



MONTRÉAL
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ABSTRACT BOOK

Short Free Papers

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52698

**KEY NOTE LECTURE: PERIPROSTHETIC FRACTURES AROUND THE
KNEE**

Conjeevaram B MAHESHWER

, . (UNITED STATES)

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49669

RESULTS OF MIPO METHOD IN CALCANEAL FRACTURES IN COMPARISON TO PLATE FIXATION AND THE ROLE OF RADIOLOGY IN OUR TREATMENT STRATEGY

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Introduction: A study to compare the results of minimally invasive CRP/SF (closed reduction and pin / screw fixation) vs. open reduction and plate fixation (ORPF) of the calcaneal fractures. Methods and materials: Between April 2009 and December 2013, 279 patients were treated in our institution with calcaneal fractures. Only 160 patients were followed up due to employment regulations. We used the Sanders classification of the calcaneal fractures. All patients who were smokers, diabetic, had vasculopathy or non-compliant underwent CRSF. Non weight bearing mobilization was indicated for all patients. Results: From the 160 patients, 28 (17.5%) had multitrauma, and 11 (6.88%) who suffered bilateral calcaneal fracture. 71 (44.38%) patients were treated conservatively, and 89 (55.62%) underwent surgery. Among those patients who underwent surgery, 57 (35.63 %) fractures were pinned or underwent CRSF, and 32 (20%) patients underwent ORPF. The best postoperative results were noticed with the patients who had extraarticular and Sanders type I fractures. The Böhler angle was corrected easily with those patients who underwent CRSF using the reduction instrument (Zdravec ligamentotaxis theory), but the articular surface reduction was better in those who underwent ORPF. Radiation time lower to CRP/SF. 2 mm posterior facet articular surface step had similar postoperative functional results. There were 5 (3.1%) postoperative superficial wound healing complications but not infections, but none with those patients who were treated with CRP/SF. Conclusion: Clinical/ambulation better with CRP/SF. Functionality no difference between the two methods. There is a need of rigid criteria of selection between the two methods.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52511

OUTCOMES OF MANAGEMENT OF PERIPROSTHETIC FRACTURES AROUND STABLE HIP OR KNEE IMPLANTS WITH 'TOTAL FEMORAL PLATING'

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Objectives: Periprosthetic fractures around or distal to hip or knee replacements represent a complex injury. Evidence supports open-reduction-internal-fixation however non-union, infection and further fracture remain a concern. We present our outcomes following 'total femoral plating' for these fractures. Methods: A retrospective study of 17 consecutive patients treated between May 2014 and December 2017 with total femoral plating (TFP) for fracture around THR or TKR was performed. TFP was defined as open-reduction-internal-fixation with plates spanning the prosthesis and entire femur. Patients were followed-up clinically, function assessed using the Oxford Hip or Knee score (OH/KS), and quality of life by EQ-5D score. Radiographs were reviewed to establish union and complications were recorded. Results: Twenty-two patients were identified. Three were excluded due to simultaneous revision arthroplasty. Two died of unrelated causes. Of the remaining 17 patients average age was 72.5 years, 88% were female, ASA grade was 3, mean follow-up was 24 months. Three patients were excluded from outcome scores due to dementia. For the remainder mean OH/KS was 50.25, EQ-5D scores were >4 for all modalities, Visual Analogue Scale (VAS) was 64.4/100. At follow-up 58% demonstrated radiographic union at 3 months, 76% at 6 months. Four had symptomatic non-union, 3 had revision plating or retrograde nailing. One patient underwent revision arthroplasty to proximal femoral replacement with good clinical outcome. No other operative complications were identified. Conclusion: Total femoral plating provides pain relief and return to function when used to treat periprosthetic fractures around stable implants in this challenging patient group.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 50830

INTRAMEDULLARY NAILING WITH STEM LENGTHENING IN PERIPROSTHETIC FRACTURES OF THE FEMUR: 100 CONSECUTIVE CASES

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Introduction: Current treatment of fractures around hip implants has focused on locked plating in well-fixed stems, and revision to a long stem combined with plates, cerclage and grafting, or even total femoral replacement in loose stems. Aim of our study was to design a technique of less invasive intramedullary fixation in periprosthetic fractures and deformities of the femur to provide primary stability of the stem and the femur. Methods: A solid titanium femoral locked nail was designed features tight fit of the distal part of the femoral stem. Since 2007, fixator-assisted internal fixation was used in the treatment of 100 consecutive cases of femoral periprosthetic fractures and nonunions: Vancouver ALT - 1; Vancouver B1 - 29 cases (12 cemented) ; Vancouver B2 - 34 (3 cemented), B3 - 25 (4 cemented), C - 11 (3 cemented). Nine (9%) admitted with failures of previous plating. A simplified Ilizarov frame was used to gain alignment and length. Results: 78 patients (78%) were available for follow up in 1 year. 75 (96%) healed (6 after secondary procedures). Three have asymptomatic nonunion. In 43 cases of non-cemented loose stems available for follow-up healing occurred along with stem re-integration. Discussion and Conclusion: For elderly patients with severe comorbidities the technique provides less invasive treatment option with rapid recovery. Immediate unrestricted weight-bearing appears safe regardless of stem loosening. The current approach with plating in stable stems and revision in loose ones can be replaced by the introduced approach in vast majority of cases.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49821

ANALYSIS OF RISK FACTORS FOR RE-NONUNION IN PATIENTS WITH NONUNION FOLLOWING PRIMARY REVISION SUBSEQUENT TO TIBIA SHAFT INTRAMEDULLARY NAILING

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Introduction: To explore risk factors for re-nonunion in patients with nonunion following primary revision subsequent to tibia shaft intramedullary nailing. Method: Retrospective analysis is conducted on clinical data of 52 patients with nonunion following primary revision subsequent to tibia shaft intramedullary nailing admitted during the period from January 2012 to January 2017. Based on the diagnostic criteria of re-nonunion, such included patients are divided into the re-nonunion group (18 cases) and non-re-nonunion group (34 cases). One-way analysis of variance and multi-factor analysis of variance are conducted on 13 risk factors for re-nonunion in patients with non-union following primary revision subsequent to tibia shaft intramedullary nailing, including age, sex, smoking, drinking, body mass index, injury causes, fracture type, type of intramedullary nail, nonunion time, nonunion site, nonunion type, primary revision approach and autogenous bone graft is conducted. Result: One-way analysis of variance shows that smoking, body mass index, nonunion site, primary revision approach and autogenous bone graft are related risk factors for re-nonunion in patients with nonunion following primary revision subsequent to tibia shaft intramedullary nailing. Multi-factor unconditional Logistic regression analysis shows that autogenous bone graft and primary revision approach are independent risk factors for re-nonunion in patients with nonunion following primary revision subsequent to tibia shaft intramedullary nailing. Conclusion: Primary revision approach and autogenous bone graft are independent risk factors for re-nonunion in patients with nonunion following primary revision subsequent to tibia shaft intramedullary nailing.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49755

**FAST-TRACK SURGERY FOR PERTROCHANTERIC FRACTURES:
WHAT IS THE IMPACT ON THE LENGTH OF HOSPITAL STAY?**

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Our hypothesis is that Fast-Track (FT) surgery for pertrochanteric fractures (PTF) is possible and decreases the Average Duration of Stay (ADS) without compromising the quality of patient care. We conducted a prospective monocentric observational comparative study from January 2014 to 2016. We included patients with an isolated A1 or A2 (AO classification) PTF. Patients in FT group received surgery and were admitted the next in Rehabilitation Center (RC). Patients in the conventional group were postoperatively initially managed in our department before being transferred to the same RC depending on availability. Surgery performed : closed reduction internal fixation osteosynthesis by intramedullary nailing. Our aim was to evaluate FT management by comparing Global ADS (GADS = hospital ADS + RC ADS). Secondary objectives were survival and postoperative complications. 109 patients initially, 54 after pairing. FT group (n=27) had a RC ADS of 45 days (standard deviation : 19 days) with an GADS of 49 days (standard deviation : 19 days). Conventional group (n=27) had a RC ADS of 68 days (standard deviation : 41 days) with an GADS of 78 days (standard deviation : 48 days). RC ADS and GADS were significantly lower in the FT group (p=0.0022, p=0.002). No significant link was found regarding mortality or complications. FT patient management could become a valid model for trauma patients, similarly to the way it is growing trend for orthopaedic procedures, as it reduces GADS without compromising the quality of patient care. The first cost-related studies are also in favor of FT management.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49655

RESULTS OF REVISION SURGERY FOR BISPHOSPHONATE RELATED ATYPICAL FEMUR FRACTURE NONUNION

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Background: Bisphosphonates are widely used and linked to atypical femur fractures, leading to a poor biological environment for fracture healing. Intramedullary nailing is a first line treatment for these fractures but often result in non-union. There is no published paper in the literature on the management of these fractures when nailing has failed. We present our experience with this challenging problem. Methods: We have retrospectively reviewed all consecutive patients who underwent revision surgery for non-union of bisphosphonate related subtrochanteric fractures in a large teaching hospital between 2012 and 2017. A single surgeon performed all procedures, which included removal of failed metalwork, resection of non-union, bone grafting and rigid fixation with double plating with a lateral DCS plate and anterior compression plate. Results: This study included 10 patients (9 female, one male), average age at revision surgery was 71.5 years and average BMI was 34. Average duration of bisphosphonate treatment was 6.2 years. One patient was lost to follow up, three patients have not completed the final follow up yet. Average time for non-weight bearing (NWB) mobilisation was 6 months and average time for fracture union was 15 months. In all patients bony union of the subtrochanteric fracture was achieved. The average neck shaft angle improved from 121 to 132 degrees after revision surgery. Complications included two periprosthetic fractures, two cases wound infections and pressure sore. Conclusion(s): Fracture healing can be achieved with bone grafting and compression plating in all patients. However, prolonged NWB and follow-up duration is necessary.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52336

A COMPARATIVE STUDY OF RESULTS OF TREATMENT OF DISTAL FEMUR FRACTURE BY RETROGRADE NAIL VERSUS LOCKING COMPRESSION PLATE OUTCOME STUDY

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Background: Distal femur fractures represent between 4 to 6% of all femoral fractures. Both retrograde IM nails and locking compression plates are used with good success. Aim: The aim of this study is to compare clinical and radiological outcomes of retrograde IM nailing and locking compression plate for treating distal femoral fractures. Materials and Methods: In a prospective study from February 2014 to October 2015, we analysed 60 patients of distal femur fracture treated by retrograde IM nailing (30) (RN group) and LCP (30) (LCP group). Mean age in the two groups was 52.03 yrs (21- 80yrs). Majority of the patients were males in both the groups. Mechanism of injury was high energy impact in 37 patients and low energy impact in 23 patients. According to AO classification there were 24 type A fractures (RN=16, LCP=8) and 36 type C fractures (RN=14,LCP=22). 13 cases of RN group and 14 cases of LCP group were compound fractures. Results: In RN group, 2 out of 30 patients while in LCP group 1 out of 30 patients developed non-union. Additional secondary bone grafting was required 3 months after the primary operation in 2 patient in RN group and 1 patient in the LCP group. 1 patient in the RN group and 2 in LCP group had superficial infection while overall results according to Schatzker and Lambert criteria were better with LCP as compared to retrograde nail.

Date: 2018-10-11

Session: Trauma Free Papers (Lower Limb)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52264

TOTAL HIP ARTHROPLASTY IN POLYTRAUMA PATIENTS: A PROSPECTIVE

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Introduction: Polytrauma cases are on the rise in today's fast paced life. Patients may present with significant fracture of the pelvis, acetabulum and hip along with organ and musculoskeletal injuries. Surgery for such cases is technically demanding and aimed at joint preservation. Some hip joints are not salvageable and may be considered suitable for total hip and reconstruction procedures (THAR). We discuss a single surgeon series of complex total hip procedures performed at a busy level I trauma center. Materials and Methods: We retrospectively reviewed twenty-three consecutive cases of complex total hip arthroplasty /reconstruction performed at our institute on patients who presented with polytrauma. Results: In a three-year period, 12 cases were operated on during the initial presentation and 11 patients had delayed surgeries (3-168 months). Average age of the patient was 60.9 years (range 40-83 years). There were 14 females and 9 males. There were no cases of in-hospital mortality during initial presentation or during hospitalization for delayed surgery. All patients reported good functional outcomes despite complications. 6 patients developed DVT. 4 patients developed heterotrophic ossification, one patient had restricted range of motion. One male patient underwent debridement and retention of implant (DARI) and aggressive antibiotic therapy for early wound drainage and deep infection. Post-traumatic arthritis was the primary indication for delayed THAR. Conclusion: Total hip arthroplasty and reconstruction is a reasonable option for polytrauma patients. Treatment is aimed at early rehabilitation to avoid bedridden complications. Appropriate timing and meticulous planning with multidisciplinary team is the key to success.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52691

**KEYNOTE LECTURE: FIVE DECADES EXPERIENCE IN VTE
PROPHYLAXIS**

Eduardo SALVATI

, . (UNITED STATES)

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50595

MATCHED DUAL MOBILITY VERSUS STANDARD PE ON THE CONTRALATERAL HIP: A MEAN TEN-YEAR STUDY

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Introduction: we done the hypothesis that a difference in dislocation rate would be easier to observe in a population of patients with primary bilateral THA (dual mobility on one side and the contralateral standard cup) performed by the same surgical team. We reviewed 192 patients (384 hips) who had surgery between from 2000 to 2010. Methods: all the cups were dual mobility on one side and standard polyethylene (PE) cup on the contralateral side. We evaluated dislocations, clinical and radiographic results, and rates of revision, reason of revision, osteolysis and survival of the THA. Osteolysis was measured as a surface on anteroposterior pelvic X-rays and the comparison between the two sides was performed on hip radiographs at the same minimum followup of 8 years from the implantation as follow: presence or not of osteolysis and when present which side had the larger surface. Results: with dual mobility cup only one dislocations were observed (0.5%) at 8 years followup; in absence of dual mobility cup the same patients had a significant higher number of dislocation (17 of the 192 hips; 7.8 %) on the contralateral side at the same followup. Recurrent hip dislocations were only observed with standard PE liners cups and 12 hips (6.2%) with late recurrent dislocations were successfully treated with a dual mobility. Other causes of revision (2%) were similar in both groups. 52 hips had small osteolytic lesions on the calcar: the surface similar on both sides in 34 patients, higher on the conventional PE side in 14 patients and higher on dual mobility side in 4 patients. Discussion and conclusion: when the contralateral hip of the same patient is the control, our results indicate that at a minimum 8 years followup dual mobility bearing cups decreased the cumulative risk of dislocation.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52280

SAFETY AND FEASIBILITY OF SAME-DAY TOTAL HIP ARTHROPLASTY: A RETROSPECTIVE, SINGLE-CENTRE OBSERVATIONAL STUDY IN 116 PATIENTS

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Background: Length of hospital stay (LOS) following Total Hip Arthroplasty (THA) has been markedly reduced and same-day THA (SD-THA) was recently introduced. Satisfactory safety and patient reported outcomes have been reported, but more European studies, and studies where surgery is performed using a posterolateral approach, are needed to provide data that may establish safety and feasibility of SD-THA in these patient groups. Purpose: To evaluate safety and feasibility of SD-THA in a Danish population. Materials and methods: Consecutive patients scheduled for SD-THA between October 2015 and June 2016 were included. Inclusion criteria were primary THA, motivation for a same-day procedure, age >18 years, ASA I or II, and the presence of a support person who remain with the patient 24 hr. after surgery. Posterolateral surgical approach was used. Data were collected retrospectively from hospital records and the Danish National Patient Registry. Outcome measures were; complications during admission, LOS, causes of delayed discharge, prevalence of readmission and mortality at 90-day follow-up. Results: Of 669 elective THA patients, 116 were scheduled for SD-THA. 102 of 116 (88 %) were discharged the day of surgery, as planned. The remaining 14 patients were discharged the day after surgery. Primary causes of delayed discharge were: dizziness/nausea, pain and wound seepage. No serious complications occurred during admission. At follow-up, three patients (2.6%) had been readmitted due to pneumonia, wound infection and dislocation, respectively. There were no fatalities. Conclusions: The results indicate that SD-THA is feasible and safe in a selected group of patients.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52607

BILATERAL TOTAL HIP ARTHROPLASTY: ONE-STAGE VERSUS TWO-STAGE PROCEDURE

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Introduction: Despite several studies, controversies prevailed about the rate of complications following one-stage and two-stage bilateral total hip arthroplasty (THA). In current prospective study, we compared the complications and functional outcomes of one-stage and two-stage procedures. Methods: One hundred and eighty patients (ASA class I or II) with bilateral hip osteoarthritis were assigned randomly to two equal groups. Two groups were matched in term of age and sex. All of the surgeries were performed through the Harding approach using uncemented implants. In two-stage procedures, surgeries were performed with 6 months to one year interval. All patients were evaluated one year postoperatively. Results: The Harris hip score averaged 84.1 ± 12.6 and 82.6 ± 15.3 in one-stage and two-stage groups, respectively ($p=0.528$). The hospital stay was significantly longer in two-stage group (9.8 ± 1.1 versus 4.9 ± 0.8 days). The cumulative hemoglobin drop and number of transfused blood units were the same. One patient in each group developed symptomatic deep venous thrombosis and managed successfully. There was no patient with perioperative death, pulmonary embolism, infection, dislocation, periprosthetic fracture or heterotrophic ossification. No patient required reoperation. Two patients in one-stage group developed unilateral temporary peroneal nerve palsy resolved after 3 and 4 months. Conclusion: The current study showed that one-stage bilateral THA can be used successfully for patients who require bilateral hip arthroplasty without increased rate of complications. The functional and clinical outcomes are comparable and hospital stay is significantly shorter. However, the authors recommend to perform one-stage bilateral THA for healthy patients with ASA class I or II.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50691

TOTAL HIP ARTHROPLASTY FOR THE ADULT DYSPLASTIC HIP: A FORMULA FOR ESTIMATION OF AGE AT PRIMARY THA BASED ON INDIVIDUAL HIP JOINT GEOMETRY

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Introduction: Untreated developmental dysplasia of the hip (DDH) frequently causes activity-related groin and hip pain in young adults and increases their risk of early-onset osteoarthritis (OA). Affected patients demand information on the time course for progression of symptoms and on therapeutic options. This analysis aimed at devising a formula that allows for estimation of the approximate chronological age at the time of primary total hip arthroplasty (pTHA) based on individual joint geometry. Methods: All patients who underwent pTHA for OA secondary to DDH between 2005 and 2014 at our institution were considered for inclusion in this retrospective study. Prerequisites for inclusion were CE-angle<30°, AC-angle>10°, a spherical femoral head and congruent joint fit. Arthro-geometry measurements were performed using standard preoperative X-rays and included multiple joint parameters. Correlation and multiple linear regression analyses were performed to determine the impact of these parameters on age at pTHA. Significance was set at p=0.05. Results: 129 hips of 105 females and 15 males were included in this study. Median age at pTHA was 52 years (15-78). Painful functional deficit preceded joint replacement by a mean of 12.2 (±15.1) years. Age at pTHA correlated statistically highly significantly with CE-(0.37), AC-(-0.29) and Sharp-(-0.3) angles and with severity of dysplasia (0.32) (p<0.001). The CE-angle was identified as the independent variable with highest significance in predicting age at pTHA. Employing multivariate linear regression analysis this formula for estimation of the approximate chronological age at pTHA was devised: age at pTHA (years)-f[CE-angle]=40.2+0.8×CE-angle-0.01×(CE-angle)². Conclusion: The presented data further establish the link between adult dysplastic hip joint geometry as measured in plain radiographs and chronological age at pTHA. The devised formula may serve as an evidence-derived.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51615

DIRECT ANTERIOR VERSUS POSTERIOR MINIMALLY INVASIVE APPROACH FOR TOTAL HIP ARTHROPLASTY: A MULTICENTRE PROSPECTIVE RANDOMISED CLINICAL STUDY

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Background: The aim of this study was to compare two minimally invasive approaches in total hip arthroplasty: the direct anterior and posterior approaches. Hospital stay, functional outcome, pain, surgical time, implant position, and complications were analyzed. Method: In this prospective randomized multicenter clinical study, 55 patients (28 anterior, 27 posterior) were enrolled between February 2011 and July 2013 with an average follow-up of 55 months. Hospital stay, surgical time and complications were documented. Follow-up was sampled at 2 weeks, 4 weeks, 3 months, 6 months, 1 year, 2 years and 5 years postoperatively. Harris Hip Score and Visual Analog Scale were used to monitor functional outcome and pain. Radiological analysis was used to assess implants position. Results: Length of stay, functional outcome and pain assessment were similar for both approaches. There was a trend towards better outcome in the first three months, with a peak at 4 weeks (Harris Hip score: 76 vs 68; P=0.077) postoperatively for the direct anterior approach group. The average surgical time for the direct anterior approach was significantly longer (59.9 vs 45.7 min; P=0.002). Conclusion: The direct anterior approach for total hip arthroplasty appears to be a safe and effective option. However, there is no significant clinical advantage in hospital stay or postoperative recovery between the two approaches.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51490

CERAMIC-ON-POLYETHYLENE BEARING USAGE IN PRIMARY THA IS ASSOCIATED WITH REDUCED READMISSION RISK FOR THE MEDICARE POPULATION

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We hypothesized that unplanned readmissions, which are caused by infections and dislocation, may be reduced with ceramic bearing usage. 245,077 elderly patients (65+) who underwent primary THA between 2010 and 2015 with known bearing types were identified from the Medicare 100% inpatient database. Outcomes included relative risk of 30- and 90-day readmission. Propensity scores were developed to adjust for selection bias in bearing selection at index surgery. Cox regression incorporating propensity score stratification (10 levels) was used to evaluate the impact of bearing selection on outcomes, after adjusting for patient-, hospital-, surgeon-related factors, as well as the year of surgery. With C-PE bearings, the unadjusted (crude) 90-day readmission rate decreased from 8.7% in 2010 to 8.3% in 2015. For COC bearings, the crude 90-day readmission rate decreased from 10.5% to 9.1% from 2010 to 2015. After adjustment, year of surgery was associated with reduced readmission risk for both types of ceramic bearings in 30-day readmissions ($p < 0.05$) and COC in 90-day readmissions ($p < 0.001$). We also found that C-PE bearings were associated with significantly reduced readmission risk relative to M-PE at 30 days (hazard ratio, HR: 0.91, $p < 0.001$) and 90 days (HR: 0.93, $p < 0.001$). We believe this is the first study to demonstrate an association between THA implant characteristics (in this case C-PE bearing usage) and reduced readmission rates in this context along with patient- and clinical-related factors. The readmission rates for COC were found to be comparable to M-PE.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50780

**SQUEAKING CERAMIC-ON-CERAMIC TOTAL HIP ARTHROPLASTIES:
3D ANALYSIS OF CT SCANS**

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Objectives: The primary aim of this study was to investigate if implant positioning following total hip arthroplasty (THA) is linked to noise generation. The combined anteversion, calculated by adding the acetabular and femoral anteversion, was of particular interest. Non-operated hip joints on the contralateral side were also measured. The secondary aim was to establish a database for future research on noisy hip prostheses. **Methods:** A group of 20 patients with noisy THA was compared to a control group of 21 patients. Hectec mediCAD hip 3D® software was used to measure implant position from CT scans. **Investigated prostheses:** DePuy Synthes Corail® stem and Pinnacle® cup with ceramic-on-ceramic bearings, implanted at the Department of Orthopaedics and Trauma, Medical University of Graz from 2005 to 2012. **Statistical analysis:** Chi-squared test and t-test were performed with IBM SPSS Statistics, Version 20. A p-value of < 0.05 was considered to be statistically significant. **Results:** The statistical analysis did not show a significant correlation regarding implant position, demographic data or radiological assessment. A significant difference was found when comparing the natural hip joints. The case group had higher combined ($p = .029$) and acetabular ($p = .046$) anteversion angles, but the available data was limited due to a small case number (case group $n=11$, control group $n=6$). **Conclusions:** There was no significant difference regarding combined anteversion between the groups. For patients with exceptional anatomical properties, a standardized anatomical reconstruction with prosthesis implantation might result in suboptimal biomechanics, which subsequently leads to a higher incidence of noise.

