeon during the procedure. Regarding desktop 3D printing applied to orthopedic surgery, have been documented good results in reconstructive pelvic surgery and techniques of lower-limb realignment. It is proposed to take one step further using a desktop 3D printer to design and create patient-specific distal extremity molds that ensure a similar position during imaging and IGS in the operating room (OR). The study evaluates the reproducibility of position during navigation using a distal extremity patient-specific 3D printed model.
METHODS: A patient with a soft-tissue sarcoma in the palm of his right hand is selected. A desktop 3D printed mold of the hand is done. The holder will lay on the surgical bed allowing the hand to remain in a fixed and known position. This holder is modeled extruding a patient's hand surface created from the segmentation of a previous CT scan used to plan the neoadjuvant external radiotherapy. Most of tools are open-source software, and the desktop 3D printer is a low-cost fused deposition modelling (FDM) hardware. The thermoplastic material is polylactic acid (PLA) because of its extrudability and nontoxic properties. Moreover, three screws for mounting optical passive markers are included in the layout to define a reference frame that would allow accounting for mold movements during navigation. The next step involves the surgical planning using DICOM CT and MR images of the distal extremity imported into the radiological post-processing software. A CT image of the rigid hand on its mold is acquired to resemble the patient's CT image. Navigation is performed with a multi-camera optical tracking system, that it is connected to 3D Slicer platform . The evaluation consists in placing the 3D printed hand on the mold, registering the conical holes (mold) of the CT (image space) with those corresponding ones obtained with a tracked pointer (physical space) and, finally, estimating the TRE between the conical holes (hand) in the image space and in the physical space. These steps are repeated four times.
RESULTS: The fiducial registration error (FRE) obtained from the conical holes in the mold and TRE from the conical holes in the printed hand for each repetition demonstrate the reproducibility of distal extremity position during navigation.

CONCLUSION: This study presents an IGS workflow for acral tumors that includes desktop 3D printing for reproducing distal extremity position. A multidisciplinary team of surgeons and engineers work together in the process of modelling and printing the patient-specific mold. This piece can be printed with a low-cost FDM printer at the hospital. These results allow to follow the preoperative planning during the surgical procedure.

Keywords : acral tumors, navigation, 3D printing, mold
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Surgical treatment of unicameral bone cysts in proximal humerus: Comparison between three treatment methods at two institutions

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Submitted by : Mavcic Blaz the 2016-02-14 15:21:16
Category : Others
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Authorisation to disclose : Yes/Oui

INTRODUCTION: Unicameral bone cysts (UBC) in proximal humerus can be treated with various methods and meta-analyses have shown similar overall treatment success rates for drainage screws versus curretage/spongioplasty. However, it is not clear which method requires lesser number of procedures to heal, has less complications and what is the added value of using elastic intramedullary nails (IM) in order to prevent subsequent pathological fractures. The aim of the presented retrospective case-control study was to compare the outcomes of three different unicameral bone cyst treatment methods (drainage screw, biopsy + elastic IM nail, curettage with optional spongioplasty) at two institutions (Medical University of Graz and University Medical Centre Ljubljana) in terms of the number of procedures needed to cure, number of postoperative fractures/recurrences/other complications and the final radiological outcome.

PATIENTS AND METHODS: Medical archives were screened for all patients who were surgically treated at Institution A (Medical University of Graz, time frame 1991-2015) or Institution B (University Medical Centre Ljubljana, time frame 2004-2015) with the histologically confirmed diagnosis of UBC in proximal humerus. Patients with surgical procedures in proximal humerus other than the three studied methods or follow-up <6 months were excluded from the study. For each patient we retrospectively obtained the data on gender, age, surgical procedures, fractures/complications/recurrences in the affected humerus and final radiological outcome (Capanna classification). All these parameters were compared between the three treatment groups with the Student t-test. Multivariate ordinal regression analyses were performed to find independent predictors of overall treatment success rate, number of procedures needed to cure and complications.

RESULTS: Out of the total number of 115 patients with surgically treated UBC, 99 met the inclusion criteria. Treatment methods were highly institution-dependent: 20 cases of curettage with optional spongioplasty (14 Institution A, 6 Institution B), 23 cases of drainage screws (all Institution B), 56 cases of biopsy + elastic IM nails (55 Institution A, 1 Institution B). Gender distribution was equal between the three studied groups. The mean age in patients with curettage (20.1 y) was significantly higher from the drainage screw group (10.9 y) and the elastic IM nail group (11.4 y) while the fracture rate at first presentation was considerably lower. The mean total number of procedures performed in patients with curretage (1.9) was significantly lower from the drainage screw group (2.5) and the elastic IM nail group (2.8). We observed the trend of slightly higher complication rates with nails and higher recurrence rates with drainage screws, but there was no difference between the three groups in fractures after first surgical treatment or Capanna radiological score at the final follow-up (mean 4.8 years).

CONCLUSION: Drainage screws and IM nails are mini-invasive methods of UBC treatment in pediatric patients with comparable results, but the patients and their parents should know such treatment usually involves at least 2-3 surgical procedures. Adding IM nails to proximal humerus does not affect the postoperative fracture rate and may cause additional complications while drainage screws have higher recurrence rates.

Keywords : Unicameral Bone Cyst; Drainage Screws; Elastic INtramedullary Nails; Curretage
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Surveillance for development of local recurrence after primary surgical excision of soft tissue sarcomas and borderline tumours of the extremities and trunk wall

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Submitted by : Thea Hovgaard the 2016-02-15 22:47:24
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Authorisation to disclose : Yes/Oui

Introduction and Objectives: The current routine follow-up policy for soft tissue sarcomas (STS) lacks evidence. There are few published data, no prospective studies and furthermore a lack of consensus between individual institutions. Early detection and surgical removal of a local recurrence is associated with improved survival. In January 2010, we introduced in our orthopaedic departments a new follow-up program for the first 2 postoperative years with the aim of identifying local recurrence after primary surgical excision of STS and borderline tumours of the extremities and trunk wall. In the new standardized surveillance program, the patients were examined 4 times a year: 2 times with clinical examination only and 2 times where the clinical examination was preceded by focal magnetic resonance imaging (MRI). The aim of this study was to evaluate the new surveillance program for identification of local recurrence.
Methods: We retrospectively assessed the medical files of all patients with STS (including borderline tumours) of the extremities and trunk wall who underwent primary surgery from January 1st 2010 to September 30th 2013 and had follow-up at the Department of Orthopaedic Surgery, Rigshospitalet, Copenhagen or Odense University Hospital. A total of 232 patients were included in the study (mean age 57 (18-88) years, F/M=117/115). From the medical files we extracted information on how local recurrence were detected during the first 25 months post-surgery. Statistics: Kaplan Meier survival analysis. 2x2 contingency table with chi2 test was used to compare the different diagnostic tests. P-value <0.05 is considered statistical significant.
Results:Twenty-five out of 232 patients experienced local recurrence within the first 25 months post-surgery corresponding to a 25 months local recurrence free rate of 92.2 %.
Compared to clinical examination (CE) local imaging examination, mainly MRI, (LI) led to a significantly larger amount of suspicions of local recurrence (37/557 versus 8/703, p<0.001). Furthermore the suspicions occurring on LI were more accurate than suspicions occurring on CE (17/37 affirmed versus 0/8 affirmed, p<0.015). Comparing the total number of examinations performed, LI found a significantly larger amount of local recurrences than CE did (17/557 (3%) versus 0/703 (0%), p<0.016). Thirty-three patients suspected local recurrence themselves, 8 of them were affirmed.
Conclusion: Our study shows that LI finds a significantly larger amount of local recurrence than CE compared to the amount of each examination performed. This leads to the conclusion that LI seems to be the most useful method in early detection of local recurrence in patients operated on for both high- and low-malignant STS. This suggests that a biannual LI (mostly MRI) the initial 2 postoperative years, will detect local recurrence better than CE and therefor render regular CE between theses MRIs unnecessary, but patients´ own suspicion of local recurrence is still important.

Keywords : Follow-up, local recurrence, surveillance
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Surveillance for development of lung metastases after primary surgical excision of soft tissue sarcomas of the extremities and trunk wall

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Submitted by : Thea Hovgaard the 2016-02-15 22:54:17
Category : Others
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Introduction and objectives
The current routine surveillance policy for soft tissue sarcomas (STS) lacks evidence with only few published data, no prospective studies and further more a lack of consensus between individual institutions. Early detection and surgical removal of lung metastases is associated with improved survival. In January 2010 we changed our lung metastases surveillance program for intermediate- and high-grade STS the first 2 years post-surgery from plain chest X-ray 4 times a year to a program still with 4 examinations a year, but with alternation between low-dose chest CT-scan (without contrast) and plain chest X-ray. The aim of this study was to evaluate the new lung metastases surveillance program.

Material/patients and methods
We retrospectively assessed the files of all patients with intermediate- and high-malignant STS (Trojani grade II and III) of the extremities and trunk wall, who underwent primary surgery from January 1st 2010 to September 30th 2013. Only patients who had follow-up at Rigshospitalet, Copenhagen or Odense University Hospital were included in the study: 116 patients were included in the study (mean age 59 (18-87) years, F/M=57/59). Outpatient contacts the first 25 months post-surgery were reviewed in order to examine how lung metastases were detected. Statistics: Kaplan Meier survival analysis. 2x2 contingency table with chi2 test was used to compare the different diagnostic tests. P-value <0.05 is considered statistical significant.

Results
Nineteen out of 116 patients experienced lung metastases within the first 25 months post-surgery corresponding to a 2-years (25 month) metastases free rate of 87.1 %. Compared to X-ray, CT-scans led to a significantly larger amount of suspicions of lung metastases (23/285 versus 6/278, ($p<0.002$)). Furthermore the suspicions occurring on CT-scan seemed to be more accurate than suspicions occurring on X-ray (16/23 affirmed versus 2/6 affirmed, ($p<0.103$)). The only cases where an X-ray finding of lung metastases was correct were in 2 cases where an X-ray was the first chest examination after surgery and radiotherapy. One suspicion on CT-scan were neither affirmed nor denied because of loss to follow-up. Three patients suspected lung metastases themselves and 1 of them was affirmed. Comparing the total number of examinations performed, CT-scans found a larger amount of lung metastases than X-ray examinations did (16/285 (5.6%) versus 2/278 (0.7%), $p<0.001$).

Conclusion
Our study shows that CT-scans identified a significantly larger amount of real lung metastases compared to plain X-rays in our new lung metastases surveillance program. This leads to the conclusion that CT-scans seems to be the most useful method for early detection of lung metastases in patients operated on for STS. This suggest that a surveillance program with biannual CT-scans of the chest during the first 2 postoperative years, will detect the majority of lung metastases, and therefore render regular chest X-rays between these CT-scans unnecessary.

Keywords : Follow-up, lung metastases, surveillance
Authors :
References : , , ,

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SYNCHRONOUS TUMORS: ¿WHERE DO I START?

Abstract ID : 1178
Submitted by : IRENE LÓPEZ TORRES the 2016-02-10 10:37:55
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION
The presence of multiple malignant primary tumors on the same subject is a rare finding. We report the case of a 72 year old male with three synchronous primary tumors with different histological diagnosis.
The aim of this report is to expose the diagnostic and therapeutic peculiarities of sarcomas when they are diagnosed synchronously with one or more primary tumors.

MATERIAL AND METHODS
We report a case of a 72 year old male with clinical history of chronic hepatitis C virus that, during the routine screening, shows four liver lesions that suggest a stage A hepatocellular carcinoma. During the extension study, another lesion compatible with primary pulmonary neoplasia was identified in the left upper lung lobe. The study was completed with PET-CT, confirming the existence of a primary bronchogenic carcinoma as well as a hypermetabolic area in the left iliopsoas muscle.

RESULTS
Given the results of the imaging tests, the differential diagnosis of the iliopsoas hypermetabolic area was between metastatic affection and another primary tumor. The FNA of psoas was done, and we obtain an histological result of primary epithelioid sclerosing fibrosarcoma FNCLCC grade 2.
The presence of three synchronous primary tumors requires a multidisciplinary approach, so this case was presented in the Tumor Comittee where the global therapeutic strategy was established. The four hepatocellular lesions were treated with radiofrequency ablation while surgery was required for lung and psoas neoplasms. Psoas fibrosarcoma was treated through surgical removal in association with intraoperative radiotherapy. The lung epidermoid carcinoma was treated with upper lobe segmentectomy.

CONCLUSSION
Every malignant lesion diagnosis must be followed by an extension study. The current report proves that in spite of the identification of a primary tumor with well-known histology we must not forget the posibility of finding other lesions. Furthermore, incidental findings during the extension study are common and force to complete the study with new image or histological tests.
The therapeutic approach of synchronous tumors should be the treatment of each separately, but the treatment of one of them should not interfere with the treatment of others. Therefore, the treatment of every tumor needs a multidisciplinary approach suitable to the staging of each one.

Keywords : sarcoma, synchronous
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References : , , ,

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The “IlluminOss fluid nail” in intramedullary stabilization of the humerus: preliminary experience

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Submitted by : Carmine Zoccali the 2016-02-09 09:53:17
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: metastases of the humerus are very commune lesions. They are usually treated conservatively: immobilization and radiotherapy are often sufficient because of the humerus das not have to support weight baring. Nevertheless, when the osteolysis is important surgery could be advisable to decrease the risk of fracture. Intramedullary nailing is considered the mainstay treatment for radiosensitive metastasis but unfortunately the presence of an electron dense material interferes with successive radiotherapy and with its effectiveness.
The IlluminOss system consists in an intramedullary stabilization with a nailing system made filled of a fluid monomer that exposed to UV polymerizes becoming harder, so that it can be drilled and locked with screws. We present the preliminary experience in treating fractures and impending fractures with this system.

Patients and methods: from October 2014 to January 2015, four patients, three males and one female, underwent intramedullary stabilization with IlluminOss system for metastatic osteolysis of the humerus.
The average age was 69,9 years (62-77); three out of four were affected by multiple myeloma, the last one by metastases of breast cancer (male, 77 y.o.). Lesions were located at the proximal metaphysis in two cases, at the central diaphysis in one case and at the distal diaphyseal third in one case.

Results: all surgeries were performed without problems and complications; a screw was used to lock the nail in meta-diaphyseal lesions. Three out four patient completed adjuvant radiotherapy with a good consolidation/ossification; in the last performed case radiotherapy is ongoing.

Discussion: intramedullary stabilization is the mainstay treatment in metastatic patient for impending or already occurred fractures. Several nails are commercially available but the most of them gives artifacts at CT scan interfering with adjuvant chemotherapy. The presenting system is characterized by a low artifacts level allowing a safer postoperative treatment. Moreover it is inserted in a fluid status so that the access is minimally invasive and less obliged than that of traditional nails; it better adapts to the intramedullary shape of the bone even it those case were a deformity is present.

Conclusion: the IlluminOss intramedullary stabilization system could be considered a good method for treating osteolisis of the humerus. More studies with more numerous series are necessary to verify the effective advantages for the patients and possible problems in case of removal.

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The Bionic Human Arm – fact or fiction in 2016?

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Submitted by : Örjan Berlin the 2016-02-09 20:41:50
Category : Others
Typology : Poster
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Introduction: The concept of bone-anchored amputation prostheses includes introducing a fixture into the remaining skeleton, and after 6 months attaching an abutment allowing it to penetrate the skin and connect an external prosthesis onto it. Two of us (M.O. and R.B.) have developed a technique picking up neural signals from the remaining muscles and nerves and leading them through the abutment into an external motorized prosthesis thus considerably improving the functional outcome for the patient. The signals are both afferent and efferent thus allowing the patient fine-tuned motoric and sensory functions hence making it brain-controlled in a bidirectional fashion.
Method: In January 2013 the first transhumeral amputee was operated upon with this new technique. Electrodes were placed on nerves and muscles, and their leads led through the bone anchored components to a motorized external prosthesis. The patient was fitted with such a prosthesis three weeks after surgery and has used it in all activities of daily living since then. Objective measurements has continuously been registered regarding prosthetic control, prosthetic use and global quality of life.
Results: The patients functional improvement has considerably increased as compared with his previously used conventional myoelectric prosthesis. The patient has returned fully to work as a truck driver. Video presentations of his functional status will be presented as proof of his improvement. Prosthetic control, prosthetic use and global quality of life were all significantly improved. More than 3 years after the surgery the functional aspects of the system is still fully functional.
Conclusion: This procedure is still clinically experimental, but seems to have considerable functional advantages compared with ordinary myoelectric upper-arm prostheses.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/bionic-composite-pict.png, http://sites.altilab.com/files/122/abstracts/bionic-composite-pict.pdf
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The COMPRESS® endoprosthesis is a viable option in the treatment of upper extremity tumors, failed arthroplasty and massive post-traumatic bone loss

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Submitted by : Krista Goulding the 2016-02-22 04:19:16
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Typology : Poster
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Authorisation to disclose : Yes/Oui

Introduction and objectives: The surgical management of massive bone loss in the upper extremity stemming from primary or secondary malignancy, failed arthroplasty or post-traumatic disorders is a challenge, and can lead to significant morbidity for patients. We assessed, 1) implant survival of the Compress® (CPS) (Biomet Inc, Warsaw, IN, USA) endoprosthesis, 2) modes of failure, and 3) functional outcome scores in order to ascertain whether this device is a feasible option for massive bone loss in the upper extremity necessitating endoprosthetic replacement.

Methods: A multi-institutional retrospective review identified 9 patients (5 females; 4 males) who underwent 12 endoprosthetic replacements using the CPS in the upper extremity. The mean patient age was 45.4 years (range, 21 to 62). Four CPS were implanted in the proximal humerus, 1 in the humeral diaphysis, 5 in the distal humerus, and 2 in the proximal ulna. Five of 10 patients had an initial diagnosis of sarcoma (2 osteosarcoma, 1 Ewing's sarcoma, 2 sarcoma NOS). Seven patients had the CPS implanted in the setting of revision surgery; 2 patients had primary surgery (1 humeral diaphysis; 1 proximal humerus). Two sarcoma patients had multiply revised, failed allograft prosthetic composites, 5 patients had failed arthroplasties (4 infection; 2 aseptic loosening) and 1 patient had massive bone loss in the setting of an open fracture. No patients were lost to follow-up. Mean follow-up was 50 months (range, 8 to 141). Range of motion, visual analog scale, and MSTS score were collected so as to establish the impact on function.

Results: Three patients required revision of their CPS implant. All failures were successfully revised to another CPS implant. No failures involved the bone implant interface, and there were no periprosthetic fractures. Mechanical failure of the CPS occurred in 2 patients. One patient with a distal humeral CPS required implantation of a custom proximal ulnar CPS after catastrophic failure of the standard ulnar component. The CPS ulnar implant was also successfully revised after mechanical failure at the polyethylene articulation. One patient with a proximal humeral CPS underwent a two-stage revision for recurrent instability, skin erosion and infection. A glenoid component was required, as was a free soft tissue flap for implant coverage. Other surgical complications included a transient radial nerve palsy that resolved spontaneously at 9 months, inferior subluxation of the glenohumeral joint that did not require revision, infection which was successfully salvaged with irrigation, debridement and implant retention at 3 years post-operatively, and an ulnar nerve sensory neuropathy.
Mean shoulder flexion was 20 degrees for proximal humeral implants, and elbow motion ranged from 8 to 115 degrees. The mean visual analog scale was 4.8 and the mean MSTS score for patients with sarcoma was 26. There were no incidences of local recurrence or amputation. All patients remain alive without evidence of disease.

Conclusions: The CPS implant is a safe option for revision surgery of massive bone loss in the upper extremity. Long-term follow-up is necessary to document the survivorship of these implants in the upper extremity.

Keywords : COMPRESS; upper extremity; sarcoma; osteointegration; endoprosthetic reconstruction
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The effect of chemotherapy on osteointegration and loosening of distal femoral replacements

Abstract ID : 1209
Submitted by : Aadil Mumith the 2016-02-11 17:23:53
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives

Limb salvage surgery utilising endoprostheses is the gold standard treatment for the management of primary bone tumours. Improvements in chemotherapy have allowed patients to have longer life expectancies than ever before. Survivorship of the implant must be improved to avoid revision surgery and its associated risks. The major cause of endoprosthetic failure is aseptic loosening and current literature has shown a relationship between osteointegration of the ingrowth collar and survivorship of the implant with bone growth around the collar thought to be optimal at approximately 18 months postoperatively.
Cytotoxic chemotherapy is known to have effects on bone growth. Here we evaluate the effect of chemotherapy on the osteointegration of ingrowth collars and loosening of implants.

Materials/Patients and Methods

We have completed a retrospective study of adult patients with distal femoral replacements (DFR). Patients who underwent surgery for non-oncological indications, receiving radiotherapy, rheumatoid patients, infected prostheses and secondary bone tumours were excluded. Post-operative radiographs at 1, 2 and 3 years were analysed and those patients without radiographs at these timepoints were also excluded. Bone growth around the collar was quantified by analysing the size of the bone pedicle growing from the transection site. Osteointegration was evaluated by calculating the percentage of the collar surface with direct bone pedicle attachment. Loosening was measured using the 'Radiolucent Line Score' (RLL). As a result our two cohorts included patients with primary bone tumours who have received adjuvant and neo-adjuvant chemotherapy (n=15) and patients with primary bone tumours who have not received chemotherapy (n=18). Shapiro-Wilk test was used to test data for normality. Mann-Whitney U and Kruskal-Wallis tests were used to analyse non-parametric data with a $p\text{-value}<0.05$ seen to be significant.

Results

There was no difference in the age (chemotherapy 31(19-50) years Vs non-chemotherapy 35(29-44) years, $p=0.0395$) and gender ($p=0.566$) profile between the groups. The chemotherapy cohort consisted of 9 osteosarcomas, 1 Ewing's sarcoma, 3 spindle cell sarcomas and 2 high grade malignant fibrous histiocytomas. All cases within the non-chemotherapy cohort where of giant cell tumours. No difference was observed in bone growth around the collar from the transection site between the groups. Greater osteointegration of the ingrowth collar was observed in patients not receiving chemotherapy compared to those undergoing chemotherapy at 3 years ($p=0.021$). A greater gap was seen between the shoulder of the implant and cortical bone in the chemotherapy group at 3 years ($p=0.024$). Chemotherapy patients exhibited greater loosening of the intramedullary stem at 3 years ($p=0.041$) as well as a deterioration in loosening with time ($p=0.009$). No statistically significant change in loosening was seen in the non-chemotherapy group over the 3 year period.

Conclusion

We have identified that patients with DFRs receiving chemotherapy have less osteointegration and greater loosening when compared to patients not receiving any chemotherapy within the first 3-year postoperative period. We feel that further modifications to the collar design must be made in order to improve the discrepancy in implant osteointegration and loosening between patient subgroups.