Date: 2018-10-11

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Room: Room 518a+b

Abstract no.: 52153

SHORTENED STEM IN PRIMARY TOTAL HIP ARTHROPLASTY AT A MINIMUM FIVE-YEAR FOLLOW-UP: A MULTICENTRE SERIES OF 220 CASES

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Introduction: Today short stems are more and more used in total hip arthroplasty. But there are a lot of different short stems and learning curve and results are not so good according the registers and the publications. Among these short stems, there is a specific group called shortened stem and the aim of these study is to show that shortened stems have a learning curve and results equivalent at standard stem. Methods : We analysed a continue and multicentric (2 centers) series of 213 patients (220 primary THA) with an average age of 70 years and a minimum follow up of 5 years. The stem used was a shortened stem straight, cementless coated by a bilayer titane-HA and with a collar and with a femoral head angle of 130°. This series benefited of statistic analysis with Kaplan Meyer survival curve. Results: It's a continue series, 61% women, 82% of osteoarthritis, 9,5% of necrosis, 3,6% of dysplasy, 1% of rheumatoid. 27 patients were dead at the last follow up (12,2%) and 19 (8,3%) lost of follow up. 3 intraoperative fractures (1,3%) but no revision. The radiologic study showed 1 subsidence and 2 varisations during the 3 first months, stabilised at 1 year. No stem revision and 3 cup revision for loosening. The Kaplan Meyer survival curve for failures all type was 98.4% and for revision for stem loosening was 100% at 6.3 years. Discussion: The study of national registers and international literature about short stems don't show a satisfactory survival rate. However the results of shortened stems are like the standard stems. Our results go on the same way. Conclusion: These mid term results are important and we continue to use shortened stem for everybody except in coxa valga.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52218

ARE RESULTS OF DUAL MOBILITY CUP IN A YOUNG AND ATHLETIC POPULATION IDENTICAL TO THOSE OF AN OLDER ONE?: A COMPARATIVE SERIES OF DMC IN PATIENTS UNDER 55 YEARS OLD OVER 12 YEARS FOLLOW-UP

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Introduction: Long term results of dual mobility cup has demonstrated its efficiency to prevent THA instability. For us it is necessary to demonstrate that implant improvement might authorize us to widen DMC indications. Methods: Since 1998, our team has been using DMC in all THA cases. We report: 1- clinical and radiological outcomes of a more contemporary DMC performed in a young and athletic population (YAP), under 55 years old with a minimum follow up of 12 years. (n=85, 2000-2005: group 1). We consider as YAP: patients still less 55y with a DEVANE score 4 and 5 at minimum 1 y post op. 2- we compare these results (after a statistical analysis), to a series of patients aged over 55 years undergoing the same implants in the same conditions with also a minimum follow up of 12 years (n=444, 2000,2002; group 2). Results: The mean FU was 12 years. The rate of lost to FU was respectively 5.8% with a mean age of 49.9 y, in-group 1 and 8.1% with a mean age of 72.3 y in-group 2. There was no dislocation. All clinical scores were improved after THA but no differences could be found between the 2 groups. The survival rate relating to acetabular component revision was 94.7% for YAP and 98.4% for oldest one at 14 y (p: less 0.05) no different statistically. Discussion: These results are in the same agreement than those of the literature for a category of high demanding performance patients for their implants (Ceramic on Ceramic and Low Friction Arthroplasty). Wear process is still a concern, we didn't observe increase rate of wear in the 2 groups. Conclusion: The DMC for young and athletic patients is a relevant surgical option with no dislocation.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51622

ARE OUTCOMES OF TOTAL HIP ARTHROPLASTY IN FEMORAL HEAD OSTEONECROSIS WORSE THAN IN PRIMARY HIP OSTEOARTHRITIS?

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The purpose of this study was to examine if a diagnosis of avascular necrosis (AVN) was associated with worse outcomes after total hip arthroplasty (THA) compared to primary hip osteoarthritis. Thirty-five patients (Group I) with AVN who underwent cementless THA between 2004 and 2012 were re-evaluated at a minimum follow-up of 2 years. A consecutive series of 35 patients with primary hip osteoarthritis was used as a control group (Group II). Follow-up included evaluation of implant survivorship, Harris Hip Score (HHS) and WOMAC score. The mean follow-up time was 6 years in Group I and 5 years in Group II. One case of deep venous thrombosis was detected in Group I. No others major complications occurred in both groups. No patient experienced aseptic loosening or required major revision in both groups. At follow-up no statistically significant difference between groups was detected evaluating functional outcomes: the mean HHS was 92.7 ± 11.2 in Group I and 90.9 ± 5.3 in Group II ($P = 0.4901$); the mean WOMAC score was 93.2 ± 7.6 in Group I and 91.9 ± 4.6 in Group II ($P = 0.5101$). In the past, THA outcomes were reported to be poorer in osteonecrosis than in other hip diseases. Recent studies show that THA survival in AVN has improved markedly, up to the values seen in THA for osteoarthritis. Our results show excellent scores similar in both groups suggesting that cementless THA in patients with AVN is a safe and effective procedure with good to excellent outcomes comparable to those of patients with hip osteoarthritis.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52473

TOTAL HIP ARTHROPLASTY USING DUAL MOBILITY CUP IN PATIENTS WITH OSTEONECROSIS OF THE FEMORAL HEAD

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Introduction: Osteonecrosis of the femoral head (ONFH) remains a therapeutic challenge for patients undergoing total hip arthroplasty (THA). The fact that these patients are young with high functional demand, their risk of dislocation following surgery is higher than patients with osteoarthritis. The use of double mobility cup (DMC) has been linked with lower rates of complications when compared to conservative cups; however, the literature is scarce over DMC results in patients with ONFH. The aim of the study is to report the early outcomes of patients with ONFH treated with THA-DMC. Materials and Methods: A retrospective analysis of patients suffering from ONFH whom underwent THA using DMC (THA-DMC) from 2006 to 2015 were evaluated for functional status and risk of post-operative complications. Thirty THA-DMC in 26 patients with a mean follow-up of 51 months were evaluated clinically (modified Hip Harris Score) and radiologically. Results: The mean age of patients included was 54.9 years. At final follow-up, the mean modified Hip Harris score was 98.7 ± 2.7 and the radiological assessment revealed no signs of migration/tilting, radiolucent lines, periprosthetic osteolysis or heterotopic ossification over the DMC component and the femoral stem. The survival rate over 41 months of follow-up is 100% with no episodes of dislocation or revision. Conclusion: The use of the new generation of dual mobility cup in patients with ONFH showed excellent functional and radiological results with no episode of dislocation.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50877

PATIENT-DEPENDENT RISK FACTORS FOR SELF-PERCEIVED LEG-LENGTH DISCREPANCY AFTER TOTAL HIP ARTHROPLASTY

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Introduction: Patients with equal objective leg-length discrepancy (LLD) may have different subjective perceptions of this condition. Our aim was to analyze the effects of gender, age, operated side, body height, body mass index and objective LLD measurements on self-perceived LLD after total hip arthroplasty (THA). Methods: Retrospective observational study included 159 patients with unilateral primary THA at a single institution, who answered the question "Do you feel after THA Your legs are equally long? YES/NO". The data on their gender, age, body height, body mass index (BMI), absolute/relative/pelvic radiographic LLD measurements were included in multivariate logistic regression analyses with self-perceived LLD as the binary dependent variable. Results: Out of 159 participants, 62 (39 %) subjectively perceived postoperative LLD while the remaining 97 reported equal leg lengths. The two groups differed in the clinically measured postoperative relative LLD (mean 11 mm vs. 8 mm; $p = 0.01$) and postoperative WOMAC scores (460 mm vs. 220 mm; $p < 0.01$) but not in the absolute or pelvic radiographic LLD. After adjustment for gender, age and operated side, postoperative relative LLD (odds ratio 1.07 each mm; 95% CI 1.02-1.12) and body dimensions BMI < 26 kg/m² & body height < 1,75 m (odds ratio 2.39; 95% CI 1.11-5.16) were the only independent risk factors for self-perceived LLD. Conclusion: Clinical relative LLD measurements are better predictors of self-perceived postoperative LLD than pelvic radiographic measurements. Patients with smaller body dimensions will more likely report subjective leg length inequality at a given objective LLD, regardless of gender or age.

Date: 2018-10-11

Session: Hip Free Papers (Primary THA)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 49802

MID-TERM RESULTS OF METAPHYSO-DIAPHYSEAL FIXATION USING A NOVEL UNCEMENTED SHORT FEMORAL STEM IN THA

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Introduction: Short stems were developed with the promise of easier implantation, facilitating revision, reducing thigh pain and avoidance of proximal stress shielding. The aim of this study is to present the early clinical results of the Profemur Preserve stem (MicroPort Orthopaedics Inc.). Methods: This is a prospective case series of 310 THAs performed on a series of 292 patients using Profemur Preserve stems. Three surgeons, in two centres, operated on the patients using either the mini posterior or anterolateral approach. The primary outcomes were stem revision for aseptic loosening, and all-cause stem revision. Clinical and radiographic outcomes were also assessed. Results: Of the 310 total THAs, 285 arthroplasties were retained in this study, with 25 (8.1%) lost to follow-up. There were 118 males and 174 females, with an average age of 62.8 years at surgery. At final follow-up, at a mean of 57 months, there were no cases of stem aseptic loosening. There was one stem revision performed for a late periprosthetic fracture. Radiographic analysis demonstrated no cases of stem subsidence. The WOMAC score was 8.6 (range: 0-56) compared to 54.5 (range: 8-88) pre-operatively. There was no thigh pain reported. Conclusion: The Profemur Preserve stem, produced excellent clinical and radiological results at a minimum of 4-year follow-up, with 99.6% implant survival for all-cause revision and no revisions for aseptic loosening. Long-term results are required to further evaluate the stem's promising early results.

Date: 2018-10-11

Session: Hip Free Papers (Hip Fractures)

Time: 16:00 - 17:30

Room: Room 518a+b

Abstract no.: 52423

TREATMENT OF 118 UNSTABLE INTERTROCHANTERIC FRACTURES IN THE MORBID ELDERLY WITH CEMENTLESS HIP ARTHROPLASTY: RISK-BENEFIT ANALYSIS AND COMPARISON WITH A CEMENTED COHORT

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Introduction: Elderly morbid patients with unstable intertrochanteric fractures need exacting treatment. Bipolar hip hemiarthroplasty (BHA) as a primary procedure provides early pain relief and faster rehabilitation. Though cemented stems permit immediate weight bearing, fatal cement embolism is a risk. We present a retrospective risk-benefit analysis of cementless bipolar hemiarthroplasty in 108 consecutive patients, and their head-to-head comparison to a similar cemented cohort. Methods: Hospital records of elderly patients (age>70yrs) with unstable intertrochanteric fractures were retrospectively reviewed (over a 10-year period). Patients with >2 medical comorbidities (ASA grades III and IV) were included. Of 318 records (of 271 patients), records of 100 patients (118 cementless BHAs) were analysed for operative data (surgical time, blood loss requirements), intra- and peri-operative events (minor, major non-fatal, fatal medical & surgical complications) & re-surgery rate (any cause). These were statistically compared to observations from a matched cemented BHA group. Results: Surgical times and blood loss (& requirements) were statistically comparable. Our cementless BHA group had a higher minor intra-operative surgical complication risk but a lower major intra- and post-operative medical complication risk compared to the cemented group. Discussion: Risk-benefit analysis of our series favours the use of cementless stems to prevent high rates of peri-operative mortality and morbidity, without any adverse impact on early rehabilitation.

Date: 2018-10-11

Session: Hip Free Papers (Hip Fractures)

Time: 16:00 - 17:30

Room: Room 518a+b

Abstract no.: 51748

PROSTHETIC REPLACEMENT IS BETTER THAN OSTEOSYNTHESIS IN INTERTROCHANTERIC FRACTURE FEMUR IN THE ELDERLY: A PROSPECTIVE RANDOMISED BLINDED STUDY

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Introduction: Despite plethora of treatment options available, treatment of intertrochanteric fracture femur in elderly is still a matter of debate. Purpose of study was to compare clinico-radiological outcomes of intertrochanteric femur fractures in elderly patients treated with Prosthetic replacement and Osteosynthesis. Methods: In a prospective randomized blinded study, 61 patients of elderly intertrochanteric fracture femur were randomized into: Group I (Prosthetic replacement) and Group II (Osteosynthesis). 32 patients underwent Bipolar Hemiarthroplasty while 29 were managed by Proximal Femoral Nailing. Patients were followed up clinico-radiologically at 6, 12, 24 weeks and final follow up (mean: 8.68 months; range: 6-17 months). Demographics such as duration of surgery, amount of blood loss, day of independent ambulation and return to activities of daily living and functional scores like Harris Hip score (HHS), Visual Analogue scale (VAS), Elderly Mobility Scale (EMS) were measured. Radiological Union Score for Hip (RUSH) score was estimated for osteosynthesis group. Results: Mean age was 69.41 and 75.41 years in bipolar and osteosynthesis group respectively. Mean duration of surgery (63.75 Vs 106.9 mins; $p=0.000$), mean blood loss (252.50 Vs 246.20 ml; $p= 0.539$) and mean duration of hospital stay (8.22 Vs 12.44 days; $p=0.000$) was lesser in Bipolar group. Difference in mean HHS was statistically significant at all follow ups. Bipolar group had higher EMS scores and lower VAS scores. Fewer complications were observed in bipolar group. Conclusion: Bipolar hemiarthroplasty is a better modality of treatment in intertrochanteric fracture in the elderly with early mobilization, better functional outcome, and lower morbidity.

Date: 2018-10-11

Session: Hip Free Papers (Hip Fractures)

Time: 16:00 - 17:30

Room: Room 518a+b

Abstract no.: 51146

ACUTE VERSUS DELAYED TOTAL HIP ARTHROPLASTY IN ACETABULAR FRACTURES

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Introduction: Results of open reduction and internal fixation of acetabular fractures in old patients are suboptimal. Total hip arthroplasty (THA) is a reliable option in this patient population, immediately after trauma, or secondarily as a treatment of posttraumatic osteoarthritis. The aim of the study was to compare survivorship, clinical and radiological outcomes of acute vs. delayed THA for acetabular fractures. Methods: A retrospective review in a single academic institution was conducted between 2004 and 2014. We identified 291 patients with an acetabular fracture of which 60 patients had a THA. We had 23 patients in the acute group and 39 in the delayed group. Three months after the trauma was used as cutoff. Clinical scores (Harris Hip score [HHS], Postel Merle d'Aubigné [PMA] and Oxford Hip score [OHS]), radiological implant survival, and operative data were compared. Mean follow up after THA was 5 years (range, 2 to 13 years). Results: The survivorship free of aseptic loosening was 91% in the primary THA group and 95% in the secondary THA group. Clinical scores (HHS, PMA and Oxford) were significantly lower in the acute THA group ($p=0.01$, $p=0.01$ and $p=0.002$, respectively). Operative time, bleeding and transfusions were significantly higher in the primary THA group ($p=0.04$, $p<0.001$, and $p<0.001$, respectively), when compared to the delayed THA group. Conclusion: Acute THA after acetabular fractures had worse survivorship and clinical outcomes at 5 years of follow-up. Given the complexity of this surgery, specific indications for acute THA have still to be precised.

Date: 2018-10-11

Session: Hip Free Papers (Hip Fractures)

Time: 16:00 - 17:30

Room: Room 518a+b

Abstract no.: 50660

SURVEY ON THE ATYPICAL FEMORAL FRACTURES IN LONG-TERM BIPHOSPHONATE USE

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Introduction: In this study, the incidence of atypical femoral fracture (AFF) in patients with collagen disease who used bisphosphonates (BPs) were investigated. Method: From 2004 to 2015, 501 cases of collagen diseases who have been administrated BPs at least 2 years were enrolled. The mean age at the beginning of BPs, primary disease, types and administration period of BPs, use of glucocorticoid, and the episode of AFF were reviewed from the clinical records. AFF was diagnosed according to the definition of American Society for Bone and Mineral Research (ASBMR). Although this definition does not include peri-prosthetic fracture, we carefully investigated the cases who met the criteria of AFF with femoral implant as "AFF-like femoral fractures". Result: The primary disease was rheumatoid arthritis (RA) in 356 cases, other collagen diseases in 145 cases. There was no difference of types, the averaged administration period, and average starting age of BPs between RA and non-RA cases. Interestingly, we found no case of typical AFF. In cases with femoral implants, we found 3 cases (0.6%) of AFF-like femoral fractures. All of these cases were RA, and had the history of long-term BPs use, precursor thigh pain, use of glucocorticoid, and the event of minor trauma. Discussion and Conclusion: We found that the incidence rate of AFF-like femoral fracture was 1711/1 million person-year, which is much higher than the previous reports of AFF. We have to be careful for the RA cases of long-term use of BPs conjunction with glucocorticoid use and femoral implants.

Date: 2018-10-11

Session: Hip Free Papers (Hip Fractures)

Time: 16:00 - 17:30

Room: Room 518a+b

Abstract no.: 52209

IS DUAL-MOBILITY ARTICULATION A WISE OPTION FOR DISPLACED FEMUR NECK FRACTURE IN ELDERLY PATIENTS WITH NEUROMUSCULAR DISORDER?

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Neuromuscular disease is well known to be at increased risk of complications following hip replacement surgeries. However, there is little data regarding outcomes of dual mobility articulation in this disease entity. The purpose of this study is to evaluate performance of total hip arthroplasty (THA) using dual mobility articulation in displaced femoral neck fractures of elderly with neuromuscular disease. From January to August 2016, we prospectively evaluated 162 patients (162 hips) who underwent THA with dual mobility articulation. Of the 162 patients, 35 patients had neuromuscular disease including cerebral palsy, poliomyelitis, hemiplegia, paraplegia, dementia, and Parkinson disease (N-M group). The other 127 patients had no history of neuromuscular disease (Non N-M group). The mean age was 76.5 years (range, 60 – 95) and female ratio was 69.8% (125/179). The mean follow-up period was 50.4 months (39 – 62 months). Postoperative dislocation occurred in 7 of 162 hips (4.3%). In the N-M group, 2 (5.7%) experienced dislocation while in the Non-N-M group, 5 (3.9%) experienced dislocation ($p=0.348$). Closed reduction was initially successful only in 2 hips. In 3 hips, liner and head dissociation was developed during closed reduction. The remaining 3 hips were reduced with open reduction. Postoperative complications include intraoperative acetabular fracture in 6, periprosthetic femur fracture in 3 hips, and superficial wound infection in 2, and early cup loosening in 1 hip. In femoral neck fractures from elderly with neuromuscular disease, THA with dual mobility articulation yielded reasonable outcomes, comparable to those without neuromuscular disease.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52692

KEYNOTE LECTURES: WHY ARE KNEES FAILING IN 2018?

Gautam CHAKRABARTY

., . (UNITED KINGDOM)

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 50607

IMPROVEMENT OF FEMORAL CEMENT PENETRATION BY PRESSURE APPLICATION

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Femoral component loosening is a serious complication in knee arthroplasty and directly influenced by the cementation technique. The question was, whether the femoral cementation can be improved by pressure application. In a prospective laboratory study, implantation of a femoral component was performed in three groups of 9 sawbones each using different cementing techniques. Group A: Complete cement coverage of the component posterior surface and femoral surface; B: Coverage of the ventral and dorsal component surface and the complete femoral surface; C: Complete cement coverage of the component posterior surface as well as the entire femoral anchoring surface with a pressurizer. The mean cement penetration was evaluated after computed tomography using digital sections and the zone subdivision according to the Knee Society Scoring System. On the basis of two digital sections through the medial and lateral anchoring peg, the number of cases [N] per group was 18. The statistical evaluation was carried out by an ANOVA with a post hoc test (Bonferroni). In comparison of all groups, group C achieved a significantly higher cement penetration in all zones ($p \leq 0.01$). In comparison of groups A and B, the latter showed a significantly lower penetration in zones 2 and 5-7 ($p < 0.05$). The mean cement penetration in group C ranged between 2.6 and 5.4 mm. The use of a pressurizer leads to a significant increase in cement penetration in all anchoring areas. Furthermore, the amount of bone cement used has an influence on the penetration depth.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51387

**SIMULTANEOUS BILATERAL TOTAL KNEE REPLACEMENT:
PROSPECTIVE AND COMPARATIVE STUDY IN RELATION TO PATIENT
SELECTION AND SAFETY**

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Introduction: Simultaneous bilateral TKR (SBTKR) will be advantageous in terms of early functional recovery, reduced hospital stay and lower risks. However the complications involved with SBTKR always deter this procedure. Our aim of this study was to define patient selection criteria for SBTKR without compromise in safety. Methods: From January 2015 to January 2017, 84 SBTKR compared with age, sex matched population of 80 staggered TKR. The selection criteria for BSTKR are patients age under 70 years, BMI less than 30, only one comorbidity, no IHD /pulmonary disease, ASA grade 2 or less. Pre- and post-operative Knee Society Scores, complications, tourniquet times, blood transfusion rates were evaluated. Results: The mean follow-up was 1.8 years. SBTKR had a shorter cumulative anaesthesia time, less average length of stay and less cumulative average blood loss($p < 0.05$). Fall in haemoglobin and blood transfusion requirement is more in staggered group but not significant. Two cases of deep infection noted in staggered group but none in simultaneous group. Three cases of electrolyte imbalance in staggered group ($p < 0.05$). Average cost significantly less in simultaneous group ($p < 0.05$). The mean KSS improved from 39.48 ± 5.69 to 88.83 ± 5.82 ($P < 0.01$), with no statistical differences between the two groups ($P > 0.05$). Conclusion: SBTKR carries no risk in relation to intraoperative and post op parameters with low cost and good functional outcome if patients are selected according to the defined criteria.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 50790

TOTAL KNEE ARTHROPLASTY USING CRUCIATE RETAINING PROSTHESIS IN ARTHRITIC KNEES WITH ATTENUATED OR DEFICIENT PCL: MID-TERM RESULTS

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¹AIIMS, - (INDIA), ²AIIMS, NEW DELHI (INDIA)

Cruciate-retaining Total Knee Arthroplasty (CR-TKA) has got some undisputed benefits over Posterior stabilised (PS-TKA), however CR-TKA is traditionally being done only in minimally deformed arthritic knees with intact Posterior Cruciate Ligaments (PCL). Between January 2014 and April 2015, we performed CR-TKA on 117 knees in 77 patients with attenuated or deficient PCL. All the knees were severely deformed with one or more of the following conditions: Fixed Flexion deformity greater than 30, varus deformity greater than 30, valgus deformity greater than 10, hyperextension greater than 10, arc of motion less than 50, fibrous or bony ankylosis. The mean age at operation was 43.5 years (30-60) and 45 patients had inflammatory arthritis, 11 had post traumatic arthritis and 21 had osteoarthritis. The preoperative Hospital for Special Surgery Knee Score of 50 points was improved to 87 at the minimum final follow-up of 3 years. The mean range of active knee flexion improved to 102 degrees (82-134), mean fixed flexion deformity was 1.2 degrees (0-10) and the extension lag 1.6 degrees (0-10). Angular deformity was corrected to between 0 degrees and 8 degrees of valgus. There was no serious complication in any of the patients and no patient had complaints of instability at final follow up. Though 5 patients had necrosis at the skin edge and 3 had superficial infection, healing was achieved within 2 weeks. If balancing is achieved properly in both coronal and sagittal planes, even arthritic knees with attenuated or deficient PCL can enjoy the benefits of CR-TKA.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51642

MECHANICAL ALIGNMENT AND OUTCOME OF TOTAL KNEE REPLACEMENT IN OBESE PATIENTS USING MEASURED RESECTION AND INTRAMEDULLARY TECHNIQUE