Keywords :
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The Epidemiology Of Adamantinoma: An Analysis of Data From The Surveillance, Epidemiology And End Results Program (SEER; 1973-2012)

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Category : Others
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Introduction: Adamantinoma are a low-grade malignant epithelial neoplasm that typically occur in mid-portion of the tibia. There also have been reported cases of these tumors occuring in the fibula as well as simultaneously in the tibia and fibula. They are a rare neoplasm, comprising only 0.1–0.5% of all primary bone tumors. Histologically, adamantinoma have a stromal component, with a fibrous dysplasia-like appearance. The tumor typically appears as a multi-locular or slightly expansile osteolytic cortical lesion on plain radiographs and CT scans.

There have been numerous case reports involving adamantinomas. This study is the first to analyze the epidemiology and comprehensive population-based description of adamantinoma.

Materials and Methods: This was a retrospective cohort study served by the National Cancer Institute's population-based Surveillance, Epidemiology and End Result (SEER) program. In total, 71 cases of patients with adamantinoma were recorded within the SEER registry between 1973 and 1012.

Results: Approximately 78.9% (56) of the 71 patients survived at least five years. Highest adamantinoma incidence were seen in the 10-29 age group (46.5%), while only five (7.0%) of the patients were in the 60-79 age group. 56.3% of the patients were male and 74.6% were white. Black and Asian patients were both 11.3%. Average age of diagnosis of white patients were 33.6 years while Black and Asian patients were diagnosed at an average age of 29.5 years and 25.5 years, respectively.

Even though California represents 12.2% of the US population, 33.8% of the patients diagnosed were residing in California (2). 94.4% received only surgery as treatment, while one patient (1.4%) received surgery followed by radiation. Most adamantinomas were diagnosed when the tumor was between 50-100mm. Most cases were invasive and confined to the cortex. Eight cases extended beyond the periosteum to surrounding tissues. No tumor extended into the lymph nodes. All cases were in the lower limb except for one patient who was diagnosed with the tumor in the upper limb.

Conclusion: This comprehensive, population-based description of adamantinoma identified important differences in age groups, anatomic site, race, extension, size, and lymph node involvement. These findings may help provide a better understanding of adamantinoma epidemiology and treatment.

Keywords : Adamantinoma, SEER program, bone cancer, epidemiology, incidence
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Supplementary material : http://sites.altilab.com/files/122/abstracts/picture1.jpg, http://sites.altilab.com/
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The importanceof P53-suppressor gene in prognosis of osteosarcoma

Abstract ID : 1266
Submitted by : Otabek Abdurakhmonov the 2016-02-14 06:28:13
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim. Study the influence of indicators P53 on the course and prognosis of osteosarcoma.
Material and methods. 221 patients with osteogenic sarcoma of bones were observed on presence of P53 mutant gene. The age of patients, varied from 18 to 35 years. The number of men was 133 (60.1%), women - 88 (39.8%). The localization of tumor was follow: in 102 (46.1%) patients the tumor was in femoral bone, in 83 (37.5%) patients – in tibialis, in 16 (7.2%) patients – in fibula, in 6 (2.7%) patients - humerus, in 11 (4.9%) patients – in the beam part and 5 (2.3%) patients had in iliac bone. In order to determine the performance-suppressing gene p53 in tumor cells of osteosarcoma, all the patients were examined by immunohistochemical studies. Immunohistochemical studies were performed on sections from the paraffin blocks which the size of thickness was 3-4 microns by methods of ovidin-baetin-peroxidase with using primary antibodies («Dako:» NOVOCASTRATm). A positive outcome was the presence of a specific high-intensity staining of more than 10% of the nuclei in the identification of the mutated gene suppressor mtp53.
Results.The results of the study shown that, the expression and over expression mpt53+ in patients with osteosarcoma in low grade tumors (G3) occurred 13 times more often than the rate of a gene with a high (G1). In III-IV clinical stages, the rate of over expression was higher 4 times than stages I-II (70.5% and 85.7% compared with 20.0% and 47.8%).The positive expression of mpt 53 occurred 1.5 times more frequently when tumor volume of more than 500 cm3 while in patients with <260 cm3 the positive expression rate is low. The high expression of gene suppression mpt 53 was observed in adverse histological forms (chondroblast and radiographic osteolytic form). I and II degree of pathomorphism occurred 2.6 times more often in patients with positive expression of a gene mpt 53+ while III- IV degrees occurred 2,9 times more frequent in patients without this mutation.The patients with gene expression mpt 53 regardless of the therapy had reduction terms of relapse, distant metastasis and survival rate.
Conclusion. Definitions of gene suppression mpt 53 is important in the course of prognosis in osteosarcoma.

Keywords : 2297753
Authors :
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The influence of clinical, pathological and treatment related factors on the prognosis of patients with synovial sarcoma.

Abstract ID : 1075
Submitted by : Maria Anna Smolle the 2016-01-19 10:26:57
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction

The SSX-SS18 fusion gene is characteristic for synovial sarcoma. This subtype of soft tissue sarcoma is relatively rare and predominantly diagnosed in adolescents and young adults. Treatment consists of wide resection and – based on the patient's individual condition – subsequent radio- and/or chemotherapy.
The aim of this study was to validate the influence of different clinical, pathological and treatment-related factors on the outcome of patients with synovial sarcoma.

Materials/Patients and Methods

Within a 33-year period lasting from 1982 till 2014, 341 patients with a histolgically confirmed synovial sarcoma were treated at our institution. The mean patient's age was 36.8 years (range: 2 – 83 years), with equal gender distribution.

Results

In our cohort, 53 patients were of paediatric age. 97 patients were referred following an unplanned excision ("whoops"-procedure). The median duration of symptoms was 1 year (IQR: 2.6 years; 95% CI: 2.2 – 3.3 years). Patients with an inadvertend resection had a significantly longer duration of symptoms (4.1 years vs. 2.1 years; p=0.001). The average tumour size was 7.2 cm (95% CI: 6.6 – 7.8 cm). Mean follow-up was 5.2 years (range: 1 – 22 years), with a 5-year survival rate of 66.9%. Adult age and large tumour size were significantly associated with an impaired prognosis. In multivariate analysis, the tumour size only remained a significant independent prognostic factor.

Conclusion

Synovial sarcoma patients with unplanned excisions reported a significantly longer duration of symptoms than directly referred patients. Large tumour size was the only independent negative prognostic factor regarding overall-survival.

Keywords : Synovial Sarcoma, Prognostic Factors
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The isolated perfusion or amputation in patients with locally advanced soft tissue sarcomas of the extremities?

Abstract ID : 1204
Submitted by : Nikolay Petrochenko the 2016-02-11 14:47:49
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objective: To compare the results of treatment in patients with soft tissue sarcomas of extremities using the method of isolated limb perfusion and amputation.

Materials and Methods: 48 patients with locally advanced soft tissue sarcomas of the extremities were treated in Russian Cancer Research Center since 2012 till 2016. In the first group there were 22 patients who underwent isolated limb perfusion. Gender distribution: women - 15 (68%), men - 7 (32%). Median age was 49 ± 16.7 years, range from 21 to 79 years. Patients were treated using isolated perfusion according to standard scheme on femoral (n = 14) and axillary (n = 8) levels. The second group (26 patients) was underwent amputation. Gender distribution: women - 14 (54%), men - 12 (46%). Median age was 47 ± 14.3 years, range from 23 to 71 years. Chemotherapy leakage into the systemic circulation was less than 6% (usually 0.5 - 2%). Perfusion was performed with medium hyperthermia. Local toxicity was assessed with Wieberdink scale. Systemic toxicity level was assessed with NCI-CTC.

Results: In our study, the level of local toxicity was not raised above the level 2 on Wiberdink scale. No cases of systemic toxicity were determined. Median follow-up for all 48 patients was 21 months (range from 1 to 57 months). In the first group (patient were treated using isolated perfusion) the overall response was revealed in 18 patients (81.8%), a complete response - in 4 patients (18.1%), partial response - in 14 patients (63.6%), there was no answer - 4 patients. Limb salvage in patients of the first group was 76.5%. Overall 2-years survival after perfusion was 90.5%. At the same time, the overall 2-years survival rate in patients after amputation (the second group) was 75.5%.
Conclusion: The method of isolated limb perfusion improves not only patients quality of life but also 2-year survival indices.

Keywords : soft tissue sarcoma, isolated perfusion
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/-emsos-2016-english.docx, http://sites.altilab.com/
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The kyphoplasty in the treatment of tumor disease of the spine

Abstract ID : 1318
Submitted by : Maria Gaudiosa Puerto Vazquez the 2016-02-15 14:44:51
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

INTRODUCTION AND OBJECTIVES
Vertebral fractures in oncology patients cause significant pain and disability, with decreased quality of life. The aim of the study is to assess the efficacy and safety of kyphoplasty in this type of vertebral fracture in the acute phase.

MATERIALS /PATIENTS AND METHODS
A retrospective study was conducted on 75 consecutive oncology patients with 122 acute vertebral fractures, who underwent bilateral balloon kyphoplasty, with a mean follow up of 11 months.

RESULTS
Almost all (91%) of the patients improved their pain level. The mean improvement in the Visual Analogue Scale (VAS) was 4.28 points (preoperative value 7.49 [SD 1.19], postoperative 3.21 [SD 0.95]). Before surgery, 53% of patients needed major opioids (40 cases), and one month after surgery only 12% (9 patients) required them.
Quality of life determined by the Karnofsky index improved from 60.2 (SD 10) to 80.7 (SD 12.1). Cement leaks were found in 5.7% (7 cases), all without neurological repercussions. New fractures appeared in 11 patients. This subgroup showed a slight worsening of the initially acquired clinical improvement. No neurological or pulmonary complications related to surgical technique were found.

CONCLUSIONS
Kyphoplasty is an effective and safe for treating vertebral fractures in patients with cancer.

Keywords : Vertebral fractures , oncology patients, kyphoplasty
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The long-term results of treatment osteogenic sarcoma depending on genetic markers.

Abstract ID : 1268
Submitted by : Otabek Abdurakhmonov the 2016-02-14 06:44:53
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim. Study the survival rate of patients with osteosarcoma, depending on the genetic markers.
Material and methods. 228 patients with osteosarcoma were observed. The long-term resultswere studiedwith definitionof 3- and 5-year survival rate by Kaplan-Meier, depending on the expression of genetic markers. Therefore, it is necessary to take into account these indicators in ordinary tactics of treatment and prognosis of disease.The genetic expression in tumor cells is determinated by the method of immunohistochemistry.
Results of the study. The 3- and 5-years survival rates composed - 82,4±0,9% and 5,9±0,5% when chromosomal aberrations above the level of discrimination (more than 5%) while the level of chromosomal aberrations less than 5% the 3- and 5-years survival rates composed 92,5±0,2% and 36,2±0,5% ($p<0.05$). The 3 and 5-years survival rates compiled - 71,4±0,8 and 3,6±0,3%at high expression of suppressor gene P53, whereas in the absence of expression the rates were- 97,4±0,1%, and 44,2±0,5% ($p <0.05$), respectively. The 3 and 5-years survival rates were high when Bcl2 expression - 94,7±0,2% and 41,3±0,5% while this gene was absence the figures were - 78,6±0,7% and 7,1±0,4% ($p<0.05$). High expression of Ki67 has a poor prognosis with a 3-and 5-years survival rates, it is composed - 77,1±0,7% and 11,4±0,5%, whereas the rates changed to - 97,1±0,2% and 44,3±0,5% ($p<0.05$) in the absence of expression. When the indicator of VEGF-A up to 450 pg/ml the 3-and 5-year survival rate composed 81,2±1,6% and 68,8±3,1%, while the indicator of VEGF-A more than 450 pg/ml values were lower - 56,0±0,5% and 11,1±0,7% ($p <0.05$).
Conclusion.The expression of chromosomal aberrations and genetic markers have main role in the definition of survival rate and prognosis of the disease.

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The modularal Italian Megaprosthesis R.O.M.A.-Lepine for reconstruction after resection of tumors located in the proximal femur: multicentric preliminary experience

Abstract ID : 1054
Submitted by : Carmine Zoccali the 2016-01-09 14:08:52
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: proximal femur is a frequent site for primitive e secondary tumors. For primitive bone tumors the mainstay of treatment is wide resection and reconstruction with a mega-prosthesis; for secondary tumors we can identify the previous reported treatment and the endomedullary locked nail. The choice depends on several factors as the histology, the site of metastasis, the time from the extirpation of the primary tumor, the life expectance and the presence of other effective therapies. Because of the improvement of survival, resection and reconstruction with mega-prosthesis is more and more widespread. We report the preliminary results of a new prosthesis particularly adapted for metastatic patients but also applicable in primitive tumors.

Patients and methods: from February 2013 to January 2015, 43 patients underwent surgeries for tumors located at the proximal or medial third of the femur. The cohort was composed by 20 males and 23 females with a median age of 65,5 years (min 41-max 82). Ten out of 43 patients were affected by primitive tumors, the remaining part by metastases; chondrosarcoma was the most frequent primitive tumor (4 out of 10) whereas breast cancer was the most frequent origin of metastasis (13 out of 32).
Indications for surgery were in 20 cases pathological fracture (whereof 3 cases of rupture of a previous inserted intramedullary nail), in 11 cases impending fractures whereas in 12 cases indication was oncological.
A further group with the same epidemiological and clinical characteristics where other prosthetic reconstruction systems were used was build for comparison.
The prosthesis was chosen looking for a system able to reconstruct the femur even after minimal resection and able to stabilize with an endomedullary stem the most of the segment.
Inpatient time, complications and residual function after six months from surgeries were considered primary endpoints.

Results: no statistical differences were found in the results of the two different groups.

Discussion: the ROMA prosthesis is an efficient system for reconstruction after resection of tumors located in the proximal femur. It is easy to implant and, to our knowledge, it is the only which allow to perform little reconstruction (the lesser hap is 30mm of height) and to stabilize the entire femur because the intramedullary stem measures from 140 to 240.

Conclusion: The Roma prosthesis can be considered a valid alternative for reconstruction after resection of tumors located in the proximal third of the femur. The cost of quite the half of the other prosthesis commercially available suggests that it can be particularly suitable also from an economic point of view. The proximal availability of hap of 200mm of length and a stem of 300 will increase indications.

Keywords : Metastasis; resection; proximal femur; prosthesis, hip, reconstruction
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-emsos-lepine-2.docx, http://sites.altilab.com/
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The role and timing of surgery and radiotherapy in Ewing Sarcoma of the pelvis

Abstract ID : 1183
Submitted by : Eleonora Marini the 2016-02-10 14:04:49
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Background:

Ewing Sarcoma (ES) is a rare malignant bone tumor, usually affecting adolescents and young adults. Pelvic localization (26%) characteristics are: challenging diagnosis, greater tumor volume, poor response to chemotherapy and biological aggressiveness. Therapy is based on neo-adjuvant chemotherapy, local treatment (surgery/radiotherapy) and target adjuvant chemotherapy based on tumor necrosis.

Purposes:

Purpose of this study was to assess the following:

– Timing of surgery and radiotherapy as local treatments
– Survival rate in patients treated with multimodal local therapies; local and systemic recurrence rate; complications rate and functional outcome

Materials and methods:

Thirty patients (21 male and 9 female) treated for ES of the pelvis (2000-2015) were retrospectively reviewed.
Median age was 16 years (range 5–30); 18 patients (60%) were classified as stage IIB and 12 patients (40%) as stage III. Median follow-up was 65 months (range 2-177).
All patients received chemotherapy according to ISG/SSG and ISG/AIEOP protocols.
Patients were divided into groups according to local treatment algorithm: 11 patients (group D) treated with radiotherapy (RT); 19 patients treated with surgery: 6 (group A) before RT, 10 (group B) after RT and 3 (group C) with surgery alone.
Median radiation dose was 52 Gy.
Functional outcome was evaluated with MSTS score. Overall survival and event-free survival (OS and EFS) were assessed using Kaplan-Meier method.

Results:

OS and EFS were 100% and 60% for group A; 77,8% and 80% for group B; 62% and 75 % for group C; 66,7% and 66,7% for group D. At last follow-up 16 patients (53,3%) were NED, 6 patients (20%) were AWD and 8 patients (26,7%) were DOD. Median MSTS score was 23 (range 12-30); surgical complications rate was 26,7%: infection, wound dehiscence and neurological injury were the most frequent complications.

Conclusions:

Surgery has demonstrated to be the best local treatment for stage IIB and III patients in terms of OS and EFS. Complication rate was lower in patients treated with radiotherapy after surgery. Larger series of patients are needed to confirm our findings.

Keywords : Ewing Sarcoma, pelvis, surgery, radiotherapy
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The type of surgical treatment in giant cell tumor of the femoral bone

Abstract ID : 1265
Submitted by : Otabek Abdurakhmonov the 2016-02-14 06:16:22
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Aim. Improving the results of treatment in giant cell tumor of the femoral bone by using bone-plastic operations.
Material and methods. 78 patients with giant-cell tumor of the femoral bone was produced various kinds of bone-plastic operations. From all of them the number of men was 41 (52.5%) and women - 37 (47.5%). The age of patients vary from 14 to 60 years. The localization of tumors were follow: in 42 patients (53.8%) it was in right femoral bone and in 36 patients (46.2%) - in the left femur.1 patient (2.5%) had tumor in meta-diaphyseal part of femoral bone. 45 patients (57.8%) had tumor in epi-metaphyseal part of femoral bone, 29 patients (37.2%) had in proximal part of femur and 1 patient had in (2.5%) in diaphysial section of femur. In histological study of 78 patients, 7 (9%) patients had malignant tumor and 71 (91%) - benign giant-cell tumor. All patients were examined by clinical and radiography, ultrasound, CT, MR-image and MSCT. The morphological verification of diagnosis was achieved by using cytological and histological examination. In comprehensive examination, the sizes of lesion bone vary from 5 to 13 cm. 4 patients (5.1%) had pathological bone fracture. The soft tissues were not damage. The volume and type of surgery depend on the size of the lesion, the state of cortical layer and soft tissue, histological structure and radiological types of the tumor. It should be noted, that majority of patients (95%) had radiographically trabecular or cellular-mixed form of tumor. The patients were divided into 4 groups depending on the options for surgical treatment: 1st group - excochleation and autoplasty 23 (29.5%) patients, 2nd group includes 25 (32%) patients with excochleation and cement-plastic, 3rd. - excochleation, autoplasty and cement-plastic - 11 (14.1%) patients and last group includes 19 (24.4%) patients with excochleation, cryotherapy and cement-plastic.
Results. Patients were observed from 6 months to 10 years. During the period from 6 to 24 months, the tumor recurrence was revealed in 1st groups – in 7 (30.4%) patients, in 2nd group - 3 (12%) , in 3rd group - 2 (18.2%) and in last group - 1 (5.3%) patient. Two patients had distant metastases in the lungs.
Conclusion. Results of the study shown that, the using of cryotherapy and medical bone cement is the choice of treatment in giant cell tumors of long bones and improves long-term results of surgical treatment.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/akmal-aka-2-eng.docx, http://sites.altilab.com/
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The use of neo adjuvant Chemotherapy (Danusumab) In joint/limb salvage of high grade GCT of distal radius

Abstract ID : 1511
Submitted by : Thomas Cosker the 2016-02-22 23:54:12
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

GCT's of bone are known to have high local recurrence rates following treatment leading to the development of a number of adjuvant and neo adjuvant agents to optimise outcome. Denosumab is one such well known drug approved for use in unresectable GCT's as well as in lesions which necessitate debilitating surgery. Its use as a neo adjuvant agent with regards to optimum dose, duration is less well known and we present the preliminary findings with regard to these parameters.
Objective- To ascertain the optimal dose, and duration of treatment in patients undergoing curettage of distal radius GCTs in an attempt to salvage the native joint.
Methods-
All Patients with advanced GCT of the distal radius who received neo adjuvant Denosumab were included. The dose and duration of treatment, intraoperative findings, post operative course were recorded and correlated. Patients wrist function at last follow up was assessed using the TESS and DASH scores.
Findings/results
We present our findings which are a mixture of success and important lessons. Several cases proved very challenging following a prolonged period on Denosumab and one case where a bone substitute was used with very poor results will also be prevented. There are several more successful cases but this has been a learning journey.
Conclusions
The use of Denosumab for a short period of 6-12 weeks prior to surgery resulted in good peripheral consolidation of the tumour allowing for thorough intralesional curettage without breaching the bony cortex. Following filling of the curetted defect with cement, the peripheral rim of Denosumab treated GCT appeared to remodel well and allowed a very good functional outcome over the period of study.

Keywords : GCT, Denosumab
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Therapeutic Education for Adolescents and Young Adults patients with Sarcoma: the French “Go-AJA” working group experience.

Abstract ID : 1231
Submitted by : Nadège CORRADINI the 2016-02-12 14:21:07
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Over the past fifteen years, the need for special cares for adolescents and young adults (AYA) living with cancer has made itself felt. Every year in France, about 1900 adolescents (15-19 years old) and young adults (20-24 years old) are diagnosed with cancer .
Bone and soft tissue sarcomas are the second most frequent cancer observed in AYA1, and the survival rates for these patients are lower when compared with children’s results. A hypothesis put forward to explain this difference is a lack of constancy in care and AYA non-compliance to treatment.
Therapeutic Education (TE) is a practice developed to strengthen skills of people with chronic illness. The lengthening survival time of cancer patients as well as changes in the patient-caregiver relationship contribute to the development of TE in cancer.
“Go-AJA”, an interdisciplinary national organization established in 2012, aims to improve the quality of cares and treatment results for AYA with cancers. The active TE working group of “Go-AJA” intends to elaborate TE programs by skilled multidisciplinary teams engaged in interactive educational actions.
Materials/patients and methods
The TE “Go-AJA” working group has federated pediatric and adult oncologists, nurses, psychologists, TE professionals, and resource patients. In order to focus on patients with sarcomas, an experienced bone sarcoma researcher joined the group.
Physical meetings and call conferences were organized from 2012 to 2015 (mean: 2 and 3 per year, respectively) to construct TE tools and programs for AYA with cancer, including those suffering from sarcoma.

Results
A competence referential was built and adapted to AYA population with cancer, after focus groups organized in 2 main oncologic centers with on-therapy sarcoma patients and members of the multidisciplinary TE working group.
Tools were validated and differentiated between adolescents or young adults with cancer, to help in the 4 stages of TE: the "educational diagnosis" allowing the caregiver to better understand the patient in his life journey with the disease; the "therapeutic alliance" allowing to agree with the patient on its priorities; the "implementation” which is a step of action: information, awareness, learning and psychosocial support. The final step called "assessment" allows taking stock with the patient on the changes and difficulties4.
Taking care of AYA with sarcoma included TE in the field of self-care skills, with improvement of knowledge about the disease (group sessions "What is Cancer?" with use of microscopes to visualize sarcomas cells, guided tours in a bone tumours research laboratory), treatments and consequences (workshop about "Management of febrile neutropenia”), but also in the field of coping skills in particular to improve coordination and experience of cares between the different pathways like oncology and surgery/radiotherapy networks, in-home care framework, physical readaptation, and adapted school/professional orientation with any physical disability.
Conclusion
Within the framework of varied heavy treatments, care workers dedicated to AYA with sarcoma should use TE specific actions to reinforce treatment participation and therapeutic relationships. After this work of a national TE organization, more studies using methodological tools are still required to evaluate the impact of such implemented programs.