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Introduction: Total Knee Arthroplasty is associated with increased complications and early implant failure in obese patients. The aim of this study was to assess the varus tibial component and its association with implant failure which needed revision. Material and Method: Retrospective analysis of 118 patients (130 knees) with Body Mass Index (BMI) more than 40 undergoing TKR between January 2010 and December 2012 was performed. There were 68 females and 50 males with average age of 66 years. Indication for surgery was Osteoarthritis in 90% of cases. All patients were operated using measured resection and intramedullary technique using the same approach and implant. Patients' demographics, BMI, range of movement, functional scores and radiological outcomes were evaluated. Results: Patients were followed up for an average of five years. Average Oxford Knee Score pre-operatively was 20.63 (14-24, SD 2.33) which improved post operatively to 58.6 (42-75, SD 6.67). The average coronal and sagittal alignment of the tibial component was 89.16 degrees (85-94) and 88 degrees (86-92). Range of motion increased from averaged 85° (65-130) preoperatively and to 103° (70-130) post-operatively. There were 14 revisions (10.7 %) for failure. Patients with more than five degrees of varus in standard tibial component had a tendency to collapse. Conclusion: This study highlights substantial improvement in functional scores and patient satisfaction following TKR in obese patients. Our recommendation is to avoid varus implantation of components and there may be a role for considering condylar constrained or stemmed implants to minimise failures in high BMI patients.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51795

DYNAMIC KNEE ALIGNMENT BEHAVIOUR AFTER TOTAL KNEE ARTHROPLASTY AIMING FOR A NEUTRAL MECHANICAL ALIGNMENT

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Background: Main school of thought in total knee arthroplasty (TKA) surgery aims at restoring a knee coronal mechanical alignment to neutral ($0^\circ \pm 3^\circ$). Although static alignment might be restored to neutral, the literature is scarce regarding its impact on gait dynamic alignment. Study objective is therefore to assess coronal plane knee dynamic alignment during gait after TKA aiming for a neutral mechanical alignment. Methods: Nineteen patients awaiting a TKA (7 males, 12 Females; mean age: 61 ± 5 ; mean BMI: 31.9 ± 4.2) were recruited. Participants underwent a standard three-foot standing X-ray and a three-dimensional knee kinematics assessment during treadmill gait preoperatively and twelve months after surgery. Results were compared to a control group of seventeen asymptomatic participants (11 males, 6 Females; mean age = 57 ± 8 ; mean BMI = 26.1 ± 4.2). Results: Mean radiographic mechanical alignment was corrected from $5.4^\circ \pm 5.0$ of varus preoperatively to $0.1^\circ \pm 2.0$ of valgus after surgery ($p=0.002$). Mean stance coronal plane kinematics decreased from $6.7^\circ \pm 4.0$ of varus before surgery to $2.1^\circ \pm 3.8$ after surgery ($P=0.001$). Correlation coefficients between mechanical radiographic axis and gait coronal plane alignment in control group reach $R=0.88$. Interestingly, this correlation was lower in OA group pre surgery to $R=0.41$, and even lower post TKA to $R=0.13$. Conclusion: Results show that TKA patients in which surgery successfully corrected mechanical alignment to neutral walked with significantly reduced dynamic varus alignment. Nevertheless, results demonstrate that correlation between static and dynamic alignment is not improved post surgery suggesting that static radiographic coronal alignment does not predict dynamic knee behaviour in TKA patients.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51785

A COMPARISON OF PATELLA RESURFACING VERSUS RETENTION IN TOTAL KNEE ARTHROPLASTY FOR PATIENT SATISFACTION AND PATELLAR CREPITUS AFTER SURGERY

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Background and purpose: Patellar crepitus after total knee arthroplasty (TKA) is not uncommon. Patella resurfacing or retention in total knee arthroplasty remains controversial. The aim of this randomized controlled trial (RCT) was to evaluate the efficacy of patellar resurfacing on the incidence of patellar crepitus and to investigate the clinical outcomes and of patients' satisfaction who underwent patellar retention or resurfacing. Patients and methods: From May 2014 to February 2017, 73 knees from 63 patients were randomized to receive patellar resurfacing or nonresurfacing total knee arthroplasty by one surgeon. Evaluation of 29 knees in resurfaced group and 44 knees retain their native patella were performed preoperatively and in the average follow-up period of 8.68 months using the Knee Society Score (KSS), KSS Functional and KOOS. Results: No significant difference was found between two groups in patient satisfaction, Knee Society clinical rating scores and KOOS and these scores shows improvement for both groups in follow up period. Patella crepitus were not statistically different between the two groups. Conclusions: In this study, No evidence was found to suggest patellar resurfacing in order to decrease patellar crepitus or affect the clinical outcome of a total knee arthroplasty.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51354

CORRELATION BETWEEN COMPONENT ROTATION AND FUNCTIONAL OUTCOME IN TOTAL KNEE ARTHROPLASTY: A PROSPECTIVE CT-BASED STUDY

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Introduction: Total Knee Arthroplasty (TKA) components malalignment can cause compromised functional outcome. Rotational malalignment not studied much as it requires CT (Computerized Tomography) scan. Our study purpose was to evaluate tibial and femoral component rotation by CT scan and correlate with functional outcome by Knee Society Score (KSS). Methods: Prospective study of 102 knees (80 patients) with posterior stabilised-TKA for osteoarthritis from August-December 2015 with one year follow-up. Mean age 62.2 years. Patients with anatomical defects and not willing were excluded. Rotational tibial angle (RTA) and rotational femoral angle (RFA) measured post-operatively. Knees divided into Group A ($< -3^\circ$, excessive internal rotation), B ($-3^\circ < 0^\circ < 3^\circ$, ideal), C ($> 3^\circ$, excessive external rotation) based on RTA. Group 1, 2 and 3 based on RFA. Group X (RFA, RTA abnormal), Y (RFA abnormal, RTA normal), Z (RTA abnormal, RFA normal) based on excessive external rotation. KSS at 1 year follow-up. Statistical analysis using SPSS (19.0) with ANOVA test. p value < 0.05 considered significant. Results: Group A, B, C had 1, 72, 29 knees respectively. No significant difference between B and C with mean knee score (p value=0.556), mean function score (p value=0.724). Group 1, 2, 3 had 0, 89, 13 knees respectively. Significant difference between 2 and 3 with mean knee score (p value=0.001), mean function score (p value < 0.001). Group X, Y, Z had 9, 4, 20 knees respectively. No significant difference between X and Y (p value=0.088), but significant difference between X and Z (p value=0.000) & also Y and Z (p value=0.007). Conclusion: Knees with femoral component malrotation had compromised functional outcome at one year.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51862

TO RETAIN OR NOT?: THE FATE OF PATELLAR REVISION IN PATIENTS WITH ASEPTIC PATELLAR COMPONENT LOOSENING

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Introduction: It has been hypothesized that patellar component loosening occurs when the femoral or tibial components are rotated or misaligned following total knee arthroplasty (TKA). Previous literature suggests that in order to successfully revise the patellar component, the femoral or tibial components require revision as well. The aims of this study were to identify the outcomes of patients who underwent patellar revisions due to aseptic loosening. Methods: A retrospective case series study was conducted on patellar component revisions due to aseptic loosening done between 2009-2017. Time points measured throughout patellar revisions included preoperative range of motion (ROM), 6-week and 6-Month follow-up ROM. Survivorship of the implant was followed for all patients beyond the 1 year follow-up. Results: 105 patients who underwent patellar component revision were included in the study. Patients were followed for a mean time of 4.3 years, ranging from 1.3 to 8.8 years. Mean age at surgery was 67.40 years. The average BMI was 33.71. Mean length of stay was 2.4 days. Hemoglobin decrease (g/dL) was 2.101 on average. Mean surgical time was 69.17 minutes. ROM was on average 110.3 degrees at the preoperative assessment, 115.3 degrees at 6-week, and 117.1 degrees at 6 months. None of the patient required further revisions. Conclusion: Isolated patellar component revision was successful for all followed patients, despite the tibial and femoral components being retained. None of the patients required further surgical intervention. Our experience shows no need to revise all components to treat discomfort and pain secondary to patellar loosening.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51965

THE AMOUNT OF PCL ACTUALLY RETAINED IN CRUCIATE RETAINING TOTAL KNEE ARTHROPLASTY AND ITS EFFECT ON FUNCTIONAL OUTCOME

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BACKGROUND: The length of PCL attachment that actually remains after Cruciate Retaining Total Knee Arthroplasty(CR TKA) is questionable. There is not much data that correlates the amount of PCL that is actually retained in CR TKA with its functional outcome. This study aims to calculate the actual amount of PCL that remains after CR TKA and correlate it with the functional outcome. **METHODS:** Prospective observational study was conducted on a total of 75 knees which underwent TKA with a common prosthesis (TRIATHLON, STRYKER USA). On each knee Pre operative evaluation of MRI for PCL facet length and PCL footprint length was calculated. Post operatively the amount of PCL resected in the tibial cut was measured using a digital calliper. Knee scoring was done pre and post operatively and the presence of correlation between the amount of PCL retained and clinical score was assessed. **RESULTS:** The overall mean length of PCL facet in the study population was 23.60mm out of which the mean length of PCL foot print was 11.42mm. Mean length of PCL tibial attachment that remained was 9.87mm (80.32%). There was no correlation between the amount of PCL retained and the functional outcome of the knees. **CONCLUSION:** A standard tibial cut resects a part of the tibial attachment of PCL along with it. It is clear that CR TKA does not retain all of the PCL. However our study proves that irrespective of the amount of PCL that is retained, the functional outcome remains unaffected.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52580

FIVE-YEAR FOLLOW-UP OF 285 VALGUS KNEE TOTAL KNEE ARTHROPLASTIES WITH GPS NAVIGATED EXACTECH OPTETRAK IMPLANTS

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In this study, 256 patients with 285 Exactech Optetrak total knee arthroplasty (TKA) implants were followed up at 5 year. Preoperatively, patient demographics (mean [SD]) were 85 male; age, 69.7 (8.7) years; ASA score, 2.5 (0.7); body mass index, 32.2 (5.7); 161° varus and 27° valgus; fixed flexion, 5.6° (6.1°); flexion, 96.1° (18.8°); and Oxford score, 43 (7.0). At 5 year follow-up, results were fixed flexion, 0.9° (2.6): maximum, 17°, minimum, 0°; flexion, 101.3° (9.1): maximum, 125°, minimum, 75°; and Oxford score, 23 (7.7). Radiographs showed radiolucent lines in 6 femurs in 1 zone; 1 in 2 zones and 0 in more than 2 zones; and 3 tibias in 1 zone. There were 2 deep infections. Ninety-eight percent of patients were satisfied with their TKA.

Date: 2018-10-11

Session: Knee Free Papers (Total Knee Arthroplasty I)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52233

LONG-TERM COMPARISON ON CLINICAL PERFORMANCE AND SURVIVORSHIP BETWEEN SINGLE RADIUS FIXED-BEARING AND MOBILE-BEARING TOTAL KNEE PROSTHESES IN THE SAME PATIENTS WITH SEVERE VARUS DEFORMITY

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Single radius design total knee prostheses have been introduced to provide joint stability and reduce patellofemoral contact stress. In addition, mobile-bearing design has an advantage of self-realignment with assumption that this would be helpful to reduce anterior knee pain. The purpose of this study is to compare clinical and radiographic results including patellofemoral complication rates between single radius fixed- and mobile-bearing prostheses in the same patients. A consecutive staged total knee arthroplasties were performed in 118 patients by single surgeon. All of the patients received a single radius fixed-bearing prosthesis on one side and a single radius mobile-bearing prosthesis on the contralateral side. The mean duration of follow-up is 11.2 years. Fifteen patients were excluded due to death or lost to follow-up. Of the 103 patients (206 knees), all femoral and tibia components were well-fixed without loosening at final follow-up except two knees. One knee with PE spin out underwent PE change with the thicker PE and one knee with deep infection underwent two-stage revision. One periprosthetic fracture underwent osteosynthesis with retrograde intramedullary nail. Knee society score (92 vs 93 points), range of motion (132.3 vs 134.5) and PVAS scores (2.1 vs 2.2) did not differ significantly between the fixed- and mobile-bearing designs at final follow-up. Patellofemoral complications including anterior knee pain also did not differ between the two groups. These findings suggest that both single radius fixed- and mobile-bearings yielded durable clinical and radiographic results. No differences were observed in patellofemoral complications between the two single radius designs.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50728

RESULTS OF OXFORD MOBILE BEARING MEDIAL UNICOMPARTMENTAL KNEE REPLACEMENT IN PATIENTS WITH TIBIA VARA

Vijay KUMAR¹, Naman WAHAL¹, Deep SRIVASTAVA¹, Hemant PANDIT²,
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The Oxford mobile bearing medial Unicompartmental Knee Replacement (OUKR) has shown excellent outcome and survival rates for anteromedial osteoarthritis of the knee. There is a high incidence of tibial Vara in Indian patients. The aim of this study was to study the results of OUKR in patients with tibial Vara. In a cohort of 200 UKR performed at our institute from 2008 to 2016 using minimally invasive technique, 112 knees had a tibial vara of more than 2 degrees. All patients were analyzed using Oxford Knee Score (OKS), 2011 Knee Society Knee Scoring System (KSS) and the Tegner Activity Level Scale (TAS). The average follow-up of 4 years (range, 1-8 years). At the latest follow up, the mean OKS was 38, KSS satisfaction score was 31, KSS expectation score was 11, KSS function score was 70 and the TAS was 2.9 in the patients with tibia vara. There was no significant difference in the outcome scores between patients with and without tibia vara. There was one bearing dislocation in patient with tibia vara and one bearing dislocation in patient without tibia vara. Oxford mobile bearing medial Unicompartmental Knee Replacement is an effective treatment option for patients with anteromedial osteoarthritis of knee having tibial vara.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 51031

RESULTS OF OXFORD UNICOMPARTMENTAL KNEE REPLACEMENT IN INDIAN PATIENTS WITH ASSOCIATED PATELLOFEMORAL ARTHRITIS

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The Oxford mobile bearing medial Unicompartmental Knee Replacement (OUKR) has shown excellent outcome and survival rates for anteromedial osteoarthritis of the knee. There is a high incidence of patellofemoral osteoarthritis in Indian patients and OUKR is not contraindicated in patients with patellofemoral OA. The aim of this study was to study the results of OUKR in patients with patellofemoral osteoarthritis. In a cohort of 200 OUKR performed from 2008 to 2016, the involvement of patellofemoral joint as per Outerbridge classification: Lateral facet arthritis- Grade 0 in 43%, Grade 1 in 22%, Grade 2 in 13%, Grade 3 in 13% and Grade 4 in 9 %: Medial facet arthritis- Grade 0 in 30%, Grade 1 in 10%, Grade 2 in 33%, Grade 3 in 13% and Grade 4 in 14 % : Trochlea arthritis- Grade 0 in 39%, Grade 1 in 21%, Grade 2 in 18%, Grade 3 in 12% and Grade 4 in 10 %. Anterior knee pain was seen in 85 patients. All patients were analyzed using Oxford Knee Score (OKS), 2011 Knee Society Knee Scoring System (KSS) and the Tegner Activity Level Scale (TAS). The average follow-up of 4 years (range, 1-8 years). At the latest follow up, there was no association of the outcome scores with the presence of patello-femoral osteoarthritis or its severity. There was no significant difference in the outcome scores between patients with and without anterior knee pain. Oxford medial UKR is an effective treatment option for patients with anteromedial osteoarthritis of knee having patellofemoral arthritis.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 51128

UNICOMPARTMENTAL KNEE REPLACEMENT COMBINED WITH ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: MID-TERM RESULTS

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Introduction: A study was conducted to retrospectively evaluate the outcomes of combined medial unicompartmental knee replacement (UKR) and anterior cruciate ligament (ACL) reconstruction. The hypothesis was that this procedure would lead to satisfying results in patients affected by medial osteoarthritis and ACL insufficiency. **Materials and Methods:** Fourteen patients with ACL deficiency and concomitant medial compartment symptomatic osteoarthritis were treated from 2006 to 2010. Twelve of them were followed up for an average time of 7.8 year (range 6-10 years). Assessment included Knee Osteoarthritis Outcome Score (KOOS), Oxford Knee score (OKS), American Knee Society scores (AKSS), WOMAC index of osteoarthritis, Tegner activity level, objective examination including instrumented laxity test with KT-1000 arthrometer and standard X-rays. **Results:** KOOS score, OKS, WOMAC index and the AKSS improved significantly at follow-up ($p < 0.001$). There was no clinical evidence of instability in any of the knees as evaluated with clinical and instrumented laxity testing ($p < 0.001$). No pathologic radiolucent lines were observed around the components. In one patient a total knee prosthesis was implanted due to the progression of signs of osteoarthritis in the lateral compartment 2 years after primary surgery. **Conclusions:** UKR combined with ACL reconstruction is an effective therapeutic option for the treatment of combined medial unicompartmental knee osteoarthritis and ACL deficiency and confirms subjective and objective clinical improvement up to 8 years after surgery.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 52515

FIVE-YEAR EXPERIENCE OF SEMI-ACTIVE ROBOTIC PARTIAL KNEE REPLACEMENT

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Introduction: Unicompartmental Knee Replacement surgery offers many potential advantages but at the cost of reported increased revision rates. The introduction of newer technologies to aid in improved implant placement holds the possibility of both better outcomes in terms of PROMS and lower revision rates. We describe the learning curve and issues that were encountered in the adoption of a new technology along with the results. Methods: NHS hospital, multisurgeon prospectively collected cohort of 138 semi active robot assisted Unicompartmental knee replacements (UKAs) followed up through an arthroplasty review service for a minimum of two years with a maximum of 5.5yrs, compared to a retrospective control group of manually implanted UKAs. Results: The adoption of new technologies carries risks associated with a learning curve, and increased costs these were offset against a significant reduction in all cause and loosening associated revisions. Utilisation of financial modelling methods was also able to validate the relative financial benefits associated with a relatively expensive technological improvement in UKA surgery.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50749

OXFORD UNICOMPARTMENTAL KNEE ARTHROPLASTY: TEN-YEAR RESULTS FROM AN INDEPENDENT CENTRE

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Introduction: The Oxford unicompartmental arthroplasty continues to be the commonest unicompartmental replacement performed in the United Kingdom with over 54,000 joints registered in the National Joint Registry. While designer surgeons have reported large series with 10-year survivorship of over 94%, few long term independent studies have been published. We present from an independent centre, the 10-year survivorship and functional results in a large series of 544 patients with a mean follow-up of 8.42 years (range 5 to 17 years). **Materials and Methods:** A prospective longitudinal case study was designed, recruiting 833 consecutive patients undergoing Oxford unicompartmental arthroplasty from February 1999. Patient demographics, preoperative and postoperative functional scores including Hospital for Special Surgery (HSS) Knee Score, Oxford Knee Score (OKS) and American Knee Society Score (AKSS) was recorded and statistically analysed. **Results:** 558 patients with a minimum 5-year follow-up of whom 215 had a minimum 10-year follow-up were included in the analysis. We report a 10-year survivorship of 89.7%. At the time of last follow-up, there was a significant improvement range of movement (Mean Preop 3.41°-114° to 1.14°-123.45°), HSS knee score (from mean preop 59.06 to 84.83, p value <0.0001), OKS (mean 22.89 to 35.90, p value <0.0001), and AKSS (93.03 to 155.23, p value <0.0001). **Conclusion:** The results indicate excellent results with good survivorship can be achieved in independent centers and supports the continuing use of Oxford unicompartmental arthroplasty where appropriately indicated.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 51352

**LATERAL UNICOMPARTMENTAL KNEE REPLACEMENT USING INLAY
FIXED BEARING ALL-POLYETHYLENE TIBIAL COMPONENT:
SURVIVORSHIP AND MID-TERM OUTCOMES**

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Introduction: Lateral compartmental knee arthrosis is less frequent in the general population than medial compartmental disease. Here we report our average 6-year follow-up experience for 96 knees using cemented fixed bearing all-polyethylene tibial components. Methods: Ninety-six lateral unicompartmental knee arthroplasties were performed in ninety-one patients by a single surgeon. Retrospective chart reviews and radiographic evaluations were performed, and Knee Society functional scores and Post-operative satisfaction forms were determined. Results: The mean follow up time was 6 years (2-11 years). The mean Knee Society function scores improved from 67 points pre-operatively to 82 points. Preoperative alignment averaged 6° (+4.45) of valgus, which was corrected to an average of 1° (+2.22) postoperatively. There were 12 revisions and three arthroscopic reoperations. At 9 years the survival rate was 82%. The authors were unable to identify any patient-specific factors (age, gender, BMI and preoperative functional knee score & preop knee axis) that could predict the change in clinical outcome. Conclusion: Lateral unicompartmental knee replacement using cemented All-polyethylene Tibia provided durable and reliable mid to long-term results. This approach is safe and conservative allowing rapid return to normal knee function.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 52319

LEARNING CURVE OF ROBOTIC-ARM ASSISTED TOTAL KNEE ARTHROPLASTY

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Introduction: While robotic-arm assisted total knee arthroplasty (TKA) may offer improvements in precision, concerns over increased operative time remain a barrier for surgeons. This study aims to determine the duration of the learning curve with robotic TKA. Methods: A prospective observational study evaluating the experience of two surgeons was executed. Each surgeon performed a minimum of 20 robotic-arm assisted TKAs (n=45), which were compared to conventional TKAs (n=48). Time points measured throughout robotic and conventional TKAs included (1) tracker placement (robotic only), (2) landmark registration (robotic only), (3) bone preparation and cutting, and (4) ligament balancing and implant trialing. The primary surgical time point for determining the learning period was an aggregate of all time intervals (arthroplasty time). An asymptotic regression was done to determine the duration of the learning period and final steady state arthroplasty time. Results: Based on a steady state arthroplasty time of 26.7 minutes, surgeons achieved 95% of learning after performing 13 robotic TKA cases. After the learning phase (cases 14-25), the mean arthroplasty time was 24.9 minutes, a reduction of 22.8 minutes from the mean during the first three robotic TKA cases. In comparison, the mean arthroplasty time for conventional TKA was 15.1 minutes, a difference of 11.6 minutes from the estimated steady state with robotic TKA. Conclusion: Surgeons can expect to overcome the learning period during the first 10-15 cases using robotic-arm assisted TKA. After the learning phase, there was a marginal increase in surgical time for robotic-arm assisted TKA compared with conventional TKA.

Date: 2018-10-11

Session: Knee Free Papers (HTO and UNI)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50905

PATIENT-REPORTED OUTCOMES CORRELATE WITH FUNCTIONAL SCORES AFTER OPENING WEDGE HIGH TIBIAL OSTEOTOMY

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Purpose: The purpose of the present study was to assess postoperative patient subjective satisfaction and to analyze associated peri-operative factors following biplanar medial open wedge high tibial osteotomy (OWHTO). **Methods:** The study cohort consisted of 88 patients with a minimum of two years of follow-up. Patient satisfaction was evaluated with a questionnaire that assessed (1) overall satisfaction, (2) pain relief, (3) daily living functions, and (4) cosmesis. Patients were categorized into two groups (satisfied or unsatisfied) based on overall satisfaction questionnaire. Pre- and post-operative objective clinical statuses were assessed with a knee scoring system based on the American Knee Society (AKS), the Western Ontario McMaster University Osteoarthritis Index (WOMAC), and ROM. **Results:** Of the 88 patients, 85.2% were graded as satisfied according to the overall satisfaction estimation. The percentage of patients satisfied with pain relief, daily living functions, and cosmesis were 85.2%, 86.4%, and 86.4%, respectively. Multivariable logistic regression analysis demonstrated that pre-operative Hip-Knee-Ankle angle (HKAA) (odds ratio (OR) = 1.812), post-operative AKS knee score (OR = 1.156), and post-operative HKAA (OR = 0.717) were significantly associated with overall satisfaction. Preoperative HKAA (OR = 1.436), post-operative WOMAC activity score (OR = 0.865), and post-operative HKAA (OR = 0.505) were significant predictors for satisfaction with pain reduction, daily living functions, and cosmesis, respectively. **Conclusions:** Biplanar medial OWHTO is an effective treatment for osteoarthritis with varus deformity in terms of subjective satisfactory outcome. Several factors, including pre and post-operative HKAA, post-operative AKS and WOMAC score, were significant predictors for subjective satisfaction.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52719

KEY NOTE LECTURE: FUTURE OF BIOLOGIC JOINT REPLACEMENT

Kevin STONE

, . (UNITED STATES)

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52500

**HUMAN AUTOLOGOUS MICRO-FRAGMENTED ADIPOSE TISSUE
INTRA-ARTICULAR INJECTIONS FOR KNEE OSTEOARTHRITIS**

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¹CLINICA NOSTRA SIGNORA DELLA MERCEDE, Rome (ITALY), ²CLINICA
NOSTRA SIGNORA DELLA MERCEDE, ROME (ITALY)

Goal: evaluate safety and therapeutic use of human autologous micro-fragmented adipose tissue as potential disease modifying treatment option in patients with knee osteoarthritis. Material and Methods: Ten patients with Kellgren-Lawrence grade 1-3 knee osteoarthritis were treated by intraarticular injection and followed-up for 12 months. Human autologous adipose tissue injectable graft was obtained by adipose tissue micro-fragmentation obtained using a minimal manipulation technique in a closed system. Results: patients were clinically assessed pre-operatively and followed at 3, 6 and 12 months follow-ups using WOMAC and VAS scores. Both WOMAC and VAS scores showed significant improvements. No serious adverse event has been reported. Conclusions: Human autologous micro-fragmented adipose tissue intra-articular injections were safe, effective, well tolerated and rapidly improved pain and articular function of the knee joint, rendering them a promising novel treatment for knee osteoarthritis looking forward to prospective randomised controlled clinical trials.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52432

MID-TERM OUTCOMES OF CARTILAGE REPAIR USING THE LIPO-AMIC TECHNIQUE

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Goal: Investigate the mid-term clinical outcomes of cartilage repair using the one-stage technique of adipose tissue transfer derived stem cells in association with a collagen based scaffold (LIPO- AMIC) for treatment of full thickness cartilage injuries in the knee. Methods and Materials: Eighteen patients with grade III and IV cartilage injury underwent LIPO-AMIC treatment (mean age 43,9 years). Patients were followed prospectively using patient reported scoring instrument consisting of Lysholm score, the Knee Injury and Osteoarthritis Outcome Score (KOOS) and visual analogue scale (VAS) and MRI imaging. We performed comparative analysis of preoperative and postoperative scores and MRI imaging. Results: Patients were followed at 6, 12, 24 months with final follow-up at three years. Patients showed relevant, immediate and durable improvement of scores already from initial follow-up. At final follow-up all scores were significantly increased ($p < 0.001$). MRI examination showed early subchondral lamina regrowth and progressive maturation of the repair tissue and moderate to complete filling of the defects. Conclusion: The repair of full-thickness cartilage injuries in the knee using the LIPO-AMIC technique (Chondro-Gide collagen membrane + ADSCs) provides good to excellent clinical improvement and MRI defect filling at mid-term follow up at three years, with results improved in respect to standard AMIC technique and comparable to matrix assisted chondrocyte implantation, at significantly reduced costs. The literature has clearly stated that adipose tissue can represent the ideal source of mesenchymal stem cells since the easiness of the lipoaspirate withdrawal, the mini-invasivity of the surgical procedure, the definite chondrogenic capacity and the abundant quantities of tissue and cells that can be harvested.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51393

SPONTANEOUS OSTEONECROSIS OF KNEE TREATED WITH PERCUTANEOUS CORE DECOMPRESSION: A RETROSPECTIVE STUDY

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Introduction: Spontaneous osteonecrosis of knee (SPONK) is one of the leading cause for sudden onset knee pain in middle age and elderly persons. We retrospectively analyzed 28 cases of SPONK treated at our institute with percutaneous core decompression. Materials and method: The average age of patient was 60.3 years with 17 female and 11 male patients. Patient presented with sudden onset knee pain unable to weight bear on the affected limb. They were evaluated clinically, hematologically, X-ray and MRI to diagnose the cause of pain which may be due to subchondral fracture, meniscal tear, pseudogout, SPONK or septic arthritis. Patients diagnosed as SPONK were treated with percutaneous core decompression. Post operatively patients were kept non weight bearing for 3 weeks followed by protective weight bearing for another 3 weeks. Average follow-up of these patients was 3 years (1-4.5 years). Results: SPONK was seen at medial femoral condyle(15), lateral femoral condyle(8) and tibial condyle(3). Immediate pain relief was observed. Patients with an average preoperative VAS score of 8.2, post-operatively had an average VAS score of 2.3 on day 1. None of the patients developed arthritis during follow-up. It was also observed that 85% of patients had pre-existing medical comorbidities like ischemic heart disease, stroke, diabetes, metabolic disorders. Conclusion: Percutaneous core decompression gives dramatic pain relief in patients with SPONK and can be used as a first line treatment for wheel-chair bound patients with severe pain.

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Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

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Abstract no.: 52323

LONG-TERM SAFETY AND EFFECTIVENESS OF COBLATION (RADIO FREQUENCY PLASMA) FOR KNEE CHONDROPLASTY

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The impact of Coblation \diamond radiofrequency (RF)-based chondroplasty compared to mechanical chondroplasty (MC) on magnetic resonance (MR) imaging over time has not been evaluated. A prospective, randomized clinical trial was conducted in 57 subjects requiring arthroscopic treatment of a single medial femoral chondral lesion (Grade 3A) plus partial medial meniscectomy procedure. Subjects were randomized to undergo RF-based chondroplasty (28 patients) or MC (29 patients). There were no device-related adverse events and no adverse MR findings in either group. At Day 10, the results of the imaging analysis showed no significant differences in the Percent Lesion Fill (PLF) between the treatment groups. The overall differences in change of PLF at any visit were not significant ($P > 0.05$) between the treatment groups. The mean KOOS scores in both treatment groups improved from the pre-operative status to each study visit. This improvement in KOOS scores was greater in subjects randomized to RF-based debridement for pain only at Weeks 12 and 24. There was no evidence of significant difference in overall KOOS scores between the groups at any visit. Although not significant ($P = 0.07$), there was a trend of improvement in the KOOS Sports/Recreation subscale with an increase in PLF between the postoperative baseline and Week 52 visits. The sample size for comparisons was small, not allowing for correlations between the imaging and clinical data. The treatment effectiveness comparison is inconclusive because the study was underpowered. The Coblation \diamond technique is based on RF-generated plasma and therefore the clinical data presented here cannot be translated to other bipolar RF technologies.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

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Room: Room 520a+b

Abstract no.: 50687

CLINICAL AND RADIOLOGICAL RESULTS OF MANAGEMENT OF MULTI-LOCULAR CARTILAGE LESIONS OF THE PATELLOFEMORAL JOINT BY MATRIX AUTOLOGOUS CHONDROCYTE TRANSPLANTATION

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Methods: Retrospectively, data were collected from 15 patients with multiple cartilage lesions in patellofemoral joint (30 lesions, not kissing lesions), treated between 01/2009 and 03/2014 by MACT. Lesion size, BMI, nicotine abuse were determined. The follow-up was made clinically by Tegner, ICRS, KOOS scores and radiologically by MOCART score on MRI. Statistical evaluation with SPSS 23. Significance level at $p < 0.05$. Results: 15 patients were examined, mean age 32.6 years $\pm 13a$. The mean lesion size was 6,6 cm² $\pm 2.4a$. BMI was 24.9, 5 patients were smokers. 11 patients (73,3%) achieved group A (normal) and 4 patients (26,6%) B (almost normal) in the objective outcome of the clinical examination. The Tegner score improved from 3.3 ± 1.6 preoperative to 4.93 ± 1.4 postoperative. The subjective ICRS score was 79.8% $\pm 12.1\%$, KOOS was 70,78 ± 10.6 . Subjective assessment showed 6 patients (40%) performed all activities without any restriction, 7 patients (46,6%) performed most activities with little limitation and 2 patients (13,3%) have restrictions in many activities. In MRI, mean MOCART score was 70,6. A transplant failure was not seen in any of our patients. No correlation between MOCART score and the subjective or the objective scores could be found. A negative correlation was found between BMI and MOCART Score ($r = -0.5$). A negative influence of nicotine abuse could not be observed. Increased BMI seems to negatively affect the outcome of the MOCART score. Conclusion: The use of biological repair methods in the treatment of cartilage lesions is an efficient way that has superior results over other treatment methods.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52610

CLINICAL RESULTS OF ARTHROSCOPIC TREATMENT FOR BAKER'S CYST: TWO YEARS FOLLOW-UP

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Background: Popliteal cysts (Baker's cysts) are described by the enlargement of the gastrocnemius-semimembranosus bursa around the knee. One of the pathogenesis is valvular opening between knee joint and the bursa. Now a days, the arthroscopic management of popliteal cysts was introduced and this treatment has the merit of simultaneously correcting both the valvular opening and the associated intra-articular pathology responsible for the persistence of the cyst. Object: The purpose of this study was to determine the efficacy of arthroscopic management in patients with symptomatic popliteal cysts. Methods: Retrospective analysis of clinical result for patients presenting with symptomatic popliteal cyst from January 2012 to December 2014 was done. Twenty five cases of symptomatic popliteal cyst not responding to conservative treatment and with Rauschnig and Lindgren Grade 2 or 3. All patients underwent arthroscopic decompression using a posteromedial portal. The functional outcome was evaluated by use of the Rauschnig and Lindgren knee score. In Last follow-up, it was confirmed the recurrence of the Baker's cyst by ultrasonogram. Result: All patients were followed for 24 months. Among the study group, twenty four patients achieved Grade 0 status while one patient had a failure of treatment with no change in the clinical grading. Conclusion: Arthroscopic management showed significant clinical improvement in patients with symptomatic popliteal cysts. We believed that arthroscopic management can be a effective and safe treatment option for symptomatic popliteal cysts.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52327

PREDISPOSED OSTEOARTHRITIS AFFECTING FUNCTIONAL OUTCOMES OF ARTHROSCOPIC POPLITEAL CYST EXCISION

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Popliteal cyst was believed to be a 1-way valve bridging cyst connecting to knee joint. It was usually accompanied with intra-articular pathologies. Arthroscopic popliteal cyst excision had demonstrated low recurrent rate and had advantages of dealing with intra-articular pathology meanwhile. However, there was few studies mentioning if intra-articular pathology will influence functional outcomes after arthroscopic excision. We hypothesized that predisposing knee osteoarthritis would influence postoperative functional outcomes. Patients with a popliteal cyst and had received arthroscopic excision from 2009/12 to 2015/12 were enrolled into this study (total 23 patients). Preoperative and postoperative X-rays in 2 years were reviewed, and Kellgren-Laurence grade was applied to evaluate the extent of knee osteoarthritis. Cincinnati rating system was used to evaluate 2-year postoperative functional outcome collected by telephone. Besides, VAS score in 2 years and usage of post-operative hyaluronic acid or platelet-rich plasma were also recorded. According to preoperative radiographic films, patients were divided into 2 groups: non-osteoarthritis (grade 0 and grade I) versus osteoarthritis (> grade I). There was no statistical difference in demographic data between these 2 groups. Comparing intra-articular pathologies between these 2 groups, group of knee osteoarthritis showed more likely accompanied with loose bodies. For comparison of functional outcomes, group of osteoarthritis demonstrated significantly worse total scores of Cincinnati rating systems and postoperative VAS score in 2 years than non-osteoarthritis. From this study, surgical excision for patients with a popliteal cyst accompanying with preoperative knee osteoarthritis should be more conservative and cautious due to less postoperative improvement and satisfactory.

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Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51766

COMPARISON OF CLINICAL OUTCOMES AND SECOND-LOOK ARTHROSCOPIC FINDINGS AFTER ALL-INSIDE SUTURE REPAIR VERSUS FIXATIVE DEVICES FOR MENISCAL TEAR

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Purpose: To compare the healing rate of meniscus and clinical outcomes after all-inside meniscal repair between sutures and FasT-Fix devices. **Materials and methods:** Among patients undergoing ACL reconstruction, 59 patients accompanying a concomitant tear of the posterior horn of the medial or lateral meniscus were enrolled in this study. Among 59 enrolled patients, all-inside meniscus repair underwent with sutures in 27 patients, and the FasT-Fix device in 32 patients. Meniscal healing after arthroscopic repair evaluated by second-look arthroscopy, and classified into 3 groups (complete healing, incomplete healing, failed healing). Postoperative outcomes were measured using IKDC subjective score and Lysholm knee score. **Results:** 22 cases (81.5%) were completely healed, 4 cases (14.8%) were incompletely healed, and 1 case (3.7%) was not healed in the suture group. And 18 cases (56.2%) were completely healed, 8 cases (25.0%) were incompletely healed, and 6 cases (18.8%) were failed to heal in the FasT-Fix group. The suture group produced statistically better meniscal healing rate than the Fast-Fix group ($p=0.028$). Between 2 groups at the final follow-up, there was no significant difference in the mean IKDC subjective score and mean Lysholm knee score between groups. Complications due to suture material or FasT-Fix device were not observed during second-look arthroscopy. **Conclusions:** There was no statistically significant difference in clinical outcomes between the two groups. But in the second look arthroscopic view, there was a statistically significant better meniscal healing rate in the suture group than the FasT-Fix group.

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Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51594

MENISCUS ALLOGRAFT SURVIVAL IN ADOLESCENTS: LONG-TERM OUTCOMES

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Purpose: To demonstrate long-term effectiveness of meniscus allograft transplantation (MAT) performed by a single surgeon using a three-tunnel technique in adolescent patients with missing or severely damaged menisci compared to older age groups measured by Patient Reported Outcome Measures. Methods: Longitudinal IRB approval study evaluating subjective and clinical data pre- and postoperatively from 305 patients in three age groups (21 and under (n=12 patients); 21-50 (n=204); over 50 (n=89) with MRI review of patients under 21. Median IKDC, WOMAC, and Tegner values compared using Wilcoxon signed rank correlation test and Kaplan-Meier Survival. Graft failure defined as surgical removal of meniscus allograft or increased WOMAC pain reported by the patient at latest follow up. Significance was set at $\alpha = 0.05$. Results: Twelve adolescent patients underwent MAT; Mean age at surgery 16.0 ± 1.7 years (13.0-19.0 years); 6 (60%) were female. Mean follow-up 10.0 ± 5.3 years (2-19 years); success rate 92% with significant improvement in median IKDC scores (49.7 to 74.1, $p = 0.000$); No significant difference in WOMAC (5.9 to 1.4 $p=0.077$) or Tegner (3.3 to 5.7, $p = 0.105$). Significant difference ($p=0.020$) in mean survival based upon age groups; under 21, 18.3 ± 1.6 years; 21-50, 11.7 ± 0.9 years; over 50, 9.2 ± 0.7 years. Conclusion: This study demonstrates long-term survival of 18 years, effectiveness and improved function in a young patient population who underwent MAT using the three tunnel technique following loss of meniscus tissue after knee injury. MRI data showed no clinically significant development of arthritis, implying joint preservation was maintained.

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Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51199

CLINICAL OUTCOME AFTER ARTHROSCOPIC IMPLANTATION OF MENISCAL SCAFFOLD IN PATIENTS WITH POST-MENISCECTOMY SYNDROME

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Arthroscopic partial meniscectomy is the most commonly used treatment option for meniscus tear. It leads to number of patients suffering knee pain due to the effect of a lost meniscus. Many studies have shown Implantation of the meniscal scaffold in patients who have pain after partial meniscectomy provides pain relief and better function in short term and medium term. Our study was done in Burjeel hospital, Dubai, includes 12 patients who were operated before with partial meniscectomy including 10 patients with medial meniscus and 2 with lateral meniscus. All patients were diagnosed with post meniscectomy syndrome based on clinical and MRI assessment. All underwent arthroscopic surgery with implantation of actifit meniscus scaffold sutured to remnant of meniscus and capsule with combination of all inside and outside in sutures. Postop rehabilitation protocol followed. Results: the mean follow up was 18 months. Two patient lost to follow up after 6 to 8 months. The longest follow up patient was for 24 months. All the patients were assessed with pain score and knee score. Six patients were assessed with MRI after 6 months to 1 year and there was no case of implant loosening or breakage. All patients improved on pain score and functional level between baseline and 18 months. Discussion: clinical results of this study suggest improvement in pain score and functional score in short term follow up and medium term. Actifit is safe and effective in relieving pain and improving functional outcome in patients with post meniscectomy syndrome.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Cartilage and Meniscus)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 50991

ARTHROSCOPIC INSIDE-OUT PIE-CRUSTING TECHNIQUE IN MEDIAL MENISCUS REPAIR

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Introduction: Meniscal repair may not be easy even when the appropriate position is given to the knee. The current study assessed medial meniscal repair with “inside-out, pie-crusting” technique by evaluating postoperative radiology, clinical outcomes and our own experience. Method: 37 patients (32 male, 5 female) between 2012 and 2016 were included with medial meniscal pathology. All the patients had arthroscopic surgery and MCL was loosened using pie-crusting technique. 26 patients had also ACL reconstructions using hamstring autograft during the same session. They had standard postoperative rehabilitation with an adjustable brace and isometric exercise for 4 weeks. All the patients had their assessments at 1., 2. months and additional Lysholm knee and VAS pain scores at 6th month. Results: Mean age was 31.4 (20-69). Intra-operative video records showed between 2 and 5 mm increase in the joint space. At 6 months, Lysholm score was a mean of 93 (67-100) and VAS was 0.8 on average (0-4). ROM was 0-134 (0 and 120-140) degrees. Majority of the patients return to their activity level, sport activities at 4 months (3-6). There was no documentation of infection and at 6 month and no limitation or restriction of knee movements in any patient. Conclusion: Pie-crusting facilitates meniscus repair by giving better space to the surgeon in the operating field and might decrease the complications such as iatrogenic cartilage damage, improper suturing. We recommend this technique to the surgeons who deal with knee soft tissue problems and face the difficulties in repairing meniscus.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 50910

GRAFT BENDING ANGLE AT THE INTRA-ARTICULAR FEMORAL TUNNEL APERTURE AFTER PCL RECONSTRUCTION: INSIDE-OUT VERSUS OUTSIDE-IN TECHNIQUES

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Introduction: No in vivo 3D-CT studies have compared graft bending angles at the femoral tunnel aperture and femoral tunnel length in patients who underwent PCL reconstruction with outside-in (OI) and inside-out (IO) techniques. This study used in vivo 3D-CT analysis to compare graft bending angles at the femoral tunnel aperture and femoral tunnel lengths after OI and IO femoral drilling techniques in PCL reconstruction. Methods: Postoperative 3D-CT and curved planar reformation were used to assess the graft bending angles and femoral tunnel lengths in the sagittal, axial, and coronal planes in 67 patients who underwent single-bundle PCL reconstruction with the OI (n = 37) and IO (n = 30) techniques. Results: Mean graft bending angles on the sagittal and axial planes were 8.20' (23.5' vs 15.30', P = .011) and 5.3' more acute (49.00' vs 43.70', P = .013), respectively, with the IO compared with the OI technique, but the difference in the coronal plane was not statistically significant. Femoral tunnel length was similar in the 2 groups. Conclusion: The graft bending angles in PCL reconstruction were more acute in the sagittal and axial planes with the IO compared with the OI technique, but there was no difference in the coronal plane. Femoral tunnel lengths did not differ significantly between the two groups. Although further biomechanical studies are needed to evaluate the effect on graft failure of a < 10' difference in graft bending angle, the small magnitude of this difference would likely have little adverse effect on graft survival.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 50598

A QUANTIFIABLE RISK FACTOR FOR ACL INJURY: APPLIED MATHEMATICS TO MODEL THE LATERAL TIBIAL PLATEAU SURFACE GEOMETRY

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Introduction: The ALL (anterolateral ligament) is a restraint to tibial internal rotation while the ACL (anterior cruciate ligament) predominantly controls anterior tibial translation. Our hypothesis was that increased convexity and steepness of the posterior aspect of the lateral plateau would subject knees to higher rotational torques leading to potentially a higher risk of ACL injury. Method: We mathematically modeled the posterior curvature of the lateral tibial plateau in 64 ACL injury patients and 68 matched nested controls. Using sagittal MRI images of the knee, points on the articular cartilage of the posterolateral tibial plateau were selected and modeled with a power function curve-fit ($y=a*x^n$). Groups were compared using a Mann-Whitney test and $\alpha < 0.05$. Results: There was a significant difference in surface geometry between our ACL-injured subjects and matched controls. The equation coefficients were larger in patients with ACL-injuries: coefficient a (ACL-injured=0.9 vs control=0.68, $p < 0.0001$) and coefficient n (ACL-injured=0.34 vs controls=0.30, $p = 0.07$). Coefficient a had a sensitivity 78.9% and specificity 77.5% for ACL injury using a cut off coefficient of $a = 0.78$. Discussion: Patients with ACL-injury had significantly greater posteroinferior slopes. The steeper drop off may play a role in higher rotational torques on the knee that can predispose to ACL injury. Conclusion: Mathematical quantification of the posterolateral slope can be used to identify patients predisposed to ACL injury. We sought to define an objective trigger point for the decision to proceed with additional surgery to optimize rotational stability in high risk patients.

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Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 49695

PATIENT PARTICIPATION DURING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION SURGERY IMPROVES COMPREHENSION AND SATISFACTION

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Introduction: Twenty-five percent of patients are dissatisfied after anterior cruciate ligament reconstruction. This can be attributed to the patient not understanding the procedure well enough. The goal of this study was to assess the comprehension and satisfaction of two patient groups: a group undergoing the standard surgery procedure and a group involved in their surgery. Methods: 62 patients were included prospectively, 31 in each group. The preoperative information, surgical technique and anesthesia method were identical in both groups. The participation group were allowed to watch the arthroscopic portion of their surgery live. Standardized information was given to these patients. Data was collected using self-administered questionnaires on the day before and the day after the procedure to assess comprehension and satisfaction. Results: Comprehension was significantly improved in the participation group, as the Matava score increased by an average of 7.1 points +/- 5.3 versus the standard group, whose score increased by an average of 2.7 points +/- 5.6 (p=0.024). Satisfaction was also better in the participation group: the mean VAS satisfaction was 9.8 +/- 0.6 in the participation group and 8.9 +/- 1.9 in the standard group (p=0.0033). The Net Promoter Score was 96.8% in the participation group and 64.5% in the standard group (p=0.0057). The average EVAN-LR was 89.1 +/- 6.5 in the participation group and 84.6 +/- 9.9 in the standard group (p=0.0416). Conclusion: Actively involving patients in their ACL reconstruction surgery improves their understanding of the overall procedure, as well as their satisfaction with their care.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 52192

THE ROLE OF MRI IMAGING OF THE ANTEROLATERAL LIGAMENT IN THE SETTING OF KNEE INSTABILITY WITH AN ANTERIOR CRUCIATE LIGAMENT INJURY

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Introduction: Various recent investigations have described the functional and structural behavior of the anterolateral ligament (ALL). However, the stabilizing role of the ALL in the setting of a complete anterior cruciate ligament (ACL) tear is usually underdiagnosed. Methods: Six hundred thirty-three MRI examinations on patients' knees that were done between 2014 and 2017, because of indications related to ligament instability, trauma and anterior pain, were obtained. The images were evaluated looking for lesion of the ALL in MRI examinations with diagnose of ACL tear. Results: The ALL was viewed with signal characteristics similar to those of the other ligament structures of the knee, with T2 hyposignal with fat saturation. The main plane in which the ligament was viewed was the coronal plane. Only in 3.5% of the MRI examined the ALL was refer to in the final diagnose, even though it lesion or being torn was present in the majority of ACL tears. Conclusion: The ALL is an important stabilizer of internal rotation at flexion, and is best viewed in sequences in the coronal plane; however, it is usually underdiagnosed in MRI examinations, and anterolateral its identification and reconstruction could be beneficial in high grade pivot shift even after ACL reconstruction or in ACL revision cases, so it's of great importance its reference in MRI examinations.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51316

ALLOGRAFT VERSUS ALLOGRAFT WITH INTERNAL BRACING IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION IN REVISION CASES AFTER ACL RE-RUPTURE

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Introduction: Anterior cruciate ligament (ACL) ruptures are one of the most common sports associated injuries. Increasing numbers of ACL reconstructions result in higher re-tear rates after return-to-sport and in a higher number of revisions. Allograft transplants may be a good alternative in complex revision cases. The use of so called internal-brace augmentation might help graft ingrowth by providing a higher primary stability. The aim of this study was to investigate the outcome of patients with versus without internal-brace augmentation in ACL revision cases. Methods: This is a blinded, randomized controlled pilot study with 30 patients planned. All patients were treated with achilles tendon allografts with bone blocks either with or without internal bracing. Data (clinical outcomes, 6- and 13-month MRI, SF-36, VAS, IKDC, Lysholm Knee questionnaire, Tegner Activity Scale and KOOS) are collected preoperatively as well as 6, 12 weeks, 6 and 13 months after surgery. Results: So far, there are 13 patients included in the study (12 males). Five patients were treated with internal-bracing. The mean age was 30 ± 7 . There were no re-ruptures in either group. The outcome scorings did not differ between the groups. At 6-months follow-up the results of the scores were KOOS 89 ± 9 , IKDC 74 ± 22 and Lysholm 90 ± 13 for the group without bracing versus KOOS 89 ± 3 , IKDC 80 ± 3 and Lysholm 89 ± 5 in the bracing group. Conclusion: First results show satisfactory outcomes in both groups. If internal-bracing could support the allograft healing process and reduce re-ruptures has to be examined in the course of this ongoing study.