Keywords : therapeutic education, sarcoma, adolescents, young adults
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Therapy and prognosis in chondrosarcoma

Abstract ID : 1128
Submitted by : Hans Roland Dürr the 2016-02-04 12:18:09
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Chondrosarcomas are a heterogeneous group of tumours , the major prognostic criterion being the grading. The aim of our study was first to validate our own results, but also to have a closer look particularly to low-grade lesions, which are increasingly treated intralesionaly.

Patients and Methods
Between 1982-2014 a total of 116 resection were performed in 108 patients. Those 116 cases are described. The average age of the 73 men was 49 years (15-77 years) that of the 43 female 51 years (15-88 years). The diagnosis was central chondrosarcoma in 87 cases, periosteal chondrosarcoma in 7 cases, clear cell chondrosarcoma in 5 cases, dedifferentiated chondrosarcoma in 4 cases, mesenchymal chondrosarcoma in 3 cases, myxoid chondrosarcoma in 10 cases. In 44 cases the lesion was in the femur, in 25 cases in the pelvis, in 12 cases in the tibia, in 5 cases in the foot, in the ulna in 2 cases, in the fibula in 2 cases, in the ribs in 2 cases, once each in radius, , hand and in the sternum. 31 patients died in follow-up, in 4 cases follow-up was not possible. The follow-up of surviving patients was on average 110 (12-379) months).

Results
In conventional chondrosarcoma overall survival was strongly depending to grading (Fig. 1, p=0.0067). But if we consider only G2 and G3 lesions, there was no difference. In dedifferentiated chondrosarcoma 3 of 4 patients died in the first 9 months after surgery, only one patient lived for 24 months. In chondrosarcoma 54 patients had a R0-, 31 a R1- , and 2 patients a R2-resection. Between R0 and R1 resected patients was no survival difference. This was independent (pelvis vs. other locations) to localization. Pelvic tumours per se had a highly significant worse prognosis. What was surprising was the overall survival of patients with G1 tumors (92% after 10 years, 74% after 20 years, Fig. 2). Of these patients (n=36), one patient had metastasized initial, 4 patients metastatized in follow-up (total 5/36, 14%). The subgroups of non-central chondrosarcoma must be evaluated individually.

Summary
Overall, no advantage in overall survival was seen between R0 and R1 resected conventional chondrosarcoma. What was surprising was the high rate of metastasis (5/36) in central G1 chondrosarcoma. Pelvic lesions are prognostically significantly less favorable, patients with dedifferentiated chondrosarcomas showed despite one case a fatal course.

Keywords :
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/fig-1.jpg, http://sites.altilab.com/files/122/abstracts/fig-2.jpg
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THORACOLUMBAR MULTIPLE VERTEBRECTOMY : NEW TECHNICAL OF RECONSTRUCTION POST EN BLOC MULTIPLE VERTEBRECTOMY DESCRIPTION AND LITERATURE REVIEW

Abstract ID : 1482
Submitted by : Lucas Higino the 2016-02-22 20:32:07
Category : Ewing Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: In malignant primary tumors of the spine, en bloc multiple resections have limited data available. Only the resection of a single level in en bloc vertebrectomy are held and widely discussed in the literature. Our objective is demonstration new technique after en bloc multiple vertebrectomy reconstruction.

Methods: New technical description of post en bloc multiple vertebrectomy reconstruction in 1 patient treated with curative resection indication of Ewing's sarcoma.

Results: Were feasible resected en bloc four vertebrae. Reconstruction acceptable and satisfactory in terms of mechanical stability without causing neurological deficits the patient.

Conclusion: Using allograft with interlocking nail presents a suitable solution to rebuild previous columns and post average multiple vertebrectomy and the association of 4 rods guarantees stability to this reconstruction. The technique has the immediate benefit of less hospital stay and a lower surgical morbidity compared to other customary techniques.

Keywords: En bloc multiple vertebrectomy; spinal tumors; bone reconstruction

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Keywords : En bloc multiple vertebrectomy; spinal tumors; bone reconstruction
Authors :
Supplementary material : http://sites.altilab.com/files/122/abstracts/rx-f.jpg, http://sites.altilab.com/files/122/abstracts/rx2.jpg
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Thyroid metastization of sarcomas – a rare entity

Abstract ID : 1493
Submitted by : Daniela Macedo the 2016-02-22 22:06:55
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Thyroid metastases represent 1-3% of thyroid cancers. These metastases are mostly due to kidney, lung and breast cancers. In most cases they are associated with multifocal disease and very low survival rate. Thyroid metastases arising from sarcomas are extremely rare with few cases described on literature. The authors present two case reports of thyroid metastases of sarcomas.
Case Report: One case concerns a 30 years old male, who in January 2013 resorted to his physician because of pain on left hip with about four months of evolution, with progressive worsening associated to functional disability. He mentioned weight loss of more than 10 kg. In CT of hip and left lower limb was identified an iliac's lytic lesion. He was then referred to our institution. At that time he already had pulmonary metastases and multiple thyroid nodules suspected of malignancy. The bone and thyroid biopsies (March 2013) revealed high grade chondrosarcoma. The histology and the high volume of disease with a bad performance status limited the treatment. The patient was proposed to best supportive care and he died two months after diagnosis. The other clinical case refers to a 22 years old female, which in February 2009 resorted to her physician for low back pain radiating to the left lower limb. She did a MRI that showed large sacrum's lytic lesion. She was referred to our institution. The staging exams were negative for distant disease. The biopsy was compatible with chondrosarcoma, grade 3. She was submitted to surgery in March 2010. The histology revealed a chondroblastic osteosarcoma. In the multidisciplinary meeting it was decided to do chemotherapy according to the IOR / OS-4 protocol, followed of surveillance. In CT of revaluation 2 years later there was new bone lesions (right iliac and bilateral femur), 2 subpleural nodules and 1 nodule in the right lobe of the thyroid suggestive of malignancy. She did new biopsies of bone lesions and thyroid nodule which were compatible with chondrosarcoma metastasis. The patient did 6 cycles of Gemcitabine and Docetaxel in association with zoledronic acid 4mg/month, with disease stabilization. It was followed by thyroid lobectomy and radiotherapy on iliac and right femur. In multidisciplinary decision she was proposed for treatment with pazopanib 800 mg/day, keeping zoledronic acid 4 mg/month until 2 years, which began in December 2014 and holds up to the current date, with disease stabilization.
Conclusion: Thyroid metastasis are very rare and there are no clear consensus for treatment because all recommendations are based on case reports. However, thyroidectomy is usually performed to prevent local complications and to help control the disease.

Keywords :
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TOTAL HUMERUS REPLACEMENT AT A SINGLE INSTITUTION: ONCOLOGIC AND FUNCTIONAL REVIEW

Abstract ID : 1329
Submitted by : pierluigi cuomo the 2016-02-15 20:33:16
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Upper limb salvage procedures in orthopaedic oncology patients include in rare and selected cases the excision of the entire humerus and its replacement with prosthetic or allograft implants. Shoulder and elbow function preservation is a primary goal in such procedures.
Since 2001 eleven patients (4 males, 7 females, mean age 44 +/- 22 years) underwent surgical excision of the the entire humerus. Diagnosis was primary bone tumor in 6, metastatic bone disease in 3, soft tissue sarcoma in 1 and post-traumatic sequelae in 1 patient. Humeral bone replacement was performed with an osteoarticular allograft in 2 patients, with an allograft-prosthesis composite implant in 4 cases and a total humerus prosthesis was employed in 5 cases. The 9 patients who received a full metal or composite prosthesis had their elbow replaced with an hinged implant; at the shoulder site 7 out of 9 patients received an anatomic shoulder implant while two had a reverse joint with glenosphere.
Early local postoperative complications included 1 ulnar nerve palsy. One early Pseudomonas aeruginosa deep infection was recorded in the entire series and was successfully managed with one-stage implant revision and intravenous antibiotics. Wide margin excision was achieved in primary tumor cases.
Two patients were lost at follow-up. Four patients died of disease at 6, 9, 42 and 49 months after surgery. No local recurrences were recorded. One patient is alive with disease and the others are continuously disease free.
Clinical data from 9 patients latest followup (28 +/- 16 months) are available. No implant aseptic loosening was recorded. One patient underwent glenosphere revision for post-traumatic dislocation. MSTS upper limb score was on average 15/30 (range:6-23). Active shoulder motion was lost in all the patients. Active and passive elbow motion was reduced but possible in all the patients. Half of the patients were able to eat while none of them was able to comb its hair or to write.
In conclusion total humerus replacement, as extreme limb salvage procedure, allows in selected case to eradicate the disease and preserve upper limb function particularly with respect to the elbow joint.

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Total pleuropneumonectomy as salvage therapy in children suffering from refractory sarcomas with multiple pleural localisations.

Abstract ID : 1298
Submitted by : Perrine MAREC-BERARD the 2016-02-14 18:41:44
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives
Refractory pediatric sarcomas with pleuropulmonary localizations (locoregional or metastatic extension) have a dismal prognosis without any curative treatment because of the impossibility to obtain local control. The purpose of this study was to determine if radical pleuropneumonectomy could be a therapeutic option in these cases.

Method :
We retrospectively reviewed 5 cases of pediatric refractory bone or soft tissue sarcomas with pleuropulmonary locoregional or metastatic extension, in whom a salvage pleuropneumonectomy had been performed between 2005 and 2009.

Results :
Children were 9 to 15 years-old at the time of procedure. Underlying disease included 2 metastatic Ewing sarcomas (ES), 2 metastatic osteosarcomas (Os) and one primary undifferentiated chest wall sarcoma with lung and pleura extension. Pleural localizations had occurred either at time of initial diagnosis (1 ES and 1 undifferentiated sarcoma) or at relapse (within 2 to 4 years of diagnosis). All patients received preoperative chemotherapy. Due to pleural spread, the only alternative to pleuropneumonectomy was a palliative treatment. Thoracotomies and sternotomies allowed complete resection in 1/5 and marginal in 4/5. No post-operative complication occurred. Mean post-operative average hospital stay was 11 days (range 8 to 16). Chemotherapy could be started within15 days after procedure. Six month after the procedure, Lansky score >80% was observed in all but one patient. Two patients died, respectively 3 and 10 months after surgery due to multimetastatic relapse. Three are still alive in complete remission 4, 6 and 7 years after surgery. Pulmonary function assessments showed good respiratory function at 3 months (5/5), 3 years (3/3) and 5 years (3/3).

Conclusion :
In case of primary or relapsing pediatric sarcoma with unilateral pleuropulmonary extension not accessible to conservative local treatment, a total pleuropneumonectomy is a valid salvage therapy allowing long survival. Procedure is well tolerated in children, allowing satisfying long term respiratory function.