Date: 2018-10-11

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Room: Room 520a+b

Abstract no.: 51188

BIOMECHANICAL ANALYSIS OF ANTERIOR CRUCIATE LIGAMENT THROUGH TIBIAL FIXATION CONSIDERING INTERFERENCE SCREW, POST AND METAL INTERFERENCE SCREW AND POST (HYBRID FIXATION) TECHNIQUES

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The tibial pole has been considered a weak link in the immediate post-operative period after graft fixation of the anterior cruciate ligament (ACL). The surgical hardware employed for fixation should keep the system's stiffness avoiding graft dislocation until biological integration occurs. Such scenario is further challenged when the graft utilized also encompasses soft tissues as in 4-strand hamstring tendon. Current studies diverge regarding the potential increase in biomechanical competence due to the distal post fixation technique. Purpose: The aim was to biomechanically evaluate the tibial fixation resistance in tendinous graft using the interference screw, suture over a post, and interference screw along and post (hybrid fixation) techniques. Materials and Methods: 54 porcine tibia with bovine flexor digital tendons were acquired and divided into three groups. The different groups were subjected to fixation techniques similar to those used for ACL reconstruction: 1- interference metal screw fixation, 2- suture over a post and spiked metal washer, and 3- interference screw along and post (hybrid fixation). Biomechanical pullout was conducted for the determination of stiffness and yield load. Results: The hybrid fixation group presented significantly higher stiffness ($59.10 \pm 3.45 \text{ N/mm}$) relative to the other groups ($p < 0.05$) and higher yield load ($581.34 \pm 33.48 \text{ N}$) relative to the interference screw group ($p < 0.05$). Conclusion: The hybrid fixation technique utilized resulted in higher degrees of biomechanical fixation of the flexor digital tendon.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 49753

CAN CONVENTIONAL X-RAY IMAGING PREDICT ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION FAILURE?

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Introduction: Anterior cruciate ligament reconstruction (ACLR) gives very good but not ideal results. Radiological evaluation of tunnel placement is very important and mandatory before any revision. Aim of study was to correlate between radiological parameters and clinical results of ACLR and to compare between conventional X Ray and CT scans as tools of assessment. Our hypothesis was that good X Ray parameters would indicate good clinical results. Methods: We retrospectively evaluated ACLR patients in our institute from January 2012 till December 2015. Conventional plain X Rays and Multi-slice CT were done for evaluation. Patient was considered to have anatomical ACLR if both femoral and tibial tunnels were anatomical. Patients were assessed clinically by Lysholm score, Tegner activity score, Lachman test, and pivot shift test. Results: Our database revealed 200 ACLR during study period. Out of these; 80 were done by interference screws and hamstring tendon graft with more than 2 years follow up. 10 patients refused to participate leaving 70 included in this study. Forty-five patients had anatomical femoral and tibial tunnel placement. Femoral tunnel was high in 16 and tibial tunnel was posterior in 5 and anterior in 4 patients. Good clinical outcome was positively correlated with proper radiological parameters. There was no significant difference between CT and Plain X Rays Measurements. Conclusion: The logical conclusion is that satisfactory clinical outcome correlates with proper radiological measures. Conventional X Rays can help identify ACLR failure and this constitutes a cheaper option than CT and more importantly less radiation exposure.

Date: 2018-10-11

Session: Sports Medicine Free Papers (Ligament I)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 52307

INTERNAL BRACE FOR 111 ACUTE KNEE DISLOCATIONS: BETTER EARLY RECOVERY AND SUSTAINED LONG-TERM RESULTS

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Purpose: The purpose of this study was to describe the longitudinal outcomes of the reconstruction of acute dislocated knees, using internal brace. **Methods:** One hundred eleven patients with a knee dislocation surgically treated using internal brace (LARS synthetic ligament, Surgical Implant and Devices, Arc-sur-Tille, France) were enrolled between 1996 and 2014. Range of motion, Lachman, pivot shift, posterior drawer, step off sign, valgus, varus, KT-1000 arthrometer, Telos technique, IKDC, Lysholm, Tegner, and Meyers scores were obtained every two years up to 10 years. **Results:** Median age was 32.1 years old (IQR 23.2-43.3). Median follow-up time was 6 years. Median questionnaire scores were; Lysholm 79.5 (IQR 65.0-89.0), Tegner 4.0 (IQR 3.7-6.0), Meyers 3.0 (IQR 3.0-4.0), and mean IKDC was 63.8 (SD 18.9). Median flexion and extension of the injured knee was 124° (IQR 115-129.5) and 0° (IQR -5 - 0) respectively. Median KT-1000 differential was 0.7 mm (IQR 0.1-3.1) for ACL and 0.9 mm (IQR 0.2-1.4) for PCL. Mean differential for Telos was 2.5 mm (SD 5.8) for ACL, 4 mm (IQR 2-6.3) for PCL 30°, and 8.2 mm (SD 4.4) for PCL 90° (consistent with PCL laxity). More than 90% of patients had good anterior articular stability and >60% of patients had good posterior articular stability. **Conclusions:** Reconstruction of acute knee dislocations with internal brace resulted in satisfactory outcomes for the ACL. Telos stress radiography showed PCL laxity in more than half of cases despite low laxity results with KT-1000.

Date: 2018-10-11

Session: Spine Free Papers (I)

Time: 08:00 - 10:00

Room: Room 520c

Abstract no.: 52693

**KEY NOTE LECTURE: BIOMECHANICAL MODELLING OF SPINAL CORD
INJURY**

Thomas OXLAND

, . (CANADA)

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51378

PROPHYLACTIC VERTEBRAL AUGMENTATION AFTER INTRA-DISC LEAKAGE DUE TO KYPHOPLASTY FOR THE TREATMENT OF OSTEOPOROTIC COMPRESSION FRACTURE: A RETROSPECTIVE COHORT STUDY

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Symptomatic adjacent vertebral fracture AVF is a common complication after kyphoplasty. And intra-disc leakage is as an important risk factor, but there were no studies reported on prophylactic vertebral augmentation in high-risk patients. The aim of the study is to evaluate the clinical outcome of prophylactic vertebral augmentation in selected patients, and identify the risk factors of early adjacent vertebral fracture (AVF). Eighty-two patients with intra-disc leakage after kyphoplasty were enrolled and divided into two groups based on whether they received prophylactic vertebral augmentation at the superior level. General conditions, operative details, and complications were recorded. The minimum follow-up was 6 months to ensure that any possible early complications were included. In the non-prophylactic group, 9 of 59 (15.3%) patients had an AVF superior to the level of intra-disc leakage, and 8 of 9 (88.9%) occurred within 6 months post-operatively. Overall, 14 (23.7%) patients had a new fracture. In the prophylactic group, no patients had an AVF, but 3 (13.0%) had remote fractures ($p = 0.047$ and 0.284 , respectively). Patients with comorbidities, including diabetes and hypertension, and corticoid use history had a higher risk of fracture (odds ratios: 12.0, 95% confidence interval [CI]: 1.0–143 and 34.3, 95% CI: 3.2–364.5, respectively). Prophylactic vertebral augmentation can prevent AVF and associated second surgery, and it can reduce the overall new fracture rate. Patients with comorbidities and corticoid use have a higher risk of AVF. Therefore, we recommend prophylactic vertebral augmentation for intra-disc cement leakage with those conditions.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51454

PREDICTORS OF MORTALITY IN ELDERLY PATIENTS WITH FRACTURES OF THE ODONTOID PROCESS: CAN WE USE ESTABLISHED HIP FRACTURE SCORING SYSTEMS?

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Fractures of the odontoid process (OP) in the elderly are associated with mortality rates akin to hip fractures. Currently there are no scoring systems specific to these fractures, which may identify higher risk patients. Established hip fracture scoring systems may be beneficial as predictors of mortality in these patients. We conducted a retrospective review of patients presenting with OP fracture at two institutions. Data collected included demographics, medical history, residence, mobility status, admission blood tests, abbreviated mental test score, presence of other injuries and neurological deficit. All patients were treated with rigid cervical orthoses. Multivariate analysis was performed to identify predictors of mortality at 30 days and 1 year. Ninety patients (mean age 83) were identified. Mortality was 16.8% at 30 days and 36% at 1 year. Through logistic regression analysis statistically significant independent predictors of 30-day mortality included the presence of neurological deficit ($p=0.0010$), the Nottingham Hip Fracture Score (NHFS) ($p=0.0089$), presence of other injuries ($p=0.0141$) and the presence of other spinal injuries ($p=0.0361$). Independent predictors for 1-year mortality included the presence of other injuries ($p=0.0040$) and the NHFS score ($p=0.0044$). ROC curve analysis demonstrated an optimal cut off value of NHFS of 5 as a predictor of mortality (AUC= 0.694 for 30 days and 0.686 for 1 year mortality). In conclusion, the NHFS may be used to identify high-risk patients with fractures of the OP. This may help to guide multi-disciplinary management and inform patients.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 52317

VERTEBRAL FRACTURE MECHANISMS AND DISC BEHAVIOUR VARY DEPENDING ON DISC DEGENERATION AND BONE QUALITY LOSS

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Objectives: Spine fractures are frequent injuries affecting the entire population. However, spine structure and organization evolve with age, through bone quality loss (BQL) and intervertebral disc degeneration (IDD). The goal of this study is to investigate the effects of these two phenomena on spine failure mechanisms. **Methods:** An existing finite elements model of the T11-L1 segment from a male spine (SM2S model) was used to model intervertebral disc degeneration in compression at 1 m/s. For that purpose, degenerated discs were calibrated using experimental data from literature. The effects of BQL and IDD on fracture and discs behavior were then analyzed with respectively three (good, fair and poor) bone qualities and three (healthy, slightly degenerated and degenerated) disc degeneration levels. Statistical analysis (ANOVA tables and estimated effects) were conducted on these results. **Results:** BQL significantly decreased force-to-failure, failure displacement and failure energy whereas IDD significantly decreased only failure displacement ($p < 0.05$). Failure energy was also reduced with IDD, contrary to force-to-failure. IDD and BQL affected fracture patterns as well with lateral or posterior fracture or a combination of the two. Intra-discal pressure was also significantly reduced by IDD and BQL ($p < 0.05$) whereas annulus' stresses significantly increased with IDD and decreased with BQL ($p < 0.05$). **Conclusion:** Disc degeneration induces a stiffening of the disc and so change vertebra's loading. Given the important effects of BQL and IDD, they should be considered for example during protection device assessment or risks injuries assessment.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51967

OUTCOME OF REPAIR OF SYMPTOMATIC PARS DEFECT BY INTRA-LAMINAR SCREWS AND BONE GRAFT

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Out of wide range of surgical techniques direct repair techniques are emphasized to avoid fusion related complications in pars defects. To assess the clinical, functional and radiological outcome of direct operative repair of pars defects by intra-laminar screws and bone graft, this retrospective study was done in Bangabandhu Sheikh Mujib Medical University and in our private settings, within the period of July 2005 to December 2016. Records of 26 patients (age range, 21-35 years) with symptomatic pars defect, 10 men and 16 women (mean 28 years) who underwent direct pars repair with intralaminar screws and bone graft were reviewed. The surgical time, intra-operative blood loss, post operative hospital stay and time to achieve union was recorded. Self evaluated back pain [using Visual Analogue Score (VAS)] and disability [using Oswestry disability (ODI) questionnaire] was analyzed. Clinical outcome was assessed [using Modified Prolo Scale], Radiological fusion (using Shin criteria), restoration of total lumbar lordosis (TLL) and overall functional outcome [using Odom's Criteria] was calculated. Chi-squared test and paired-t test were used for statistical analysis using SPSS. The VAS, ODI and clinical outcome had significant ($p < 0.05$) improvement as had the radiological fusion and TLL. Overall satisfactory outcome was achieved in 91.67% cases. Despite of no intra-operative or post-operative complications, pseudoarthrosis developed in 02 case which could be managed conservatively. Direct repair of spondylitic defect with intra-laminar screws and bone graft is satisfactory in properly selected cases.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 50648

DYNAMIC C-SPINE X-RAY IN TRAUMA MAY MODIFY THE APPLICATION OF THE AO SUB-AXIAL CERVICAL SPINE INJURY CLASSIFICATION INCREASING SURGICAL INTERVENTION

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Introduction: In the management of a trauma patient with potential c-spine trauma, ATLS guides that c-spine pain requires c-spine CT, with an obviously unstable fracture treated surgically. The AO SLIC score helps to determine if surgery is required. Through a systematic review, we have identified a group of cases where the AO SLIC score may be deficient and the use of dynamic C-Spine X-ray can help identify instability. Methods: Systematic review of the literature to identify cervical spine injuries with low AO SLIC scores and dynamic c-spine X-ray indications. There is one paper by Humphrey et al which describes 4 cases of low scoring SLIC scores suggesting conservative management was satisfactory including 3 from our own series. Results: There were 7 cases identified in total. The mean AO SLIC score pre-dynamic X-ray was 0.28 in contrast to the post-dynamic X-ray mean AO SLIC score of 5.85, with p-value showing statistical significance at 0.0000027. Conclusion: CT can propose instability only by suggesting ligamentous injury, supine imaging eliminates the gravitational loads normally exerted on the c-spine. The Subaxial Injury Classification system (SLIC) can be used to guide management, a score of 4 may be treated either conservatively or surgically. We show 7 cases of assumed cervical stability based on CT who underwent dynamic c-spine x-ray which increased their AO SLICS score above the surgical threshold. We suggest a modification to the AO SLIC algorithm and that a patient who scores 4 or less undergo dynamic c-spine X-ray to assess stability.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51287

MORE THAN ONE SPINE PATHOLOGY: WHICH ONE IS THE SYMPTOM GENERATOR?

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Background: Spine disorder is a common reason for patients' morbidity, sometimes there are more than one pathology co-occurring at the same time but independently leading to patient complain. Misdiagnosis of a second pathology may put the patient in a miserable life and the physician in a blameful situation therefore we try to analyze the prospects of this double pathology problem. Method: All patients with spine pathology we reviewed to analyse the multiplicity of pathology in one spine. Results: We discover than some patients having more than one pathology in the same spine, and it was not easy to tell which one should be considered first. Like having tumour and disc, or osteoporosis and spinal stenosis, or multiple sites for one pathology like degenerative changes. Conclusion: We advise through search for the whole spine, and spine is one bone, proper history and physical examination followed by imaging and lab. test is mandatory.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51774

DIFFUSE TENSOR IMAGING VERSUS CONVENTIONAL MRI IN EVALUATION OF CORD INTEGRITY IN ACUTE SPINAL CORD INJURY

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Background: Spinal cord injury is a “life threatening event” and its accurate diagnosis forms the basis of clinical treatment and research. Conventional MRI is commonly used, however it does not provide information on micro structural integrity of any residual fiber tract. The objective of present study is to evaluate the utility of diffusion tensor magnetic resonance (DT MR) imaging for evaluation of cord integrity in patient of acute spinal trauma. Material & Method: This prospective study include 43 patient of acute traumatic spinal cord injury (SCI). 42 aged matched neurologically intact control were also included. The present study was done using 1.5 Tesla – MRI Magnetom Avanto. DTI is performed in sagittal plane using multi shot Echo Planar Imaging. Data processing was done using Automated neuro-3D software. Data was analyzed and compared with conventional T1 - T2 MR images. Results: 5 images showing complete transactions in conventional MR sequences on further evaluation with DTI displayed residual tract fiber. 4 images showing partial cord transaction in conventional MRI, displayed complete transaction in DTI. Apart from qualitative evaluation of cord integrity, DTI is also a semi quantitative tool for evaluation of residual cord fibers. Conclusion: DTI seems to be a sensitive method to depict minor structural change in cord or to detect residual fiber that are not seen on conventional MRI, as many patient finding on conventional MRI did not match with DTI.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 50748

SEQUENTIAL ELECTRODIAGNOSTIC STUDIES IN PATIENTS WITH ACUTE TRAUMATIC SPINAL CORD INJURY: CORRELATION WITH NEUROLOGICAL DAMAGE AND RECOVERY

Roop SINGH

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Introduction: Investigations providing information of neurological damage and its recovery help in predicting ultimate prognosis. Present study aimed at evaluating sequential electrophysiological findings and their correlation with neurological damage and recovery in traumatic SCI. Methods: Thirty-five patients with mean age of 31.34 ± 10.63 years were prospectively evaluated with electrodiagnostic studies of lower limbs. Nerve conduction studies of tibial, peroneal and sural nerve; and electromyography of iliopsoas, vastus medialis, tibialis anterior, gastrocnemius and EHL muscle were performed; and compared sequentially and with normative values at presentation, 3 & 6 months. Results: Means of latency, conduction velocity and amplitude were significantly ($p < 0.001$) decreased compared to normative values initially and on follow-ups in all three nerves. Statistically significant correlation was found of ASIA score with mean conduction velocity and mean amplitude (correlation coefficient ranging from 0.422 to 0.732); and mean recruitment of motor unit potential (MUP) and peak to peak amplitude (correlation coefficient ranging from 0.464 to 0.768 for MUP; 0.422 to 0.805 for peak to peak amplitude) initially and at subsequent follow ups. Statistically significant Kappa agreement between neurological recovery according to ASIA score and NCV finding was found with right tibial nerve ($k=0.324$); and EMG finding (recruitment of MUP) with bilateral tibialis anterior muscles ($k=0.400$) and left EHL ($k=0.407$) only. Conclusion: Serial neurologic examination and electrodiagnosis complement each other in prognosticating neurological recovery after acute traumatic SCI. Research trials (therapeutic interventions and rehabilitation) in the field of acute traumatic SCI can utilize these two to define outcomes with more scientific authenticity.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51011

A PROSPECTIVE STUDY TO EVALUATE AGREEMENT BETWEEN THE ASIA IMPAIRMENT SCALE AND MAGNETIC RESONANCE IMAGING TO PREDICT NEUROLOGICAL RECOVERY IN ACUTE TRAUMATIC SPINAL CORD INJURY

Roop SINGH

PT. B.D. SHARMA PGIMS, ROHTAK, - (INDIA)

Introduction: Standard protocols in evaluation in traumatic spinal cord injury include Magnetic Resonance Imaging (MRI) and neurological assessment by ASIA impairment scale. Aim of the present study was to evaluate whether there is an agreement in these two to predict neurological recovery in acute spinal cord injury (SCI) patients. Methods: Thirty-five patients of SCI with mean age of 31.34 ± 10.63 years were prospectively evaluated with MRI and ASIA scoring at presentation, 3, & 6 months. Statistical analysis of MRI (qualitative & quantitative) findings was done with ASIA scoring to find an agreement. Results: The neurological recovery was highly significant ($p < 0.001$) by Friedman ANOVA test. Initially, maximum subjects (57.1%) were classified into grade C. 20% subjects presented with complete injury (ASIA score A) initially whereas only 5.7% subjects were having no deficit (ASIA score E). At the end of 6 months, maximum subjects had no deficit (51.4%). There was significant improvement on MRI in canal & cord compression, lesion length, hemorrhage, edema, stenosis, soft tissue injury, and posterior ligament complex injury. Statistically significant kappa agreement between neurological recovery diagnosed by ASIA score and MRI findings was found with maximum canal compromise ($k=0.211$) and soft tissue injury ($k=0.318$) only. Conclusions: Many qualitative & quantitative magnetic resonance findings have been used extensively to assess neurological damage and subsequent recovery in the literature. Among these, only two MRI features of maximum canal compromise and soft tissue injury have a strong agreement to predict neurological recovery as assessed by ASIA impairment scale.