Keywords : Sarcomas, Pleuropneumonectomy, children
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Transepiphyseal resection for osteosarcoma around the knee to save the knee joint

Abstract ID : 1241
Submitted by : HANSOO KIM the 2016-02-13 06:23:50
Category : Margins in Sarcoma
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objective:
Preservation of the epiphysis would provide the potential to maintain durable normal joint function in osteosarcoma around the knee. We asked whether the use of with transepiphyseal resection, with preservation of the articular portions of the epiphysis, and intercalary reconstruction, would provide satisfactory functional outcome without disturbing oncological outcomes.
Methods:
We reviewed 19 consecutive patients with osteosarcoma of the knee who had been treated with transepiphyseal resection and intercalary reconstruction. Allograft (n=18) or pasteurized autograft (n=1) were used for reconstruction for mean length of 18cm (range, 6.7-39.6 cm). The mean resection margin of the epiphysis was 1.2 cm (range, 0.3-2.4 cm). The minimum followup was 12 months (mean, 40 months; range, 12-122 months).
Results:
Thirteen patients were CDF and 6 had no evidence of disease at the last follow-up. Local recurrence occurred in one patient (5%) with pathological fracture Union of the graft was achieved in 15 patients (79%) at an average of 12 months (range, 3-26 months). Six patients had complications that included diaphyseal nonunion (n=4), deep infection (n=1), and graft fracture (n=1). Two grafts (11%) were removed for local recurrence and graft fracture. Patients with a preserved epiphysis had an average knee ROM of 120° (range, 90-150°).
Conclusion:
Our data suggest that transepiphyseal resection and intercalary reconstruction for osteosarcoma around the knee showed satisfactory outcomes in terms of both oncological and functional outcomes.

Keywords : osteosarcoma, transepiphyseal resection
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Transfusion of irradiated intraoperatively collected autologous blood in orthopaedic tumour surgery: a possible alternative to the allogeneic blood transfusion

Abstract ID : 1496
Submitted by : Marko Bergovec the 2016-02-22 22:32:07
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Surgical treatment of orthopaedic patients is sometimes accompanied with significant intraoperative and/or postoperative blood loss, thus leading to a need of blood transfusion. The need for blood transfusion in orthopaedic tumor operations is sometimes even greater than in non-oncology operations. The system of intraoperative cell salvage could be a possible option, but since the tumour cells might be present within the scavenged blood it is unclear whether it is contraindicated due to high risk of tumor dissemination.
There are two possible ways used in attempt to erradicate tumor cells from the intraoperative collected autologous blood. (1) A leukocyte depletion filter is used as an effective system for tumor cells removal, and is used in various surgical fields. (2) Irradiation of the intraoperative collected autologous blood transfusions should theoretically destroy all viable tumor cells, thus making it usable for retransfusion.
The aim of this report is to review the current evidence for cell salvage in orthopaedic tumor operations. We also present our experience with the pilot study of the irradiated intraoperative collected autologous blood transfusions in orthopaedic tumor surgery.

Materials and methods
We searched the Medline/PubMed, Web of Science, Scopus, and Cochrane Database of Systematic Reviews in order to find the clinical application of using intraoperative collected autologous blood transfusions in orthopaedic oncology surgery.
In our pilot study we considered using irradiated intraoperative collected autologous blood transfusions in cases where significant blood loss was expected, and in a patients with a tumors with a higher risk of intraoperative bleeding (like renal cell carcinoma metastasis). We have available gamma irradiation of the autologous blood on-site, which could be used when needed. Used radiation dose was 60 Gy.

Results
The publications regarding autologous blood transfusion in orthopaedic tumor surgery is scarce. In-vitro studies have shown that filtering and irradiating the salvaged blood eradicate tumour cells or significantly reduce the number of tumour cells. According to available publications, in the non-orthopaedic tumor operations there is no evidence of a negative clinical/oncological impact of the autotransfusion.
In our pilot we included five patients: three with pathologic pelvis fracture due to renal cell carcinoma (n=2) and breast carcinoma (n=1), one with one with pathologic proximal humerus fracture due to multiple myeloma, and one with 5th thoracic vertebrae metastasis due to angiosarcoma. We transfused an average 380 ml (range: 130 ml to 950 ml) of the irradiated intraoperative collected autologous blood. None of our patients had postoperative infection or any transfusion reaction. The follow-up was to short for the analysis of the tumor recurrence.

Conclusion
The present literature lacks the recommendations regarding the use of autologous transfusion in orthopaedic tumor surgery. Due to risks and benefits of both autologous cell salvaged blood in comparison to allogeneic blood the efforts are needed towards autologous transfusion. The ongoing study of the clinical application of the irradiated intraoperative collected autologous blood transfusion in a larger number of patients by stated group of authors is in progress.

Keywords :
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Treatment outcome and complications of different fillers used after curettage of benign bone tumors. A systematic review.

Abstract ID : 1397
Submitted by : Edgard E. Engel the 2016-02-21 02:46:00
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction and Objectives: The treatment of some benign bone lesions is usually performed by curettage and filling the cavity with either autologous bone graft, bone cement allograft, heterologous graft or synthetic bone substitutes. More recently, some authors suggest that these defects do not require any filling to consolidation. With a systematic review of the literature, our goal was to identify whether these cavities need to be fulfilled and what is the best filling method.
Methods: We performed an electronic search using PubMed and Lilacs databases without restriction of publication dates, searching for studies describing filling options of bone cavities, after benign bone tumor curettage. Complications, time required for consolidation, period without weight bearing in the operated limb, functional assessment and its relationship to the size of bone defect and filling method, were the data of interest of this review.
Results: Sixty-two articles were included after evaluation of 2456 studies enrolling 2555 patients. Only one was a randomized trial. There was no variation of functional evaluation according to "Musculoskeletal Tumor Society Score" (MTSS) among different treatments modalities. Relapse rates could not be related to treatment options, except for giant cell tumor (GCT) treated whit bone cement .The average time of weight bearing protection was 8 weeks, except for the treatment with bone cement in which early weight bearing was allowed . The higher fracture rate (6.6%) corresponded to the cavities left unfilled. Bone substitutes showed slightly longer healing time (4 months).
Discussion / Conclusion: None of the filling methods was free of complications, but cavities left unfilled had lower complication rates, except for fractures. Osteosynthesis showed to be a reliable method for fracture prevention. Thus, we concluded that none of filling methods was free of complications, and there is just a little difference between these methods, even when compared to not filling. If there is a difference on consolidation, this has not been detected in clinical studies. For this reason, leaving empty the bone cavities may be an attractive alternative. The combined prophylactic stabilization radically reduced fracture rate, and therefore should be considered more often, once the predictive parameters for fracture risk are flawed. The main limitations of this review are related to the near absence of randomized study and consequent inclusion of many studies describing low level of evidence, and the inability to relate the data and epidemiological trends in each case, especially in larger series, which limits the interpretation of some data.

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Triple corpectomy block for treating epidermoid lung tumor invading the medullary canal. Case report.

Abstract ID : 1392
Submitted by : Rafael Luque the 2016-02-20 17:44:14
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction
Male 63, smoking 20 cigarettes a day, non-insulin dependent diabetes mellitus, hypertension and previous MI who come twice to the emergency room referring right chest pain two months duration radiating to shoulder region and ipsilateral arm. Chest pain worse by lying and is not modified with respiratory movements. No pain relief in spite of analgesia WHO 2nd step. Further relates fatigue and weight loss of about 2 kg in the last two months. No fever, hiporexia, night sweats and dyspnea.

Methods
- Rx chest: approximately 25 mm nodule ill-defined borders

- TC: a peripheral lung mass at the back of the apical segment of LSD, with a clear invasion of the chest wall objective. The injury has approximate dimensions of 5.6 x 3.8 x 6 cm. Poorly defined edges and heterogeneous enhancement. There is extensive bone destruction of the fourth and less on the fifth right ribs, reaching also affect the vertebral body D4and hole right even the spinal canal.
- FNA: material for cytological analysis is extracted. AP: malignant tumor cells, carcinoma type of small cell differentiation which immunophenotype suggests epidermoid cancer.

- PET-CT: asymmetry in attracting cricoarytenoid posterior region, with increased uptake in the left side, probably benign functional. Lung mass localized in the apical segment of LSD infiltrating chest wall with destruction of the fourth and fifth ribs and greater involvement of the pedicle hole right combination of D4. This mass is introduced further into the spinal canal

Receive 5 chemotherapy cycles of carboplatin-Taxol and in addition to concomitant radiotherapy
In reevaluation CT objective partial response of mass (decrease in the size of the mass and decreased epidural component) so surgery is planned jointly with the Thoracic Surgery.

Results
In a first thoracic surgeons performed in the left lateral right posterolateral thoracotomy for 5th ICS. Tumor meeting in posterior segment of LSD. posterior segmental resection is performed LSD leaving the tumor attached to vertebral bodies. Release esophagus and aorta in length T2-T6. Thoracic duct ligation. mediastinal lymphadenectomy. Section 3rd-4th and 5th rib arches distal to the tumor. LID suture. In a second spine surgeons prone perform posterior approach T1-T9. Placement of pedicle screws T1-T2, T7-T8-T9 and rodding. Wide, bloc resection of vertebral bodies T3-T4-T5. Ligation roots T3, T4, T5 and T6 bilateral. Removal of vertebral bodies T3-T4-T5 and T6 part. previous reconstruction Moss basket filled allograft.

Conclusion
The patient spends in the immediate postoperative period elapses ICU and income is maintained for 7 days. Begins walking brace. Valued at regular consultations presents good evolution. Three years later, the patient continues asymptomatic and free of disease.

Keywords : triple corporectomy, lung tumor, invading the medullary canal
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Tumors of the foot: experience with 143 cases

Abstract ID : 1456
Submitted by : Ruben Fonseca the 2016-02-22 10:46:29
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: Tumors originating in the foot are relatively rare, accounting for less than 2% of all sarcomas, and less than 10% of soft tissue sarcomas. As such, their particular clinical and pathological features, therapeutic approach and outcomes are not well established. Due to inadequate or late diagnosis of these lesions, and also the surgical complexity in obtaining complete surgical resection, these tumors have been associated with greater recurrence rates. The purpose of this study was to analyze a series of patients treated in a single musculoskeletal oncology referral center, in a 20-year period.
Materials and Methods: From January 1994 to December 2014, data was collected regarding patients with primary musculoskeletal tumors of the foot (benign and malignant) treated in our institution. We reviewed tumor frequency and incidence, patient's demographic data, as well as clinical outcomes.
Results: 143 patients were identified in the considered time period. The mean age at diagnosis was 52 years old; 56% (n=80) of the patients were female. The majority of lesions (86.7%; n=124) were soft tissue tumors, and only 13.3% (n=19) were bone tumors. Benign tumors were dominant over malignant lesions overall, benign tumors accounted for 77% (n=110) of lesions, and the remaining 23% (n=33) corresponded to malignant lesions. Median follow-up time was 49 months. The most frequently diagnosed benign lesions were giant cell tumor, angiomyoma, and lipoma .Regarding malignant tumors, synoviosarcoma was the predominant histologic type.
Conclusion: The complex anatomy of the foot makes it unique and hence poses a surgical challenge in terms of limb salvage. The goals of treatment include local tumor control, restoration of function and stability during standing and walking, long-term survival, and improved quality of life. In most cases, wide surgical margins require a ray, Syme, midtarsal, or below-the-knee amputation. Recent advances in chemotherapy and radiotherapy have allowed limb salvage procedures with wide tumor resections; however, due to this improved overall survival, the reconstruction of skeletal defects needs to be more functional and durable.

Keywords : bone; giant cell tumor; neoplasm; sarcoma; soft tissue; surgery
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Two Stage Revision of an Infected Total Knee Arthroplasty Tumor prosthesis with a custom-made mobile “tumor” spacer – A case report

Abstract ID : 1470
Submitted by : Luís Barros the 2016-02-22 16:33:07
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction:
The reported complications rate of tumor prostheses remains 5-10 times higher than in primary total joint arthroplasty. Periprosthetic infection is a major concern because of the extensive soft tissue dissection, long operating times, and patients'immunosuppression by cancer and adjuvant treatments. The infection rate after primary limb salvage surgery has been between 8-15%, and following revision surgery, an infection rate as high as 43% has been reported. Infection carries severe consequences, especially in these cases where not only are there several biologic issues that may hamper the success of infection eradication but also there are specific technical problems such as bone stock and soft tissue envelope that may compromise limb preservation options.