Date: 2018-10-11
Session: Spine Free Papers (I)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 52167

RELATIONSHIPS BETWEEN SPECIFIC FUNCTIONAL ABILITIES AND HEALTH-RELATED QUALITY OF LIFE IN CHRONIC SPINAL CORD INJURY

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Objective: The objective of this study is to explore the relationships between specific functional abilities assessed from the 3rd version of the Spinal Cord Injury Measure (SCIM), and health-related quality of life (HRQoL) following a traumatic spinal cord injury (tSCI). Methods: A prospective cohort of 195 patients that had sustained a tSCI from C1 to L1, and consecutively admitted to a single Level 1 SCI-specialized trauma center between April 2010 and September 2016 was studied. Correlation coefficients were calculated between SCIM scores and SF-36v2 summary scores (Physical component score, PCS; Mental component score, MCS). Results: The total SCIM score correlated moderately with the PCS in the entire cohort, correlated strongly with PCS in tetraplegics, did not correlate with PCS in paraplegics, and did not correlate with MCS. Mobility subgroup and individual items scores showed the strongest correlations with the PCS in the entire cohort, followed by self-care and sphincter management. Conclusion: This work is significant being the first to determine which specific functional abilities are mostly related to HRQoL, and highlights the differences between tetraplegic and paraplegic patients. Our findings could help clinicians to guide rehabilitation plan based on importance of specific functional abilities in relationship with the HRQoL.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 49469

THE PRELIMINARY APPLICATION OF FREE-RUN ELECTROMYOGRAPHY IN PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY

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Objective: To investigate the application feasibility and outcomes of free-run electromyography(Free-EMG) in percutaneous endoscopic interlaminar discectomy(PEID) under general anesthesia. Methods: From Mar 2016 to Jun 2017, a total of 86 patients with lumbar disc herniation, including 62 males and 24 females with an average of 41.2 years old, received operation of PEID under general anesthesia. Free-EMG was used for continuous nerve root function monitoring in all the cases. Results: During the operation, the Free-EMG monitoring showed an electromyographic response in the condition of touching, pushing or pull of nerve root, with a positive rate of 100%. The postoperative symptoms of 79 patients were significantly released, 6 cases had symptoms of lower limb burning pain, and the lower limb muscle strength decreased and numbness increased in 1 case. In 1 case with postoperative symptom of lower limb burning pain, there was an obvious intraoperative myoelectric response while it was normal at the end of operation, with a false negative rate of 1.16%. In 2 cases with postoperative symptoms released, there were obvious intraoperative myoelectric responses at the end the operation, with a false positive rate of 2.32%. Conclusion: The Free-EMG monitoring can accurately indicate the nerve root disturbance in the operation of PEID under general anesthesia, thus reducing the probability of nerve injury.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 51745

PERCUTANEOUS KYPHOPLASTY WITH BRACING INSTRUMENT FOR THE TREATMENT OF SPINAL FRACTURES WITH ANKYLOSING SPONDYLITIS

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Purpose: There are few studies regarding the efficacy and safety of percutaneous kyphoplasty (PKP) in treatment of spinal fractures with Ankylosing spondylitis (AS). We retrospectively analyzed clinical and radiological outcomes of our patients to evaluate the feasibility, efficacy and safety of PKP when treating the special type of spinal fracture with AS. **Methods:** A total of 16 patients (18 vertebrae) with AS suffering from painful thoracic or lumbar fractures were performed with PKP from May 2005 to June 2016 and were followed up for more than 1 year. Clinical and radiographic results were carefully analyzed. **Results:** The VAS and ODI score significantly reduced at 3 days and 3 months after the procedure, at last follow-up, compared with preoperative values ($P < 0.05$). The mean postoperative anterior and middle vertebral body height was significantly increased compared with the preoperative heights ($P < 0.05$). There was a statistically significant correction in the kyphotic angle between pre- and postoperative assessment ($P < 0.05$). **Conclusions:** PKP can achieve pain relief, satisfied functional improvement and radiological outcomes in patients with AS.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 51154

IONISING RADIATION EXPOSURE DURING TRANSFORAMINAL LUMBAR INTERBODY FUSION SURGERY: A COMPARISON OF OPEN VERSUS MINIMALLY INVASIVE SURGERY TECHNIQUES

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Introduction: Image intensifier is increasingly used in Trauma & Orthopaedic and Spinal surgical practice. Excessive use of image intensifier cause unnecessary exposure of ionizing radiation to both the patient and the clinician involved in their care. The aim of the study was to evaluate the radiation exposure during Transforaminal Lumbar Interbody Fusion (TLIF) procedure. Methods: We identified all cases of TLIF undertaken at Ipswich Hospital from January 2012 until October 2017. Medical records were reviewed to confirm that they had undergone a TLIF procedure. Data from PACS was retrieved to identify the radiation dosage and screening time for each case. The statistical significance was tested with a t-test using Graphpad software. Results: during the study period 8 consultants undertook 131 TLIF procedures – 87 were performed via a standard Open technique and 44 via a Minimally Invasive Surgical (MIS) technique. One surgeon performed 73 TLIF procedures and a majority of MIS procedures (N=38). The mean dosage of ionizing radiation for Open TLIF was 192.59 (SD = 116.49) cGy.cm² compared to 687.95 (SD = 589.26) cGy.cm² for MIS TLIF. This was statistically significant with a p value < 0.0001. The Image intensifier screening time was 0.3033 (SD = 0.2813) min for Open TLIF compared to 1.5453 (SD = 0.7076) min for MIS TLIF, which was also statistically significant (p < 0.0001). Conclusion: MIS procedures increase the risk of radiation exposure to patients and clinicians. Necessary steps should be undertaken to minimise the risk of exposure to radiation.

Date: 2018-10-11

Session: Spine Free Papers (II)

Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 50095

**WHERE IS THE OPTIMAL POSITION OF THE CBT SCREW END POINT?:
FROM THE ASPECT OF AN ANATOMICAL POSITION-RELATED STUDY
OF CBT SCREW IN LUMBOSACRAL FIXATION**

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Introduction: In terms of the insertion direction of CBT screw, a tip of the screw will go toward the superolateral edge of the vertebral body. There is a risk of neurovascular damage when the tip of screw penetrates a cortex of superolateral endplate. Therefore we investigated not only an anatomical position of the nerve root on the edge of superior endplate of each vertebra (L3,L4,L5,S1) using cadavers but also the anatomical position of vessels using CT images to evaluate the optimal position of the tip of the CBT screw for avoiding neurovascular damage. Methods: 7 human cadavers were used for the study of the position of lumbar plexus. Meanwhile, we targeted 50 patients who undergo spinal surgery at our institute for the study of the position of vessels using CT reconstruction images. Results and discussion: Based on the results on two studies, it was revealed that when the trailing edge of vertebral body set as 0 and the leading edge set as 100 with lateral image. A range of 33.4-87.1, 39.0-85.3, 47.0-78.8, 53.0-68.3 at the upper edge of the L3,L4,L5,S1 vertebra, respectively, was considered to be safety zones. Our careful attention must be paid to the determination of the position and insertion direction of the CBT screw and these results suggest that it is important not to penetrate the cortex of the superolateral edge when the distal end of CBT screw is not located in these areas on the fluoroscopic sagittal image during surgery.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 49790

RISK FACTORS OF REOPERATION AFTER LUMBAR MICROSURGICAL BILATERAL DECOMPRESSION VIA A UNILATERAL APPROACH

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The aim of this study is to elucidate risk factors for reoperation after microsurgical bilateral decompression via a unilateral approach (MBDU) and examined the reoperation rate. Of 250 patients who underwent MBDU for lumbar degenerative lumbar disease between 2006 and 2012 in our hospital, 185 (101 men and 84 women, mean age: 69 years) were followed up for more than 5 years. The mean follow-up period was 6.8 years (5.0-11.2 years). One-level decompression was performed in 138 patients, two levels in 84, and three levels in 1. Cases accompanied by foraminal decompression were excluded. Reoperation cases were classified into three types (canal stenosis of the same lesion, foraminal stenosis at the same level, stenosis at another level). Multivariate analysis was used to investigate risk factors for reoperation. Preoperative factor (lumbar degenerative spondylosis, degenerative lumbar scoliosis, scoliotic disc wedging, DISH) are analyzed as factors. Surgery was performed after MBDU on lumbar spine in 14 cases. One of these case (0.5%) involved canal stenosis of the same lesion, 3 (1.65%) involved foraminal stenosis of the same level, and 10 (5.4%) involved canal stenosis of other lumbar spine levels. The mean duration from primary surgery to reoperation was 4.2 years (0.6-11.0 years). No cases required reoperation for the same lesion during 5 years of follow-up. Scoliotic disc wedging was significantly associated with reoperation (odds ratio 3.8, $p=0.049$). Although cases with scoliotic disc wedging require special attention, MBDU is less invasive for lumbar degenerative disease and has a low risk of reoperation.

Date: 2018-10-11

Session: Spine Free Papers (II)

Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 51302

LEARNING CURVE IN MINIMALLY INVASIVE SURGERY OF ADOLESCENT IDIOPATHIC SCOLIOSIS

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The purpose of this study is to identify the learning curve of minimally invasive surgery in scoliosis. Previously announced minimally invasive surgical techniques of idiopathic scoliosis only present a fragmentary technique less than 10 cases. The evaluation of the learning curve was performed by two surgeons with no experience of minimally invasive surgery in spinal scoliosis. 76 patients underwent surgery for two years from 2015 to 2016 were included. To compare the radiological and clinical results according to the time difference, it was divided into one year after surgery, early period (Group A) and one year later, late period (Group B). Cobb's angle, coronal balance and spinal vertical axis were measured. SRS-22 questionnaires were surveyed to confirm clinical satisfaction. Operation time, blood loss and scar size were evaluated. Group A and B included 31 and 45 cases, respectively. Operative time was 6.5 hours and blood loss was 974ml. Operative time and blood loss continuously decreased as the number of operation increased. In the calculation of learning curve, the operation time decreased to less than 6 hours after 38 cases and the blood loss decreased more than 50% after 18 cases. There was no statistically significant difference between group A and group B ($p > 0.05$), but group B had significantly lower operative time and blood loss ($p = 0.08$, <0.001). The minimally invasive technique for idiopathic scoliosis has a relatively mild learning curve, and it seems to be mature when more than 50 operations are performed.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 50558

A META-ANALYSIS OF ENDOSCOPIC DISCECTOMY VERSUS OPEN DISCECTOMY FOR SYMPTOMATIC LUMBAR DISC HERNIATION

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Purpose: To systematically compare the effectiveness and safety of Endoscopic discectomy (ED) with Open discectomy (OD) for the treatment of symptomatic lumbar disc herniation (LDH). **Methods:** A highly sensitive search strategy was used to identify all published randomized controlled trials up to August 2014. A criteria list taken from Koes et al was used to evaluate the risk of bias of the included studies. The 5 questions that were recommended by the Cochrane Back Review Group were used to evaluate the clinical relevance. Cochrane methodology was used for the results of this meta-analysis. **Results:** Nine relevant RCTs involving 1092 patients were identified. Compared with OD, ED results in slightly better clinical outcomes which were evaluated by the Macnab criteria without clinical significance (ED group: 95.76%; OD group: 80%; OR: 3.72, 95% CI: [0.76, 18.14], P = 0.10), and a significantly greater patient satisfaction rate (ED group: 93.21%; OD group: 86.57%; OR: 2.19; 95% CI: [1.09, 4.40]; P = 0.03), lower intraoperative blood loss volume (WMD: -123.71, 95% CI: [-173.47, -73.95], P < 0.00001), and shorter length of hospital stay (WMD: -144.45, 95% CI: [-239.54, -49.37], P = 0.003). **Conclusions:** From the existing outcomes, ED surgery could be viewed as a sufficient and safe supplementation and alternative to standard open discectomy. The cost-effectiveness analyses still remain unproved from the existing data. More independent high-quality RCTs using sufficiently large sample sizes with cost-effectiveness analyses are needed.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 49912

UNILATERAL PERCUTANEOUS ENDOSCOPIC DEBRIDEMENT AND DRAINAGE FOR LUMBAR INFECTIOUS SPONDYLITIS

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Introduction: The treatment of lumbar infectious spondylitis is controversial. In this study, we attempted to demonstrate that unilateral percutaneous endoscopic debridement with physiologic saline and negative pressure drainage postoperatively may achieve a satisfactory result in lumbar infectious spondylitis. **Methods:** We retrospectively analyzed 17 patients with lumbar infectious spondylitis who underwent percutaneous endoscopic debridement and drainage (PEDD). Each biopsy specimen was submitted without delay after surgery and examined for microorganisms and evaluated histopathologically. Patients were assessed by careful physical examination, MacNab criteria, Oswestry Disability Index (ODI), Visual Analog Scale (VAS), regular serological tests, imaging studies for clinical function, and patient satisfaction. **Results:** Of the 17 patients, 14 (82.4%) had satisfactory relief of their back pain according to MacNab criteria at 1 week after PEDD. Three patients (17.6 %) who had advanced infections with multilevel involvement and paraspinal abscesses underwent anterior debridement and autograft interbody fusion with instrumentation within 2 weeks. However, there were no other severe surgery-related complications. Causative bacteria were identified in most cases and *Staphylococcus aureus* was the most prevalent strain. **Conclusions:** Unilateral PEDD did not disrupt lumbar stability, and avoided the important intraspinal structures such as the dural sac and nerve roots. It not only had a high rate of identification of the causative pathogen, but also provided effective infection control and pain relief. PEDD may be a useful technique for treatment of lumbar infectious spondylodiscitis patients who have no severe deformities and are unable to undergo the conventional anterior surgery due to poor health or advanced age.

Date: 2018-10-11
Session: Spine Free Papers (II)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 51952

FEASIBILITY OF VIRTUAL REALITY COMBINED WITH ISOCENTRIC NAVIGATION IN PERCUTANEOUS ENDOSCOPIC TRANSFORAMINAL DISCECTOMY

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Introduction: Conventional surgical planning and intraoperative procedure of PTED are relied on surgeons' experience, which limits its standardization and popularization. The study was aimed to explore the feasibility of applying VR combined with isocentric navigation in PTED on cadavers. Methods: Firstly, the surgeon manually conducted the above procedures on the left side of every specimen without preoperative simulation and isocentric navigation (Group A). Then the same surgeon conducted the VR simulation for surgical planning of the right side (Group B). Results: At L3/L4 level, the puncture-channel time was 11.36 ± 2.13 minutes in Group A and 11.29 ± 2.23 minutes in Group B ($P=0.938$). Exposure time was 17.21 ± 2.91 seconds in Group A and 14.64 ± 1.60 seconds in Group B ($P=0.025$). At L4/L5 level, the puncture-channel time was 13.86 ± 3.90 minutes in Group A and 11.93 ± 2.95 minutes in Group B ($P=0.039$). Exposure time was 20.64 ± 3.84 seconds in Group A and 16.43 ± 2.47 seconds in Group B ($P<0.01$). There were 7 cases receiving foraminotomy in Group A and 3 cases receiving foraminotomy in Group B ($P=0.236$). At L5/S1 level, the puncture-channel time was 18.21 ± 1.85 minutes in Group A and 15.71 ± 3.20 minutes in Group B ($P=0.028$). Exposure time was 26.07 ± 3.17 seconds in Group A and 22.50 ± 2.68 seconds in Group B ($P=0.011$). There were 14 cases receiving foraminotomy in Group A and 13 cases receiving foraminotomy in Group B ($P=1.00$). Conclusions: VR combined with isocentric navigation is feasible in PTED with merits of precise surgical planning and improved intraoperative procedures, which is potential to be.

Date: 2018-10-11

Session: Spine Free Papers (II)

Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 49875

FACET SAGITTAL ORIENTATION: POSSIBLE ROLE IN THE PATHOLOGY OF DEGENERATIVE LUMBAR SPINAL STENOSIS

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Objective: This study aimed to elucidate the association between facet joint orientation and degenerative lumbar spinal stenosis (DLSS). **Background:** Many studies have demonstrated the relationship between sagittal facet orientation and degenerative lumbar spondylolisthesis. However, the associations between facet orientation and DLSS have rarely been studied. **Methods:** Ninety-one age-matched and sex-matched patients with DLSS (LSS group) and 91 control participants were consecutively enrolled. Their lumbar facet angles and the dural sac cross-sectional area at L2-L3, L3-L4, L4-L5, and L5-S1 were measured using axial magnetic resonance imaging (MRI). The intersection angle of the midsagittal line of the vertebra to the facet line represents the orientation of the facet joint. **Results :** Male patients in the LSS and control groups had significantly smaller facet angles at L2-L3 than female patients. The facet angles on the left side or right side of the LSS group were significantly smaller than the respective ones of the control group. Outcomes of the groups revealed significantly and consistently increasing facet angles from L2-L3 to L5-S1. The dural sac cross-sectional area of the LSS group had significantly smaller measurements values than that of the control group at L2-L3, L3-L4, L4-L5 and L5-S1. **Conclusions:** Sagittalization of lumbar facet joints was considered to be a risk factor for DLSS and may play a role in the pathology of DLSS.

Date: 2018-10-11

Session: Hand Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52694

**KEYNOTE LECTURE: ILIZAROV TREATMENT OF SCAPHOID
NONUNION**

Marko BUMBASIREVIC

, . (SERBIA)

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 51426

SUBSPECIALTY HAND VIRTUAL FRACTURE CLINICS: REPORT AFTER THREE YEARS OF OPERATION

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Introduction: Increasing use of 'virtual' fracture clinics has enabled rapid access to fracture clinic services for those requiring urgent reviews, allowing a bespoke approach to patient care and effective triage for those whose care is best directed toward another facet of the orthopaedic department (eg. Hand therapy, Nurse-led wound review). Aim: To report on our experiences of running a subspecialty specific virtual hand fracture clinic after 3 years of operation and to examine patient satisfaction with this service. Methods: The virtual hand fracture clinic database was examined for the outcomes of patient triage decisions and statistics on initial patient contact compiled. A sample group of patients was invited to provide feedback on their experience and satisfaction with the virtual fracture clinic system. Results: Fewer than 50% of patients referred to the hand trauma services at our centre required first contact in the traditional 'face-to-face' fracture clinic. Direct listing for surgery without prior review was appropriate in 9% of patients. Definitive care by the hand therapy team was appropriate in 11% of patients. Satisfaction rates amongst patients were highest amongst those listed directly for surgery, with the lowest scores for those discharged with advice but no physical follow up. Conclusion: Whilst the introduction of a hand specific virtual fracture clinic has allowed us to improve our triage and management decision times of over 300 new referrals a month, satisfaction rates remain highest amongst those patients receiving face-to-face contact or surgery. We discuss our modifications to the model to address these concerns.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 50867

OSTEOID OSTEOMA IN THE HAND: CASE REPORT AND REVIEW OF LITERATURE

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Background: Osteoid osteoma is a well-known benign tumor of bone. It occurs in children and young adults and is rarely seen above the age of 40. It is uncommon in hand and wrist. If it occurs in hand and wrist, its diagnosis is difficult because of its unusual presentations both clinically and radiologically. Materials and Methods: We encountered 13 patients with osteoid osteoma of hand during the last ten years in orthopedic department of university hospital. Results: The average age was 22.9 years (range, 14 to 33 years). Five lesions were in proximal phalanx, two in middle phalanx, and one in distal phalanx. In the wrist, one lesion was in the capitate, one in the lunate, and one in the hamate, one in the triquetrum and one in the trapezoid. The average time from onset of symptoms to successful treatment was 20 months (range, 4 months to 60 months). 4 of 13 patients had had treatment elsewhere, all of them had unsuccessful operative procedures related to incorrect diagnosis. All patients had a minimum follow-up of 6 months (range, 6 months to 9 years, mean: 4.6 years). The operative treatment were successful in all ten patients without any signs or symptoms of recurrence. Only limitation of proximal interphalangeal joint range of motion was remained in one patient due to 60 months delay in diagnosis and treatment. Conclusion: High index of suspicion.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 52170

RADIAL PLATE FIXATION OF DISTAL RADIUS FRACTURE

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Background: A radial incision with radial plate fixation for distal radius fracture has historically been avoided due to its risk to the superficial branch of the radial nerve (SBRN). With careful technique, it is possible to avoid injury to the SBRN, thereby minimizing the soft tissue injury associated with other approaches. We compare subjective and objective functional outcomes of radial plate fixation surgeries that we performed with those of dorsal and volar plate fixation in current literature. Methods: Patients at a single center who underwent radial plate fixation for an AO type A or AO type B distal radius fracture between December 2006 and December 2014 were enrolled in the study. Post-operative grip strength and three-digit pinch strength were measured systematically in the injured and uninjured wrists. Patients also completed a Quick-Disabilities of the Arm, Shoulder, and Hand questionnaire to assess subjective outcomes. Results: Thirty-six patients met our inclusion criteria and had available medical records. Post-operative grip strength in the injured wrist was significantly lowered- 68% compared to the uninjured wrist. After subgroup analysis of dominant and non-dominant wrist injuries, there was no significant difference in grip strength between injured and uninjured wrists. There was no significant decrease in post-operative three-digit pinch strength in the injured wrist- 89% compared to the uninjured wrist. The mean QuickDASH score for our study participants was 20.9. Conclusions: Radial plate fixation is an effective approach for distal radius fractures. Objective and subjective outcomes are non-inferior to those of a dorsal or volar approach.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 50981

PHYSEAL BAR RESECTION UNDER GUIDANCE WITH A NAVIGATION SYSTEM AND ENDOSCOPY FOR CORRECTION OF DISTAL RADIAL DEFORMITIES AFTER GROWTH PLATE ARREST

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Objective: Growth arrest after trauma may be caused by the formation of a physeal bar across the physeal cartilage. Without treatment, the resulting angular and longitudinal growth disturbance will progress throughout the remainder of a child's growth periods. Langenskiöld introduced physeal bar resection to reestablish growth and to prevent progressive limb shortening and angular deformity. We describe illustrative cases of premature distal radius physeal arrest treated by Langenskiöld's method using a navigation system combined with endoscopy. Methods: During the operation, we used a 3-dimensional imaging system. These scan data were transferred to the CT-based navigation system. Using this navigation system, we were able to identify the location of the physeal bar and the direction of drilling in three dimensions. The drill was passed into the physis along the physeal bar under navigation. Then a 1.9-mm endoscope was introduced into the cavity made by drill to check the accuracy of direction and resection of the physeal bar. This maneuver (drilling under navigation and endoscopy of the canal) was repeated until the physeal bar was completely resected. After resection of the physeal bar, the cavity in the bone was filled with bone wax. After operation, the wrist was immobilized in a cast for two weeks. Results: After operation, the deformities of all cases have been improved. The recurrence of physeal arrest dose not happened. Conclusion: Langenskiöld's method provides excellent treatment, but is very demanding. We consider that the combination of both tools is more suitable than the technically-demanding Langenskiöld's method alone.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 52440

TREATMENT OF SCAPHOID NONUNIONS WITH ILIAC BONE AUTOGRAFT AND HEADLESS COMPRESSION SCREW

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The purpose of this study was to determine the healing rate of scaphoid non-unions treated with autogenous iliac bone graft and headless compression screw. For this retrospective data analysis, we revised the medical reports of patients with scaphoid non-union treated at our institution between 2009 and 2017. We included patients with a confirmed diagnosis of scaphoid non-union (injury 8 months prior to surgical intervention) treated with an iliac bone graft and fixation with a headless compression screw. We determined bony healing with X-rays or computer tomography. We included 24 patients (22 male, 2 female) with a mean age of 30 years (range 15-59). There were 4 proximal pole, 19 waist and one distal pole non-union. Twenty-three patients received a tricortical autologous iliac bone graft. One patient was treated with an autologous iliac crest cancellous bone graft. Headless compression screws were used for fixation in all cases. In 20 cases (83%) the non-union healed after a median time of four months. Only one revision was necessary because of failed union. Our data suggest that treatment of scaphoid non-unions with non-vascularized bone grafts and rigid fixation with headless compression screws leads to satisfying union rate.

Date: 2018-10-11

Session: Hand Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 50592

COMBINED DIRECT REVASCULARISATION AND RADIAL SHORTENING VERSUS RADIAL SHORTENING ALONE IN KIENBOCK'S DISEASE STAGE II AND IIIA WITH NEGATIVE ULNAR VARIANCE

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Direct-revascularization by vascularized-graft (VG) is an accepted treatment for Kienbock's disease without negative ulnar-variance. Indirect-revascularization by radial shortening (RS) is accepted for cases with negative ulnar-variance. We hypothesized that with negative ulnar-variance if we combine both techniques, the chances of successful revascularization and good clinical outcome should be higher than with indirect-revascularization alone. A prospective comparative analysis of two groups: RS (13 wrists) and RS+VG (14 wrists) including pain, grip-strength (GS), range-of-motion (ROM), and quick-DASH score, with a minimum follow-up of 3-years. There was a significant difference in favor of VG in pain on exertion, GS, quick-DASH score, and in favor of RS in operative time. Two cases of RS revascularized, while all cases of VG revascularized. We had 2 superficial infections and one wire-migration. Combining RS with VG gives higher rate of revascularization, better pain control and better functional outcome than RS but at the price of more morbidity.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 52437

EVALUATION OF THE RESULTS OF ULNAR LENGTHENING FOR CORRECTION OF FOREARM DEFORMITIES IN MULTIPLE EXOSTOSIS (DIAPHYSEAL ACLASIS)

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Introduction: Most commonly seen deformities in Bony exostosis include bowing of the radius, shortening of the ulna, ulna drift of carpus, and occasionally dislocation of the radial head. The current study reported on the result of management for type IIb . Patients and Methods: A series of 22 patients with Type IIb Masada deformity were treated by Ilizarov Technique at Bari-Ilizarov Orthopaedic Centre, Dhaka, Bangladesh during the period of January 2000 to January 2016. All cases showed ulnar shortening with distal ulnar exostosis and radial head dislocation Type IIb. Functional assessment was conducted before and after correction. All the cases were operated with the application of Ilizarov frame in the forearm. Ulnar osteotomy was done between the 1st and 2nd ring. For correction of radial bowing, osteotomy was done in the true apex of the deformity for lengthening of ulna. 2 oblique 1.5 olive wires were introduced in cross fashion that were connected with slotted rods and accordingly distraction started after 4 or 5 days depending upon the age of the patient. Results: The range of motion improved: flexion increased from 100° to 135 °, extension reached to 12° while it was 25° preoperatively and supination increased from 35° preoperatively to 55° postoperative, all these were statistically significant. All patients and their parents were fully satisfied at the end of follow up. The mean duration of Ilizarov Fixation was 9.9 weeks. Discussion and Conclusion: Lengthening of Ulna and bowing deformity of radius can fantastically be corrected by proper application of Ilizarov.