Methods: A single case-report

Results: A 57 years-old male with a distal femur grade 2 fibrossarcoma (Eneking IIB) underwent total knee arthroplasty with modular endoprosthesis, in 19/04/2007. Pathology of the excised tumor confirmed diagnosis and revealed wide margins and after eight years of follow up, there is no local recurrence or distant metastases.
Nevertheless several complications occurred that mandated different surgical procedures.
Three years after primary surgery the patient started having knee pain and x-ray revealed femoral loosening of the prosthesis. This was confirmed during surgery which consisted of revision of the femoral stem. There were no signs of infection at this stage.
Persistent pain was interpreted as patellar suffering and a patellar resurfacing surgery was performed in 10/10/2011. Two weeks after this surgery, there were clinical signs of acute infection and the patient underwent two surgical debridements. Prolonged antibiotic therapy was instituted.
Due to lingering pain and the presence of a sinus tract a chronic infection diagnosis was assumed but it was decided to continue with suppressive antibiotic therapy.
Finally in 02/04/2015, as pain was getting worse the patient agreed on a two-stage revision. At first, a thorough debridement and implant removal was made. A custom made articulating cement spacer loaded with vancomycin and gentamicin was used. After three months, a total femur arthroplasty with a silver-coated titanium megaprosthesis was performed.
At twelve months follow-up, the patient is pain free and there are no signs of infection. The functional outcome is good, 25/30(83.3%) in the MSTS score.

Discussion:
This case highlights the major detrimental impact that infection may have in limb preservation surgery. The importance of early diagnosis, appropriate treatment strategy, accurate identification of the infecting pathogens, and appropriate antibiotic regimen are crucial elements.
Debridement and irrigation with prosthesis preservation is often the first attempt in these difficult cases but its success depends on the short duration of symptoms, knowledge of the infecting microorganism and correct antibiotic therapy with anti-biofilm properties.
Two-stage procedures are the mainstay of chronic prosthetic joint infection but reconstruction options are frequently difficult in these patients. In the case presented the proximal femur was no longer suitable for adequate fixation of a new femoral stem and we therefore chose to perform a total femur arthroplasty. In order to minimize the risk of re-infection we used a silver-coated titanium third-generation metal megaprosthesis.

Keywords : Infection, tumoral prosthesis, surgical debridements, two-stage revision
Authors :
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Unplanned stimulation of the proximal tibial growth plate by implanting a custom made distal femoral spacer in a 5-year old osteosarcoma patient

Abstract ID : 1245
Submitted by : Andreas Leithner the 2016-02-13 12:11:04
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Limb salvage in very young children affected by osteosarcoma around the knee is sometimes very difficult to achieve, as most extendible prostheses need resections lengths of about 17 cm leaving not enough bone stock for a secure proximal stem fixation. Furthermore the tibial stem (although smooth) damages the proximal tibial growth plate leading to even more leg length discrepancy over time. To overcome this problems experimental operations techniques like the use of resurfaced allograft-prosthetic composites have recently been published. We like to report the case of unconstrained 13 cm articulating distal femoral spacer implanted in a 5 year old boy.

In 2011 an osteosarcoma of the distal femur was diagnosed in a 5-year old boy. Due to the young age rotationplasty was recommended but declined by the parents. The femur being too short for the implantation of an extendible prosthesis a 13 cm long custom made articulating spacer with a short, straight, round and smooth stem in the proximal femur was designed in order to allow full weight bearing and sparing of the proximal tibial growth plate. After 2,5 months of neoadjuvant chemotherapy this prosthesis was implanted, but the stem had to be revised after 19 months due to clear signs of stem migration. Another custom made stem (this time hexagonal, curved and smooth with 1 cm of distal HA coating) was implanted, the distal articulating part was left in place. Even before this revision the patient had full weight bearing without pain using an orthosis for security reasons (the collateral ligaments were reconstructed but not totally trusted). After 4 years and 5 months this construct was explanted at a leg length discrepancy of 5 cm. A “normal” extendible prosthesis (Implantcast) was implanted with no problems so far (2 months of follow-up). The most astonishing result of this articulating spacer was an overlengthening of the tibia of the affected side of + 1,3 cm.

This technique is experimental and the parents were well aware of possible risks like revisions, infection and eventually the need for an amputation. So far the idea went fine. However, for us the most interesting results was the “compensatory” stimulation of the proximal tibial growth plate, helping us to leave this construct in place for 4 years and 5 months. A local aspetic inflammatory process (metal on menisci / cartilage) might have caused this – however the boy was without any local pain and full weight bearing. It would be extremely helpful to identify the underlying process as one might think about not lengthening the prostheses but the remaining bone.

Keywords : osteosarcoma, extendible prosthesis, paediatric, reconstruction
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Supplementary material : http://sites.altilab.com/files/122/abstracts/2y7mo-postop.pdf, http://sites.altilab.com/
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Use of Rotating Hinge Segmental Prosthesis in the Salvage of Deep Musculoskeletal Infections of the Knee

Abstract ID : 1437
Submitted by : Joseph Ippolito the 2016-02-22 00:13:37
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction: The treatment of deep prosthetic infections of the knee often requires removal of large skeletal segments. In order to preserve limb length and stability, standard implants are not effective. In patients requiring two-stage re-implantation procedures, the use of a standard rod plus antibiotic impregnated PMMA spacers may be attempted with satisfactory results. Rotating hinge design provides an option to address the challenges of segmental replacement.
Objectives: Rotating hinge replacements afford enough stability to allow adequate debridement and resection in the face of deep infections of the knee.
Methods: Between 1992 and 2014, 17 patients were treated with two-stage re-implantation for musculoskeletal infections involving the knee. There were 9 males and 8 females. Mean age was 51 (range, 16-70). Seven patients had infected tumor prostheses, six patients had an infected total knee arthroplasty, and four patients had a primary infection involving a large skeletal defect. Following debridement and explant, the defect was temporarily stabilized with Tobramycin and Vancomycin impregnated PMMA and intramedullary nails. Patients were treated with IV and oral antibiotics for six weeks each. After confirmation of resolution of infection with normal ESR, CRP, WBCs, and negative cultures, segmental rotating hinge prostheses were utilized to address the resulting defects.
Results: Mean skeletal defect was 20.6 cm. Mean time from the index procedure until infection was 14.6 months. Mean time from initiation to completion of two-stage re-implantation was 8.9 months. The organisms cultured were gram positive in 11 cases, gram negative in 1, mixed in 2, and mycobacterium in 1. Two patients had no growth on cultures, but had histologic evidence of acute infection. Of the 17 patients, 11 (65%) were successfully re-implanted following the initial two-stage procedure. Six patients had recurrent infections. Two patients with recurrent infections were successfully re-implanted after an additional one-stage procedure. Two patients had a second two-stage procedure and have retained their spacers. Two patients required amputation for recurrent infection. Successful limb salvage in regards to infection control occurred in 13/17 (77%) patients. One patient later required an amputation for an oncologic complication (local recurrence), with a mean MSTS score of 20.9 (70%), plus 2 patients with retained spacers.
Conclusion: For patients with deep prosthetic infections at the knee, two-stage re-implantation results in successful infection control and limb salvage. Resulting defects following these re-implantation procedures can be successfully treated with segmental rotating hinge implants, with a limb retention rate of 80% and satisfactory MSTS scores.

Keywords : Infection, Megaprosthesis, Knee
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Uterine Lipoleiomyosarcoma : Complete medullary compression as presentation of a solitary metastasis

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Submitted by : Sophie Mottard the 2016-02-25 13:03:34
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Leiomyosarcoma is a rare malignant neoplasm representing 7% of all soft-tissue sarcomas. There exists a rare tumor subtype containging both leiomyosarcomatous and lipomatous components that is described as a lipoleiomyosarcoma. Only a few cases of uterine lipoleiomyosarcoma are described in the litterature and only one presented a spinal metastasis.
We have revised a unique case of leiomyosarcoma. Clinical data including disease evolution, operative data, radiographic imaging and pathology analysis have been collected and presented in this paper.
Our patient was a 59 year old post-menoposal woman with a history of hysterectomy for recurrent bleeding. The pathology was consistent with a leiomyoma of uncertain malignant potential. Three years later, she presented with solitary vertebral metastasis which was diagnosed as a lipoleiomyosarcoma. She underwent a decompressive and fusion surgery and required an en bloc resection for residual tumor. Adjuvant therapy consisting of radiotherapy and hormonal treatment with an aromatase inhibitor were administered. Two years post decompressive surgery, the patient developed a solitary pulmonary metastasis for which a lobectomy was performed.
We believe this is the second reported case of spinal metastatic lipoleiomyosarcoma. Adjuvant radio and chemotherapy are usually used, but there is currently no protocol since this clinical entity is extremely rare. Considering the possibility of relatively long survival, high local recurrence rate and inevitable progression of spinal lesions, aggresive surgery and adjuivant therapy should be advocated.

Keywords : Lipoleiomyosarcoma, metastasis, medullary, compression, evolution, therapy
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Validation of a simple prediction model for survival in patients with cancer and symptomatic metastases of the long bones

Abstract ID : 1226
Submitted by : Julie Willeumier the 2016-02-12 11:20:53
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Introduction Expected survival in patients with metastatic cancer is a crucial factor to determine the extent of treatment for symptomatic metastases of the long bones. Recently, a simple prediction model for patients with spinal bone metastases was developed and validated, using only clinical tumour profile (favourable, moderate, unvafourable), presence of visceral and/or brain metastases and Karnofsky performance score (100-80, or < 70) to categorise patients into four survival categories (Bollen et al. Neuro-Oncology, 2014). These categories corresponded to median survival times of 31.2, 15.4, 4.8 and 1.6 months for category A, B, C, and D respectively (C-statistic 0.69). This study aims to validate the abovementioned model for patients with symptomatic metastases of the long bones.
Methods Patients treated for symptomatic metastases of the long bones between 2000 and 2013 at the orthopaedic and/or radiotherapy departments were identified (n=696; 47% male; mean age 65 years (range 10–93)). Radiotherapy was the primary treatment in 71% of the patients, while surgery was the primary treatment in 29%. All patient data needed to use the model was registered. The original tumour profile was adjusted slightly for 2 tumour types. For breast cancer, the molecular phenotype was incorporated in the clinical tumour profile (receptor positive phenotype as favourable; triple negative as unfavourable). For kidney cancer, the clinical tumour profile was adjusted if there was a solitary metastasis (solitary as favourable; not-solitary as moderate). Survival curves were estimated using the Kaplan Meier method and accuracy was assessed with the C-statistic. Additionally, accuracy was assessed as time-dependent area under the receiver-operating characteristic curves (AUC) at 3, 6 and 12 months.
Results Median overall survival was 6.6 months (95%CI5.6-7.3). The most common primary tumour types were breast (30%: 25% receptor positive phenotype, 1% triple negative and 5% unknown), prostate (17%), lung (25%), and kidney (8%: solitary 2%; not-solitary 6%). Primary tumours were categorised into three groups: favourable (33%), moderate (25%), and unfavourable (42%). Visceral and/or brain metastases were present in 42%. Performance score was 80-100 in 56% and >70 in 44%. The model distributed the patients as such: category A(13%), category B(30%), category C(36%), category D(22%). Median survival in category A was 27.3 months (95%CI19.9-34.7), for B 13.3 months (95%CI11.9-14.8), for C 5.5 months (95%CI4.5-6.5), and for D 2.0 months (95%CI1.7-2.3). Harrell's C statistic was 0.69. The AUC was 76%, 78%, and 79% for 3, 6, and 12 months, respectively.
Conclusion Clinical tumour profile, presence of visceral and/or brain metastases, and Karnofsky performance score, according to the previously proposed spinal metastasis prognostic model, provide significantly different prognostic categories for patients with cancer and metastases of the long bones. The C-statistic is equal to the initial spinal model, indicating the use of one simple survival for spinal and long bone metastases is possible. This further facilitates and encourages it's use in routine care of bone metastases, where it can aid in shared decision-making between doctor and patient.