Date: 2018-10-11

Session: Hand Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52298

THUMB DISABILITY EXAMINATION (TDX) AS A RELIABLE TOOL FOR BASAL JOINT ARTHRITIS

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Until today the assessment and evaluation of thumb basal joint arthritis is limited. Indication consists of the patients' level of pain which is assessed by questionnaires like the Thumb Disability Examination (TDX), disabilities of the Arm, Shoulder, and Hand (DASH)-score (gold standard), visual analog pain scale with activity (A-VAS), Grip-strength and the Eaton-Littler-score. Our aim is to show the importance and reliability of the TDX score in basal joint arthritis. A multi-center basal joint arthritis database was established to collect prospective data conducted from the Columbia University Medical Center, Vanderbilt hospital and Mayo clinic. For the correlation between the TDX score, A-VAS-, DASH-, Eaton-Littler Score, as well as the Grip strength, the Pearson-test was applied. The registry contains 340 patients in total, at a mean age of 70.41-years (range from 23 to 95 years). In 109-cases (79-patients) the TDX score was assessed of which the Eaton-Littler-score was applied in 57-patients before onset of further treatment. A high correlation between TDX and A-VAS score was identified (Pearson-correlation 0.520, p-value <0.001), as well as the Grip-strength (Pearson-correlation -0.336, p-value 0.004), Eaton-Littler-score (Pearson correlation 0.353, p-value 0.007) and DASH score (Pearson-correlation 0.448, p-value <0.001). In comparison to this the DASH score showed no significant correlation in comparison to A-VAS and Grip-strength. Our results show that the TDX-score correlates to higher Pearson- and p-values than the gold standard questionnaire - DASH score - in Grip-strength, Eaton-Littler-Score and A-VAS-score, concluding, that the TDX-score seems to be more reliable and specific for basal joint arthritis.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 51591

**TRAPEZIECTOMY ASSOCIATED WITH INTERPOSITION AND
SUSPENSION TENDINOPLASTY USING THE HEMI ABDUCTOR
POLLICIS LONGUS TENDON IN OSTEOARTHRITIS OF THE
CARPOMETACARPAL JOINT**

**Yousria AKLOUL, Amel DJERBAL, Samir TEBANI, Nazim SIFI
HOPITAL SALIM ZEMIRLI, ALGER (ALGERIA)**

Introduction: Osteoarthritis of the carpometacarpal joint of the thumb is a common pathology. Several surgical methods exist, including trapeziectomy, arthrodesis, prosthesis. Methods: We report in this study our experience and results with our technique of trapeziectomy associated with interposition and suspension tendinoplasty using the hemi abductor pollicis longus tendon (technique derived of Singfusson and Lundborg) with 24 months average follow-up. Eighty patients (84 thumbs) of 65 years average age underwent this procedure. Results: At 68 months average follow-up, 90 % of the patients were painfree. Average opposition was 9 out of 10 according to Kapandji, the grip strength was equal to 17.5 kg and the key pinch to 4kg. The quick DASH was equal to 20 over 100. Ninety-one percent of the patients were satisfied or very satisfied with the results. Conclusion: Trapeziectomy associated with interposition and suspension tendinoplasty with the hémi abductor pollicis longus tendon gives satisfactory functional results which are maintained with follow-up with high satisfaction rate and low complication rate.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 50837

**A SYSTEMATIC REVIEW AND META-ANALYSIS OF TECHNIQUES
IMPLEMENTED IN THUMB METACARPOPHALANGEAL JOINT
ARTHRODESIS**

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Purpose: To compare operative techniques used to achieve fusion of the thumb MCPJ with regards to functional and radiological outcomes, and patient satisfaction. **Methods:** Systematic review of the current and grey literature between June 2006 and December 2017 including adult patients with MCPJ pathology. Meta-analysis performed using Excel, comparing arthrodesis with K-wires, plates and intramedullary (IM) devices. Functional outcome was post-operative Disability of Arm, Shoulder and Hand (DASH) score and pain assessment with visual analogue score (VAS). Radiological evidence of fusion on x-ray, re-operation rate and patient satisfaction also recorded. **Results:** 86 papers identified in initial search, 10 included in meta-analysis; 9 case-series and 1 case report. 313 thumbs in 298 patients; 105 fused using plates, 190 with wires, 18 with intramedullary devices. Average age 45, follow up 30 months and surgical indication pain and instability. DASH scores significantly higher in IM devices than wires or plates. VAS scores post-operatively significantly lower in plates than wires. Patient satisfaction significantly higher in plates than wires. Radiographic failure significantly higher in plates than wires and IM devices. Re-operation rates significantly higher in plates and wires than IM devices. **Conclusions:** Several methods of fusion of the MCPJ are recognised. Plates associated with less pain and better patient satisfaction; but also increased failure of fusion and re-operation. Counselling of patients and surgical experience influence choice of implant. IM devices less utilised but show promising outcomes with low revision rates.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 51754

CLINICAL AND MRI EVALUATION OF KIENBÖCK'S DISEASE TREATED BY 'CAMEMBERT' RADIAL OSTEOTOMY WITH SEVEN YEARS FOLLOW-UP

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Between 2002 and 2012, fourteen wrists in thirteen patients underwent Camembert osteotomy. Three were lost to follow-up. Eleven wrists on ten patients have been reviewed. The average age of the patients was 40.6 years. In 5 cases, an ulnar shortening osteotomy according to Sennwald was associated. Preoperatively, the flexion/extension arc of the wrist was 95°, the radioulnar inclination 38°, the prognosupination 172°. Grip was 13.8 kgf, EVA pain 8.2, PRWE score 82.3, SANE score 26.6%. Lichtman Stages were from 1 to 3A. MRI confirmed diagnosis for all patients. All osteotomies consolidated in 3 months. The extension (+9°), ulnar deviation (+10°), grip (+15kgf), PRWE (-57) and SANE (+53) scores improved significantly. The pronosupination did not change significantly. The MRI aspect of the lunate improved 10 times out of 11. Clinical results were excellent and good in 8 cases, average in 2 and poor in 1 case. The goal of the osteotomy camembert is to avoid lunate collapse and to maintain at best its anatomy. This series shows good results without worsening the lunate. This osteotomy, unloading specifically the lunate, seems effective to protect it. Most wrists are permanently improved. The radiological aspect improves in most cases, and it is likely that some lunate healed. Camembert osteotomy can be used in combination with Sennwald ulnar shortening osteotomy when the ulnar variance is positive. The results on our 11 oldest cases are encouraging. We propose this procedure for the Lichtman 1-2-3A stages if there are no cartilage or ligament injuries.

Date: 2018-10-11
Session: Hand Free Papers (I)
Time: 08:00 - 10:00
Room: Room 521a+b+c

Abstract no.: 50855

SURGICAL TREATMENT OF FINGER PROXIMAL INTERPHALANGEAL JOINT FRACTURE-DISLOCATION WITH DYNAMIC EXTERNAL FIXATION

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Purpose: Fracture-dislocation of the proximal interphalangeal (PIP) joint is a serious injury that can result in poor outcome if underestimated and inadequately treated. It can be treated with extension-block splinting, dynamic traction or open reduction and internal fixation. However, good results cannot always be expected. We present the outcome of dynamic external fixation (DDA2 external fixator, Medical Engineering System, inc. Tokyo, Japan) treatment for this type of injury. **Methods:** Thirteen consecutive patients with a mean age of 38.2 years (range: 15-80 years) were treated with dynamic external fixators for the PIP joint fracture-dislocation. The average time from injury to surgery was 5.0 days (range: 2-9 days). For the depressed fragments of the base of the middle phalanx, percutaneous transmedullary reduction (Hintringer procedure) was performed adjunctively. **Results:** The mean range of motion of the PIP joint was 87.0°. The average of quick DASH score was 3.0 points. Grip strength was 87.4% of the unaffected hand. The average score of visual analogue pain scale was 13.1mm. **Discussion:** Dynamic external fixator can maintain both of concentrically reduced joint and reduced position of bone fragments by distraction while allowing for early motion. For the depressed fragments of the base of the middle phalanx, percutaneous transmedullary reduction was effective in advance of external fixation. Dynamic external fixation is a simple and effective modality for PIP fracture-dislocation. Combination with percutaneous transmedullary reduction, it can be applied for most of the PIP fracture-dislocation cases.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 52518

**MEASURING SYMPTOM SEVERITY IN CARPAL TUNNEL SYNDROME:
SCORE EQUIVALENCE BETWEEN THE BOSTON SYMPTOM SEVERITY
SCALE AND THE SIX-ITEM CTS SYMPTOMS SCALE**

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In patients with carpal tunnel syndrome (CTS) change in symptom severity is usually the most important treatment outcome and often used as primary end-point in randomized trials. Symptom severity is usually measured with patient-reported outcome measures. Since its introduction in 1993 the 11-item symptom severity scale (also known as the Boston questionnaire) has been the most commonly used patient-reported measure of CTS symptoms severity and has been translated to several languages. However, the methodology with which the Boston symptom severity scale was developed almost 3 decades ago had deficiencies. Recently, the 6-item CTS symptoms scale was developed based on the symptom severity scale using item response theory methodology. The CTS-6 has been increasingly used and has been translated to a number of languages. It is unknown whether the scores of these 2 scales (both scored on 1 to 5 scale) are equivalent to enable comparisons across studies. We compared the 11-item symptom severity score with the CTS-6 score in three cohorts of patients who responded to both scales on the same occasion. Our study included 294 patients in 3 groups: 59 patients completed both scales before carpal tunnel release, 111 patients completed both scales 5 years after treatment (surgery or steroid injection) and 124 patients completed both scales 12 to 14 years after surgery. In all three groups the mean 11-item CTS symptom severity score was higher than the mean CTS-6 score by 0.1. Thus, in pre-post intervention study design the mean change scores for both scales will be equivalent.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 50893

FUNCTIONAL EVALUATION OF EARLY NERVE DECOMPRESSION IN HANSEN'S DISEASE

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Introduction: Neuropathy in Hansen's disease is a significant source of disability in the developing world. Studies related to nerve decompression surgery or oral steroids used for treating such cases are limited. Through this study we aimed at documenting the pathology in the nerves intra-operatively and assess neurological recovery following decompressive surgery. Methods: We enrolled 10 patients of Hansen's disease with evidence of peripheral nerve compression in 16 nerves of fewer than 6 months duration. Patients were evaluated clinically by nerve palpation, multiple sensory modality testing, and voluntary muscle testing. Electrodiagnostic studies and high-resolution ultrasonography were used for aiding in determining sites of nerve decompression. External and internal neurolysis, with transposition of the nerve where ever required, was performed to decompress the involved nerves. Postoperatively a monthly evaluation of change in sensory, motor, vasomotor, neuropathic pain and change in quality of life was done for a minimum period of 6 months. Results: Nerves were found thickened in all cases. 10 of 16 patients had sensory recovery with improvement in two-point discrimination and motor recovery with improved grip strength. All patients reported relief of neuropathic pain. We observed significantly improved quality of life by RAND-36 ($p=0.03$). Conclusion: Hansen's disease leads to significant disability. Early nerve decompression is an effective modality to reverse the nerve damage and improve sensory and motor function.

Date: 2018-10-11

Session: Hand Free Papers (II)

Time: 16:00 - 17:30

Room: Room 521a+b+c

Abstract no.: 50843

**ZANCOLLI LASSO TENDON TRANSFER FOR ULNAR CLAW HAND:
ANALYSIS OF 12 CASES**

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Introduction: Clawing in ulnar nerve palsy is defined as hyperextension at metacarpophalangeal joint and flexion of interphalangeal joint. Clawing of fingers not only weakens the hand but also leads to instability, non-coordination, imbalance and asynergism. So normal functioning of hand is badly affected. Purpose: To evaluate the outcome of 12 claw hands corrected with the Zancolli lasso procedure. Patients and methods: Twelve patients (23 digits) aged 15 to 52 (mean, 32) years with claw hand deformity for a mean of 36.2 months secondary to isolated ulnar nerve palsy underwent the Zancolli lasso procedure, in which the flexor digitorum superficialis (FDS) is inserted to the proximal pulley (A1) looping around it. Deformity, power, movement, and function of the hands were evaluated before and after surgery. Results: Postoperatively, after follow up averaged 18 months, Transfers successfully corrected the claw deformity in 20 of the 23 digits. Two of the three failures occurred in the small finger. One of the three failures had uncorrected preoperative proximal interphalangeal joint flexion contractures. In 10 of the 12 patients with pre- and postoperative grip strength measurements no significant improvement in grip strength was noted. Conclusion: This study supports that Zancolli lasso procedure is simple and safe to perform; it creates a functionally dynamic tenodesis, gives good cosmetic deformity correction with better patient satisfaction in selected cases with least possible complications.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 52479

A NEW FINGER-PRESERVING PROCEDURE AS AN ALTERNATIVE TO AMPUTATION IN RECURRENT SEVERE DUPUYTREN'S CONTRACTURE OF THE SMALL FINGER

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Recurrent severe Dupuytren's contracture of the small finger's proximal interphalangeal (PIP) joint is a difficult problem. Further surgery and joint release carries high risk of neurovascular injuries and residual contracture. Other treatments like PIP arthrodesis or arthroplasty commonly yield poor results. Patients are often offered finger amputation. We have devised a novel surgical procedure consisting of middle phalanx monobloc resection and ligament reconstruction to create a new functional interphalangeal joint. Two patients with severe small-finger PIP joint contracture after multiple treatments requested finger amputation but were offered and accepted this new procedure. Through a dorsal incision the extensor tendon is incised longitudinally exposing the middle phalanx and interphalangeal joints. The collateral ligaments of both IP joints are detached from the middle phalanx. The middle phalanx is dissected from soft tissues (including the flexor digitorum superficialis tendon) and removed. The distal phalanx is retracted proximally and the ends of the collateral ligaments are sutured with non-absorbable sutures with the joint held in congruency. The two patients were evaluated at 12 months and 6 months after surgery, respectively. Both patients regained good finger posture with almost full extension and had normal sensation and no pain. The first patient had 60 degrees active flexion in the newly fashioned joint but the second patient had 15 degrees. Radiographs showed a congruent new IP joint. Both patients were very satisfied with the outcome. This novel finger-preserving procedure with middle phalanx monobloc resection and creation of new IP joint is a favorable alternative to amputation.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 51414

UPPER EXTREMITY FREE FLAP TRANSFERS: AN ANALYSIS OF THE NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM DATABASE

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Introduction: The purpose of this study was to assess the complication rates of upper extremity free tissue transfers. Methods: The National Surgical Quality Improvement Program (NSQIP) database was used to identify patients who underwent upper extremity free flap transfer between 2008 and 2016. A total of 111 patients were selected. The patients had a mean age of 37 years (range, 18 to 82 years), 76.6% men, 78.4% were white, 6.3% were black and 15.3% were others. The types of flaps included muscle or myocutaneous free flaps (45.9%), free fasciocutaneous flap (8.1%), fascial flap (2.7%), free vascularized bone graft with microanastomosis (1.8%), free metatarsal flap (10.8%), other free vascularized bone graft (27.9%), and free osteocutaneous flap (2.7%). Chi-square analysis was used to evaluate differences in demographics. The frequency of complications was reported, and the total reoperation rate and procedures performed, along with readmission number, total readmission percentage, and corresponding diagnoses were identified. Results: The 30-day complications included superficial surgical site infection (2.7%), pneumonia (0.9%), DVT (0.9%), intraoperative transfusions (14.3%), and postoperative transfusions (0.9%). The re-operation rate was 4.5%, and most commonly occurred for incision and drainage (1.8%), secondary closure (0.9%), debridement (0.9%), or other (0.9%). The readmission rate was 3.6% and was for suspected flap failure (0.9%), pleural effusion (0.9%), fever (0.9%), and infected postoperative serosa (0.9%). Conclusion: The 30-day re-operation and readmission for free flap transfers to the upper extremity to was found to be 4.5% and 3.6% respectively, suggesting these procedures can be performed at low rates of complication.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 52186

THE TREATMENT OF DISTAL DIGITAL GLOMUS TUMOR THROUGH MARGIN OF NAIL BED INCISION

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Objective: To discuss the feasibility and clinical effects of the treatment of distal digital glomus tumors through the margin of nail bed incision. Methods: From June 2005 to July 2012, 14 cases of distal digital glomus tumor patients in our hospital underwent excision using the margin of nail bed incision, raising a nail bed or nail pulp flap involved periosteum to gain full access to the subungual or finger pulp region under the microscope. The glomus tumor was completely removed by microsurgical resection and subjected to pathological examination. Results: Postoperative wound smoothly healed and pathology confirmed the diagnosis of glomus tumor in all the patients. All cases were followed up from 12 to 55 months with an average of 26.7 months. By the end of follow-up, all patients had complete postoperative relief of pain, the nails recovered completely with normal shape, and there were no complications and recurrences observed. Conclusion: The microsurgical treatment of distal digit glomus tumors with the margin of nail bed approach is an effective new method. This approach is easier, less traumatic and fewer complications than traditional method. The tumor can be also excised completely, which can decrease the recurrence rate.

Date: 2018-10-11
Session: Hand Free Papers (II)
Time: 16:00 - 17:30
Room: Room 521a+b+c

Abstract no.: 50671

OUTCOMES OF CORONAL SPLIT HAMATE FRACTURES TREATED WITH OPEN REDUCTION AND INTERNAL FIXATION WITH A LOCKING PLATE

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Background: Coronal split hamate fractures are less frequent and often involves subluxation of hamato-metacarpal joint. We would like to present our case series treated with open reduction and internal fixation (ORIF) using Medartis low profile locking plate. Aim: To review clinical and radiological outcomes in patients with displaced coronal split hamate fractures treated with ORIF. Methodology: Prospectively collected data of 13 patients treated with ORIF for coronal split hamate fracture over the last 4 years was analyzed. The primary outcome measure was Quick DASH score and secondary outcome measures include patient satisfaction and complications. Results: All the patients were male with an average age of 29 years. 10/13 patients had ORIF with locking plate to hamate bone, 2/13 patient had locking bridge plating from hamate to base of metacarpal bones and one patient had percutaneous screw fixation of hamate. We excluded the patient with bridging plate fixation and percutaneous fixation from the analysis. Among the 10 patients who had Medartis 1.5 mm low profile locking plate of hamate, 5 patients had trans-metacarpal K-wiring as well to address concomitant base of 5th metacarpal fracture. The follow-up radiographs showed all fractures were healed in 9 weeks' time. The mean postoperative Quick DASH score at the final follow up was 1.6. Every patient was very satisfied with the surgical outcome. There were no complications. Conclusions: This is the one of the largest series reporting coronal split of hamate fractures treating with locking plate enabled to achieve high patient satisfaction and functional outcome.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52475

THE OUTCOME OF SURGICAL TREATMENT OF TARSAL TUNNEL SYNDROME

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Introduction: Tarsal tunnel syndrome is an entrapment neuropathy of the posterior tibial nerve or its branches in the tarsal tunnel. Potential causes of tarsal tunnel syndrome can be defined as intrinsic factors (osteophytes, hypertrophic retinaculum, tendinopathy, lipoma, neuroma, ganglion and others) or extrinsic factors (direct trauma, constrictive foot wear, varus or valgus hindfoot, lower limb oedema, diabetes, post-surgical scarring) or idiopathic. The aim of our study is to evaluate retrospectively the prognostic factors affecting the outcome of surgical treatment of tarsal tunnel syndrome. Namely causality, clinical manifestations and duration of illness. Methods: Surgical decompression was performed on 25 patients. Electromyography was performed in every case. Patients with other comorbidities, such as diabetes, were excluded from this study. VAS scale and modified AOFAS score were used to evaluate the outcome of surgical treatment, with a 12 months follow-up. Results: The results of subjective and objective patient 's assessments were, in a majority of the cases, very good or good. The best results were achieved by patients with a diagnosed cause, positive Tinel's sign, and short period of time between onset of disease till surgery. Conclusion: The etiology of the tarsal tunnel syndrome has influence on the results. Immediate diagnosis and short period between occurrence of symptoms and surgical treatment, as well as positive Tinel's sign improve the outcomes.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52528

TOTAL ANKLE REPLACEMENT: A RETROSPECTIVE REVIEW IN A LOW VOLUME CENTRE

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Introduction: Ankle osteoarthritis is a disabling condition that affects patients' quality of life. Ankle fusion is the gold-standard treatment of end-stage arthritis. Total ankle replacement (TAR) is increasingly being used as an effective alternative. Studies show that preserving ankle range of motion results in a more physiological gait pattern and limits overloading of adjacent joints. As TAR failure rates diminish there will be an increase of demand for the procedure, especially by young and active patients. Survival rates appear to be higher in high-volume centres, although studies have not found differences in functional outcome. Our aim is to demonstrate that low-volume centres can perform TAR with functional results and survival rates comparable with high-volume centres. Methods: Between 2004 and 2016 a total of 39 TAR were performed on 36 patients (3 bilateral), using a cementless mobile bearing implant. Radiological studies were performed. AOFAS ankle and hindfoot functional score was determined and range of motion, implant survival or failure were measured. Results: 32 of the 36 patients attended follow-ups. A total of 35 implants was reviewed. Mean AOFAS score is approximately 75. The mean range of motion was 26,52 degrees. One patient needed revision surgery due to mal-alignment, eight ankles had an additional procedure simultaneously and four ankles had a malleolar fracture (two intra-operatively and two discovered upon follow-up). Conclusions: The results show no significant difference between TAR performed in high-volume centres and a low-volume centre. The success of TAR is dependent on surgical indication and surgeon experience with the implant.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 49861

IMPROVISED EXPLOSIVE DEVICE BOMBING A POLICE BUS: PATTERN OF INJURIES, PATHOPHYSIOLOGY AND EARLY MANAGEMENT

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Objective: To understand the different types of blast injuries, their mechanisms, pathophysiology of wounds and clinical consequences caused by improvised explosive device detonation, and their early management. **Methods:** The retrospective study related to 70 Special Security Unit personnel of police travelling on duty in a bus that was struck with an Improvised Explosive Device on February 13, 2014, at 7:48am. The data of triage, primary survey and resuscitation and secondary survey on arrival at the Accident and Emergency section of Jinnah Postgraduate Medical Centre, Karachi, were noted and later analysed. **Results:** Police commandos aged 20-32 years were brought to hospital within 35-55 minutes of blast by ambulances. Triage at Emergency labelled 11 (15.7%) Black, 15 (21.4%) Red, 19 (27.2%) Yellow and 25 (35.7%) Green. Primary blast waves led to 11 closed blast lung presenting as pneumothorax in 9 (12.8%) patients; 11 (15.7%) chest tube thoracotomies were performed. Primary blast waves also produced ear drum and eyeball perforation. Seven (10%) patients received calcaneal fractures; 2 (2.8%) with bilateral calcaneal fractures. Tertiary blast waves also caused amputations, and lower leg open fractures. Patients who died had received multi-system involvement injuries due to combined primary and secondary blast waves. **Conclusions:** Improvised explosive devices produce a variety of serious and uncommon injuries requiring special care and early multi-disciplinary response. Repeated primary and secondary survey in Accident and Emergency are very important.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51736

SURGICAL TREATMENT FOR MÜLLER-WEISS DISEASE

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Müller-Weiss disease is an uncommon osteonecrosis of the tarsal navicular of unknown etiology. From January 2005 to September 2014, we treated 49 patients suffering from Müller-Weiss disease, using the surgical arthrodesis of the talonavicular joint and naviculocuneiform joint with tricortical autologous iliac crest block fixed by screws and plate. They were 15 males and 34 females with a median age of 52.4 years. According to the Maceira staging system, 6 feet were grade 2, 20 feet were grade 3, 19 feet were grade 4, and 4 feet were grade 5. We reviewed the medical records of the patients and took the radiological preoperative and postoperative evaluation. The preoperative and postoperative clinical functions were evaluated using the American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot Scale. To treat Müller-Weiss disease, we introduced a surgical arthrodesis of the talonavicular joint and naviculocuneiform joint with tricortical autologous iliac crest bone block fixed by screws and plate. The median follow up was 26 months. All the feet fused solidly. The median time for complete fusion was 13 weeks. The median AOFAS ankle-hindfoot score improved from 45 points preoperatively to 86 points at last follow-up. In conclusion, the results of this series demonstrate the arthrodesis of the TNJ and NCJ with tricortical autologous iliac crest graft is a reasonable way for treatment of Müller-Weiss disease. Based on our experience with the patients, we believe that emphasis of the restoration of the length and alignment of the medial column could achieve a good outcome.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51733