Keywords : Bone metastases, prognosis, survival, model, personalised treatment
Authors :
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Validation of the Toronto Extremity Salvage Score in patients with malignant musculoskeletal tumor in the upper extremities

Abstract ID : 1447
Submitted by : Toru Akiyama the 2016-02-22 09:23:00
Category : Others
Typology : Poster
Status : Validated
Authorisation to disclose : Yes/Oui

Objectives: The Toronto Extremity Salvage Score (TESS) is a widely used disease-specific patient-completed questionnaire for the assessment of physical function in patients with musculoskeletal tumors; however, its reliability and validity have only been confirmed in a few studies. The aim of this study was to validate the Japanese version of the TESS in patients with musculoskeletal tumors in the upper extremity.
Methods: After developing a Japanese version of the TESS, the questionnaire was administered to 53 patients to examine its reliability and validity in comparison with the Musculoskeletal Tumor Society (MSTS) scoring system and Short Form-36 (SF-36).
Results: Test-retest reliability with intraclass correlation coefficient (0.93) and internal consistency with Cronbach's alpha (0.90) were excellent. Factor analysis showed that the construct structure consisted of 3-item clusters, and the Akaike Information Criterion network also demonstrated that the items could be divided into 3 domains according to their content. The TESS strongly correlated with the MSTS rating scale ($r = 0.750$; $P < 0.001$) and the SF-36 physical functioning scale ($r = 0.684$; $P < 0.001$). However, as expected, the TESS had low correlations with the SF-36 mental health and role-emotional subscales and the MSTS scoring system manual dexterity domain.
Conclusions: Our study suggests that the Japanese TESS is a reliable and valid instrument to measure patient-reported physical functioning in patients with upper extremity sarcoma. The Japanese TESS enables international comparisons of treatment results.

Keywords : Toronto Extremity Salvage Score, upper extremity, function
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VENOUS THROMBOEMBOLIC EVENTS (VTE) IN SARCOMA PATIENTS: RETROSPECTIVE ANALYSIS OF AN INSTITUTIONAL DATABASE

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INTRODUCTION
Venous thromboembolic events (VTE) are a well-known complication of cancers, most notably adenocarcinomas and hematological malignancies. Sarcomas are usually not considered thrombophilic, but little has been published on the incidence and risk factors of VTE in sarcoma patients.

METHODS
An institutional database of 995 consecutive sarcoma patients was reviewed for the following information: demographics; diagnosis of thromboembolism by Doppler ultrasound or dedicated computed tomography; sarcoma subtype; disease stage; presence of vessel compression, existence of predisposing factors (postoperative setting, central venous catheter placement). Descriptive statistics were used.

RESULTS
72 patients (49 M, 23 F), aged 21-86 years, had at least one VTE, resulting in an incidence of 7.23% in sarcoma patients. If postoperative setting and central venous catheter placement were excluded, the number of sarcoma-associated VTE was 37, corresponding to an incidence of 3.7 %. Despite anticoagulation with low-molecular-weight heparin (LMWH), an additional 14 cases of recurrent VTE were documented. The most common subtypes of sarcomas associated with VTE were: liposarcoma (15), osteosarcoma (11), leiomyosarcoma (10), myxofibrosarcoma (6), Ewing sarcoma and synovial sarcoma (5 each). The following risk factors were identified: disease progr`ession or recurrence, metastatic stage, tumor proximity to vessels, administration of chemotherapy. Tumor grade and anatomic location were not apparent risk factors. A full statistical analysis will be presented.

CONCLUSION
Thromboembolic events are infrequent in sarcoma patients and are associated with aggressive disease behavior as well as medical interventions. Given the overall low frequency of VTE in these patients, routine thromboprophylaxis does not appear to be warranted, except in high-risk situations such as surgery.

Keywords : venous thromboembolism; sarcoma
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Volumetric Target Registration Error color maps: Going beyond the single metric for surgical navigation accuracy

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* Introduction
Real-time surgical navigation requires the registration of the image and tracking coordinate systems.Fiducial registration error(FRE) and fiducial configuration significantly impact target registration error(TRE) distribution. TRE has a direct impact on navigation accuracy during tumor surgery where close margins are expected.

* Purpose
To provide a dynamic,real time volumetric and surface rendering of TRE distribution using a color map of the surgical region of interest.

* Methods
Once conventional registration is performed using image and tracking coordinates of a defined region of interest,a custom built tumor navigation software iterates over all points of the 3D CT image, storing values of TRE for each point(as calculated from the FRE value and the fiducial configuration).To render an intuitive map each point is assigned a discrete color based on its TRE value in millimeters :0-1 is green,1-2 is yellow,2-3 is orange, 3 and higher is red.(Fig1)

* Results
The TRE color maps provide instant,dynamic,real-time,intuitive and accurate surgeon feedback.It has been successfully used as a tool to validate a novel registration method as a part of a larger clinical trial using a custom surgical navigation platform for navigation guided extremity bone tumor surgery.(Fig2) It provides real time target error value at the tool tip at the time of performing osteotomies using pointed(burr) or planar(osteotome,saw) cutting tools.(Fig 3)It has shown utility in a test bed for pre-operative optimization of fiducial configurations for challenging pelvi-sacral tumor resections.(Fig4)

* Conclusions
TRE color map is a simple yet powerful visualization tool that provides meaning and simplifies understanding of the impact of fiducial configuration on target error distribution.It is an effective tool for surgeons who use K wires or screws as fiducial surrogates to optimize their placement for an adequate target error distribution.Surgeons performing complex tumor surgery involving close margins may benefit from an intuitive 3D visualization tool for planning and evaluating navigation registrations.

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Keywords : navigation,registration,errors,target error,color-maps
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Whole exome sequencing in osteosarcoma reveals important heterogeneity of genetic alterations

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Keywords : osteosarcoma whole exome sequencing next generation sequencing MDM2
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Supplementary material : http://sites.altilab.com/files/122/abstracts/abstract-emsos.docx, http://sites.altilab.com/
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WHOLE LUNG IRRADIATION AFTER HIGH DOSE CHEMOTHERAPY AND AUTOLOGOUS HAEMATOPOIETIC STEM CELLS TRANSPLANTATION IN EWING SARCOMA

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Typology : Poster
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Authorisation to disclose : Yes/Oui

Purpose
To describe outcome and toxicity in patients with Ewing Sarcoma treated with high dose chemotherapy with busulfan plus melphalan, autologous haematopoietic stem cells transplantation and whole lung irradiation (WLI).
Methods
This retrospective, monocentric study collected patients with Ewing Sarcoma Family Tumour treated at our institution with WLI after high-dose chemotherapy (HDCT) with busulfan plus melphalan from 1st June 2001 to 1st October 2014. All patients were enrolled in ISG/SSG-IV; AEIOP/ISG EW-2 AND EW-REL protocol studies designed by Italian Sarcoma Group (ISG). All patients underwent to a consolidation therapy, consisting in high dose chemotherapy and WLI. Patients, whose pulmonary metastases did not respond at induction, underwent surgical resection of pulmonary metastases (PM). WLI was administered by three dimensional (3D) conformal technique (AP/PA fields), at a dose of 15 Gy in 10 fractions (fr) (in patients > 12 years old) or 12 Gy in 10/fr (in < 12 years old). All patients were evaluated with Pulmonary Function Tests (PFT) before consolidation treatment. Clinical and radiological exams were performed during follow-up. Duration of survival was defined as the time interval between diagnosis and death from any cause or most recent follow-up visit. Duration of disease free survival was defined as the time interval between diagnosis and disease recurrence or progression, death or most recent follow-up visit.
Results
During a 13 years period, 17 patients with a diagnosis of Ewing sarcoma with lung metastases, treated WLI, were included into the study. Mean age at time of diagnosis was 16.1 years, with a median of 17 years (range 7-34). The mean follow-up time of surviving patients was 34.9 months (range 10-84). Patients, whose pulmonary metastases did not respond to induction chemotherapy, were five (29.4%), and they underwent surgical resection of pulmonary metastases. Pulmonary function tests before consolidation treatment were available for 11 patients: 10 resulted normal; one showed an obstructive impairment related to metastasectomy. Radiation pneumonitis developed in three patients at a median of 3 months (2, 3, 4) after WLI and was successfully treated with steroids. One case of pericarditis, one case of esophagitis and one case of hypothyroidism were detected after HDCT and WLI. The rate of pulmonary relapse was 52%. At 12, 24, 36 months, DFS was 80.7%, 53.8% and 40.3% and OS was 100%, 78% and 54.5%. Younger patients (< 16 years old) had a higher survival (at 12, 24 and 36 months: 100%, 100%, 85% versus 100%, 53.6% and 17.9%, respectively; p= .005).
Conclusion
In our experience WLI administered after HDCT is a procedure affected by side effect in 17.6% of patients. Furthermore our findings showed a higher survival in patients younger than 16 years old. Further study are warranted to investigate WLI role in patients with Ewing Sarcoma.

Keywords : Whole lung irradiation; Ewing Sarcoma; High Dose Chemotherapy
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Whole-exome sequencing strategy to unravel molecular mechanisms of resistance to conventional therapies in chondrosarcomas

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Introduction
Chondrosarcomas are bone malignant tumors that produce cartilage matrix. Chondrosarcoma is the second most frequently primary malignant tumor of bone. They are considered as resistant to both chemotherapy and radiation, making surgical resection the only curative treatment. However, mechanisms of resistance are not well understood as only 76 studies are reported in Pubmed since 1975. This emergent study aims to unravel the molecular mechanisms involved in the resistance of chondrosarcomas to cisplatin or to X-ray treatments by an innovative strategy of comparative functional genomics.

Materials and methods
The response to cisplatin treatment or to X-ray radiation of five cell lines derived from human chondrosarcomas were compared in regard to their genetic background assessed by whole-exome sequencing.

Results
We compared the response to cisplatin treatment or to X-ray radiations of five cell lines derived from human chondrosarcomas. The cell lines had distinct responses to treatments involving apoptosis and/or senescence. To understand the molecular basis of these different sensitivities, we performed whole-exome sequencing on the cell lines. After strict filtration, 245 to 476 rare coding or splice variants per cell line were predicted to have a deleterious functional impact on the protein. We applied targeted, then pangenomic approaches to select relevant variants. We identified 66 mutated genes potentially implicated in the response to therapies. Interestingly, recurrent loss of function mutations of a tumor suppressor gene were identified in the three most resistant cell lines in which no apoptosis is induced by X-rays nor cisplatin. This gene is actionable by targeted chemotherapy. Functional analyses are in progress to validate the role of these very promising gene mutations in resistance to treatments. Sixty-five other genes were also mutated and will be investigated further.

Conclusion
We show that chondrosarcoma cell lines respond differently to conventional therapies. In addition, our study is the first one which extensively characterizes commonly used human chondrosarcoma cell lines by whole-exome sequencing. Our preliminary results provide essential genetic information on resistance mechanisms through the identification of genes potentially involved in the response to cisplatin treatment and X-ray radiations.

Keywords : chondrosarcoma, resistance, mutation, whole-exome sequencing
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