PRIMARY ARTHRODESIS COMPARED WITH OPEN REDUCTION AND INTERNAL FIXATION FOR LISFRANC INJURIES WITH THE FIRST TARSOMETATARSAL JOINT DISLOCATION: A MULTICENTRE STUDY

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Introduction: Retrospective analyses of treatment for the first tarsometatarsal joint dislocation with Lisfranc injury. Comparison of open reduction internal fixation (ORIF) and primary arthrodesis was conducted for the injury. Methods: This was a multi-center study in nine institutions of China. 126 Lisfranc injuries with first tarsometatarsal joint dislocation underwent surgical intervention. They were 76 males and 50 females with mean age of 45.5 years. Two groups were divided by ORIF group and primary arthrodesis group. 92 patients were performed by ORIF, while primary arthrodesis group including 34 cases. Outcome measures included radiographs, AOFAS scores, VAS and SF-36 scores. Complications and revision rate were analyzed also. Results: 126 patients were followed up for 29.5 months. At 1.5 years postoperatively, the AOFAS score was 79 and 85 in ORIF group and arthrodesis group. The VAS score was 3.1 separately in two groups. The mean Physical Functioning scores of SF-36 was 80.3 points and 83.5• points. The Bodily Pain score of SF-36 was 76.1 points and 84.6• points. Redislocation of first tarsometatarsal joint were observed in 16 cases among ORIF group. 36 patients in ORIF group had pain in midfoot, eight of them had persistent pain with the development of deformity or osteoarthritis. No redislocation and no hardware failure was identified in arthrodesis group. Conclusion: Primary stable arthrodesis of the first ray gives a better short and medium term outcome than open reduction and internal fixation for Lisfranc injury with the first ray dislocation. Possible complication and revision could be avoided by primary arthrodesis for dislocated first ray injuries.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51377

IS THE FOOT LOADING PATTERN RESTORED AFTER TOTAL KNEE ARTHROPLASTY IN DEFORMED KNEES?: PEDOBAROGRAPHIC ANALYSIS OF 121 VARUS KNEES

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Purpose of the study: To analyse the effectiveness of total knee replacement (TKR) surgery in restoring the loading pattern of lower limb with pedobarography in knees with severe pre-operative varus deformity. Methods: Between December 2015 to December 2016, 91 patients (121 knees) with an average age of 63.4 years (45-84) with an average pre-operative varus of 170.02° (150° – 177°) and an average pre-operative hind foot alignment of 9.91° valgus (3.8° - 16.4°) who underwent TKA were assessed for the loading pattern using pedobarographic analysis with Novel emed – XL platform (St Paul, MN, USA) pre operatively and post operatively at six months. Results: Pedobarography showed significant return to normal loading in 117(96.7%) knees and persistent lateral loading in 4(3.3%) knees post operatively at 6 months compared to the pre-operative lateral loading in 113(93.38%) knees. Peak pressures in pedobarography which were mostly in the lateral areas of the foot preoperatively (M6 - 28.1%, M7 - 10.7%, M8 - 31.4%, M9 - 9.1%, M10 - 1.6%), which significantly changed onto the medial side (M1 - 21.5%, M5 - 10.7%, M8 - 57.02%) after the correction of deformity. The hind foot alignment corrected to normal (3-7 degree valgus) in 94 (77.68%) knees, less than 3 degree in 20 (16.52%) knees and persistent valgus > 7 degree was seen in 7 (5.78%). The 3 cases which had pre-operative hind foot varus deformity remained uncorrected. Conclusion: Pedobarographic analysis shows that successful realignment and normal loading pattern is achieved after TKA in varus knees except in cases of pre-operative hind foot varus.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51293

OSTEOCHONDRAL AUTOGRAFT AND ALLOGRAFT FOR OSTEOCHONDRAL LESIONS OF THE TALUS: RESULTS FROM AN INTERNATIONAL CONSENSUS MEETING

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Introduction: Osteochondral autograft and allograft transplantation were discussed at the first International Consensus Meeting on Cartilage Repair of the Ankle. This study explains the process and delineates the consensus statements derived for the use of osteochondral autograft and allograft for osteochondral lesions of the talus (OLT). Methods: 75 international experts from 25 countries participated in a Delphi method consensus meeting. 12 groups were made with 8 experts, including osteochondral autograft and allograft group. Questions and statements were drafted within the groups and a comprehensive literature review was performed to confirm or dispute the recommendations made. The evidence for each statement was graded. Once the statements achieved majority vote within the working groups, the statements were then reviewed within the 75 member consensus group. A final vote then occurred, and the strength of consensus was characterized as follows: consensus: 51 - 74%; strong consensus: 75 - 99%; unanimous: 100%. Results: 29 statements addressing osteochondral autograft and allograft transplantation for OLT reached consensus. The summary recommendations were: [1] Osteochondral autograft should be considered in primary cystic lesions greater than 1 cm in diameter. [2] The lateral femoral condyle is the preferred osteochondral autograft donor site. [3] It is unnecessary to backfill an osteochondral autograft donor site. [4] The most important prognostic factor after an osteochondral autograft is patient body mass index. Conclusion: This consensus will assist clinicians in the treatment of a cartilage lesion of the talus using osteochondral autograft or allograft transplantation.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51013

NEW OPTION FOR THE TREATMENT FOR AVASCULAR NECROSIS OF THE TALUS

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Introduction: The vascular anatomy of the distal tibia was defined due to the cadaveric study. So we considered the new option of the treatment for avascular necrosis of the talus with vascularized bone graft from the tibial arterial arch. Materials and Methods: We performed 20 cadaveric dissection of the vascular anatomy of the distal tibia. Through the results of the cadaveric study, 23 patients with avascular necrosis of the talus underwent the vascularized bone grafting from distal tibia between 2008 and 2016. They included that 10 men and 13 women with mean age of 53 years (range 24-64). Preservation of the talus was performed for the talus necrosis without ankle osteoarthritis (10 cases). And ankle arthrodesis was performed for the secondary OA due to talus necrosis (13 cases). The radiograph, MRI and the clinical outcomes with AOFAS scale were evaluated. Results: The cadaveric study showed the certain existence of the tibial arterial arch. Vascularized bone was able to be elevated using one of the pedicles. The mean follow-up was 18 months (12-62m). In all cases, bone union was obtained without developing collapse. MRI showed revascularization of the talus. AOFAS scale was improved from mean 39 points preoperatively to 81 points at final follow-up. Discussion: Our treatment was successful achieving revascularization of the talus and preventing further collapse. And it can decrease the potential of nonunion after ankle arthrodesis. The vascularized bone grafting from distal tibia can be the new option of treatment for talus necrosis and the secondary OA.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 50965

SURGERY IN SYMPTOMATIC HALLUX VALGUS: DOES THE SEVERITY OF DEFORMITY AFFECT CLINICAL OUTCOMES?

Gin Way LAW, Jeremy Wei Sern LIM, Kae Sian TAY, Jing Kun LEE, Karen Ting ZHANG, Chusheng SENG, Nicholas Eng Meng YEO, Kevin Oon Thien KOO, Keen Wai CHONG, Inderjeet Rikhraj SINGH
Singapore General Hospital, Singapore (SINGAPORE)

Introduction: Literature is sparse on whether severity of hallux valgus deformity affects outcomes of surgery. We thus aim to evaluate the impact of hallux valgus severity on the clinical outcomes of surgery. Methods: 89 consecutive surgeries performed by a single surgeon for symptomatic hallux valgus between 2007 – 2011 were divided into 3 groups (mild, moderate, severe) based on the severity of pre-operative hallux valgus deformity using hallux valgus and intermetatarsal angles. Outcomes were assessed using Numeric Pain Rating Scale (NPRS), SF-36 Physical and Mental Health (SFPF, SFMH) subscales, and American Orthopaedic Foot and Ankle Society (AOFAS) scores pre-operatively, and at 6 months and 2 years post-operatively. Patient satisfaction was assessed at 6 months and 2 years post-operatively. Results: 12 (13.5%), 57 (64.0%), and 20 (22.5%) patients were in the mild, moderate, and severe groups respectively. There was no difference in pre-operative NPRS, SFPF, SFMH and AOFAS scores between the groups except for AOFAS scores for the second toe which were poorer with increasing hallux valgus deformity. Post-operatively, patient satisfaction was high across all 3 groups (88.9%, 88.2%, 87.5%) with significant improvements across all outcome scores. Slightly lower post-operative SFPF scores were seen in the severe group at both 6 months and 2 years. All other scores including patient satisfaction showed no between-group differences on follow-up. There were no complications apart from one case requiring removal of a prominent Akin's screw. Conclusion: Surgery for symptomatic hallux valgus leads to excellent outcomes and high patient satisfaction regardless of severity of deformity.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 50723

**STAPLE FIXATION FOR MANAGEMENT OF LISFRANC INJURIES:
RESULTS FROM A MAJOR TRAUMA CENTRE**

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Shaik YOUSUFUDDIN, Seyed Ashgar ALI

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There is lack of consensus regarding the fixation method for Lisfranc fracture-dislocations which are serious injuries and can lead to significant morbidity. They can lead to midfoot collapse with progression to degeneration and subsequent poor function. Anatomical reduction is the key to success. Several fixation methods have been used including K wires, screws, screw/plate constructs and tightrope. Secondary operations are necessary for removal of these apart from tightrope. Use of Staples is a unique method of fixation with several advantages as it is extra-articular, does not breach the articular cartilage of midfoot joints and at the same time provides some compression allowing enough stability for healing of the ligaments and does not limit all motion. It does not lead to overloading other midfoot joints as it is not very rigid construct and does not need routine removal. We evaluated the results of using this method in 28 patients with median age of 39yrs (Range 20-63yrs). 8 patients had associated injuries. There were 11 homolateral, 15 isolated and 2 divergent injuries. Follow-up ranged from 6months-6yrs .It included clinical evaluation, pain and AOFAS midfoot scores. There was no loss of reduction and all apart from four were pain free and fully weight bearing with very good scores. In 7 patients staples were found to be broken during follow-up but only two were symptomatic requiring removal. There was one infection and one complex pain syndrome. It is an easy technique with good results and preserves the articular cartilage.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 50686

SUPRAMALLEOLAR OSTEOTOMY FOR ANKLE ARTHRITIS: OUR EXPERIENCE FROM A MAJOR REFERRAL CENTRE

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Supramalleolar osteotomy of ankle is an effective joint preserving technique as an alternative to joint sacrificing techniques (fusion or arthroplasty) in management of non-inflammatory ankle arthritis. Ankle arthroplasty may not be a suitable option in younger age groups and physically active people. Similarly ankle fusion has limitations with collateral detrimental effects on other joints like hip, spine and foot. The restoration of alignment between talus and tibia improves ankle joint biomechanics resulting in better distribution of load. This can result in substantial pain relief and improves functional outcomes. It has been reported to be effective in most cases of early to moderate asymmetric ankle arthritis. We evaluated the results in 35 patients which included 22 males and 13 females with median age of 59 years (range 23-76yrs). Medial opening wedge or lateral closing wedge supramalleolar osteotomy was done for varus arthritis and medial closing wedge osteotomy for valgus arthritis. Outcomes were assessed by clinical examination including AOFAS scores which showed significant improvement. Radiological outcomes were also analysed. Follow-up ranged from 1-8yrs. Mean healing time was 10 weeks. One patient required subsequent fusion and in one the plate was broken. It is a safe and relatively easy procedure and may halt the progression of degeneration. Appropriate patient selection, careful planning and addressing other problems (i.e. instability) at same stage can be the key to success. With well aligned hindfoot better outcomes can be achieved if subsequent arthroplasty or fusion is required.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 50669

PERCUTANEOUS ULTRASOUND-GUIDED ACHILLES SUTURE: AN ECONOMIC TECHNIQUE

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-Introduction: Achilles tendon rupture treatment goes from orthopedic management, to surgical treatment through open or percutaneous suture. Early rehabilitation, return to work and absence of complications are the goal. The aim of this study is to show a better cost-effectiveness using a percutaneous ultrasound-guided suture. Methods: 86 achilles tendon rupture, operated in our hospital between January 2013 and September 2015 (54 open and 32 percutaneous sutures). Data collected: age, gender, theatre occupancy, anaesthesia, hospitalization, low molecular weight heparin (LMWH) treatment, necessity of rehabilitation, complications, time to return to sport activity and to work. Results: Open: 3 women, 50 men, average age 46 years old, theatre occupancy 57,65 minutes (47 spinal, 6 general and 1 regional anaesthesia). Average hospitalization 3,04 days, rehabilitation 46,52 days and LMWH treatment 38,26 days. 19 cutaneous problems, 1 re-rupture, 8 months to return to sports activity of average and 5,6 months to return to work. Percutaneous: 10 women, 22 men, average age 52 years old, theatre occupancy 20,81 minutes (local anaesthesia) no hospitalization, rehabilitation time 14,78 days and LMWH treatment 30,03 days. 8 patients with sural pain, 4,36 months to return to sports activity of average and 3,53 months to return to work. Conclusions: Percutaneous ultrasound-guided repair patients spent a significantly shorter period of hospitalization compared to open repair, with shorter theatre occupancy, lower rate of complications and earlier return to work and sports activity. The cost of treatment of Achilles tendon rupture by ultrasound guided percutaneous suture is one third of the cost by open suture.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 50653

PROSPECTIVE MULTICENTRE COMPARISON OF THE EFFECT OF DEFORMITY AND HINDFOOT ARTHRITIS ON THE OUTCOMES OF ANKLE REPLACEMENT AND FUSION AT MID-TERM IN 1009 CASES

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INTRODUCTION: The purpose of this study was to determine if ankle arthritis complexity as defined by the Canadian Orthopaedic Foot & Ankle Society (COFAS) Ankle Arthritis classification [Krause et al, Foot Ankle Int 2010], affects the outcome of Total Ankle Replacement (TAR) and Ankle Fusion (AF). **METHODS:** Prospective data from a Multicenter Ankle database was used to compare outcomes in a consecutive series of 1009 ankles (418 AF, 591 TAR), minimum 2 year follow-up, grouped by COFAS Type (1- isolated arthritis; 2 - intra-articular deformity; 3 - foot or tibial deformity; 4 - hindfoot arthritis/fusion). A linear mixed-effects regression model was used to compare the Ankle Osteoarthritis Score at Last Follow-up (AOS-LFU) between groups. **RESULTS:** Follow up averaged 6±2.9 years. Age averaged 56.0 (AF) and 64.1 (TAR). Revision rate was 3.8% (AF) and 5.8% (TAR). Types 3 and 4 AF showed worse outcomes (AOS-LFU) compared to Types 1 and 2 AF. Types 3 and 4 TAR had the same outcomes compared to Types 1 and 2 TAR. Types 3 and 4 TAR had better outcomes than type 3 and 4 AF. The outcome was the same for all comparisons among Type 1 and 2 AF and TAR. **CONCLUSIONS:** At mid-term, TAR and AF have similar revision rates and yield similar patient reported outcomes in non-complex ankle arthritis. However, for complex arthritis (Types 3 & 4), TAR leads to significantly better outcomes. TAR may be indicated over AF for hind foot deformity or extensive arthritis.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49942

**EFFECT OF SUSTENTACULUM TALI SCREW PLACEMENT ON
OUTCOMES OF CALCANEAL FRACTURES**

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Introduction: The role of screws inserted around the sustentaculum tali (ST) in patients with calcaneal fractures are not fully understood. Methods: We included 131 cases of calcaneal fractures treated by ORIF. Data including, Sanders class, the AOFAS score, and Bohler's angle, were recorded. The postoperative positions of screws around ST using CT could be evaluated only in 20 patients; therefore, these patients were assessed. The positions of the screws were categorized according to ST insertion as follows: STC (screws were completely inserted into ST), STP (screws were partially inserted into ST), and STN (no screw was inserted into ST). Additionally, the positions of the screws were categorized according to whether they entered the groove for the flexor hallucis longus as follows: GS+ and GS-. Results: Regarding ST insertion, there were eight STC, nine STP, and three STN cases. Regarding screw protrusion, there were 13 GS+ and seven GS- cases. The postoperative correction loss of Bohler's angle was significantly higher in STN cases (0.25) than in STC (0.05) and STP (0.02) cases ($p = 0.01$); however, no significance difference regarding Sanders class was observed ($p = 0.49$). Additionally, no significant difference in the mean AOFAS score was observed between GS+ (96.5) and GS- (93.5) cases ($p = 0.20$). Conclusions: Screws inserted into ST might have an important role with respect to maintaining the anatomical alignment of calcaneus in ORIF. Inadequate screw protrusion around ST is acceptable if it does not pass the groove for the flexor hallucis longus.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49906

EXTENDED DISTAL CHEVRON OSTEOTOMY: STABLE AND ACCURATE CORRECTION OF THE ANGULATION AND ROTATIONAL PROFILE

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Numerous corrective osteotomies have been performed for surgical treatment of hallux valgus. We proposed a new modification of the chevron osteotomy, extended distal chevron osteotomy, as well as more effective and accurate correction of the angulation and rotational profile than conventional osteotomy. Between July 2013 and June 2014, the extended distal chevron osteotomy was performed moderate hallux valgus deformity in 63 feet (Group A). For the extended chevron, the first osteotomy was performed to cut 5-10mm from the head of metatarsal to the proximal upper 1/3 of the neck. The second osteotomy was performed to cut 2.5~3.0cm from the upper 1/3 of the neck toward horizontal plane of the plantar surface with an angle of 45~50 degree. Hallux valgus angle and intermetatarsal angle, were recorded to compare with the values of 37 patients (Group B) who were treated by the traditional DCO technique. Mean patient age was 45.3 years. In group A, mean HVA decreased from 32.3° preoperatively to 8.4°, while the angle of group B decreased from 32.4° to 11.4°. Mean IMA decreased from 15.1° preoperatively to 7.3° in group A, while the IMA decreased from 15.1° to 8.9° in group B. That way we could verify that the extended chevron osteotomy is more effective for stability and correcting of the angulation and rotational profile than traditional DCO. The extended chevron osteotomy achieved greater stability and accurate correction. It was more effective than traditional chevron osteotomy in correction of the angulation and rotational profile.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49846

COMPARISON BETWEEN ABSORBABLE AND NONABSORBABLE SUTURE MATERIAL IN MODIFIED BROSTRÖM OPERATION

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The current clinical standard for the surgical treatment of lateral ankle instability remains the modified Broström procedure. Almost surgeons are using non-absorbable suture material. But this has several complications such as irritation, surface tenderness, etc. So we compare the clinical result between nonabsorbable and absorbable suture material. All patients who underwent the modified Broström operation of the anterior talofibular ligament and/or the calcaneofibular ligament between July 2011 and May 2015 were included. A total of 96 patients were included. Non-absorbable suture patient were 50 and absorbable suture patient were 46. Mean follow-up duration was 2.5 years. Outcomes measures included the Foot and Ankle Disability Index, American Orthopaedic Foot and Ankle Society and Reoperation cases by the recurred lateral ankle instability. In non-absorbable suture group, The mean talar tilt angle in preoperative talar tilt test was 14.4 and in absorbable suture group, 13.7, respectively. The mean talar tilt angle in postoperative talar tilt test was 5.3 and in absorbable suture group, 6.1, respectively. There were no significant differences between suture method with talar tilt angle in varus stress x-ray. No significant difference in FADI (87 vs 91; P = .553), AOFAS (83 vs 87; P = .372) score between non-absorbable suture method group and the absorbable suture method group. Except of 2 patients, they were no clinical symptom. Each one patient in non-absorbable and absorbable suture group underwent revision lateral ligament surgery. As compared with non-absorbable suture in open modified Broström procedure, absorbable suture method produced similarly favorable outcomes.

Date: 2018-10-11

Session: Foot and Ankle Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49812

AUTOLOGOUS MATRIX-INDUCED CHONDROGENESIS IN TREATMENT OF PATIENTS WITH HALLUX RIGIDUS

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Introduction: currently, there is no general approach to the choice of surgical treatment of patients with hallux rigidus. The "gold standard" is considered to be the first metatarsophalangeal joint (1 MTPJ) arthrodesis. However, functionally arthrodesis is inferior to the joint salvage operations due to the absence of motion in 1 MTPJ. In our opinion, the most sparing and promising type of joint salvage operation is the 1 MTPJ chondroplasty, which allows to restore painless motion in the joint without changing the foot anatomy. The aim of the study: to analyze the immediate and medium-term results of the 1 MTPJ chondroplasty and to evaluate the proposed method efficiency. Study materials: the results of the surgical treatment of 25 patients with hallux rigidus using the AMIC technique with two-layered collagen matrix Chondro-Gide were evaluated within 12 months after the operation. Methods of the study: clinical – visual analogue scale for pain (VAS pain), American Orthopedic Foot & Ankle Society (AOFAS) scale; instrumental – feet radiography in straight, lateral and oblique projections; feet MRI. Results: in 24 patients the results of the operation were positive. Average VAS pain score before surgery was 75.5, after surgery – 10.5. Average AOFAS score before operation was 38.4, after operation – 92.7. One patient had the disease recidive, a repeated surgery was performed with a satisfactory result. Conclusion: the 1 MTPJ chondroplasty is a promising method of the joint salvage surgery for hallux rigidus.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 49509

RADIOGRAPHIC ANALYSIS OF SURGICALLY TREATED FLATFOOT DEFORMITY IN CHILDREN WITH CEREBRAL PALSY

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Introduction: Pes planovalgus is the most common foot deformity in children with cerebral palsy (CP). Many of these patients become functionally limited and require surgical intervention. The objectives of this study are to assess radiographs of children with CP who have undergone surgery for planovalgus and to measure if there are radiographic improvements post-operatively. Furthermore, this study aims to determine which of these parameters can most accurately quantify correction post-surgery. Methods: A retrospective review was performed to identify patients aged five to 17 with a diagnosis of CP who underwent lateral calcaneal lengthening osteotomy for planovalgus between 2006 and 2015 at London Health Sciences Center. Previously validated radiographic measurements were applied to pre- and post-operative radiographs. Paired T-test and Wilcoxon signed-rank test were used to compare changes in radiographic measurements from before and after surgery. Results: Seventeen patients met the inclusion criteria. This included 11 patients who underwent bilateral surgery and six with unilateral surgery (28 feet). In comparing pre- and post-operative radiographs, statistically significant changes were seen in five out of the seven measurements. Talonavicular coverage angle was found to have the most significant change post-correction. Conclusions: The previously validated radiographic parameters for foot deformity can be applied to the surgically-treated planovalgus foot in CP patients. Five out of the seven measurements changed significantly with surgical intervention. Talonavicular coverage angle was found to be the most accurate measure for post-surgical correction. This is the first study to apply these parameters to CP patients with surgically treated flatfoot deformity.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 49690

PHILOSOPHY OF ARTHRODIASTASIS IN TREATMENT OF PERTHES' DISEASE

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Background: The aim of this work is to assess the effect of this treatment on the shape of the femoral head, the range of motion, radiological changes of femoral head, occurrence of complication, and prognosis of perthes' disease. Material and methods: From 2007 to 2018, 45 patients (50 hips) Treated with articulated hinged distraction of hip. 25 hips treated by orthofix external fixator and 25 hips treated by ilizarov. Mean age 8 years. Duration of symptoms varied from a period of 6 to 60 months. Radiographs taken during the fragmentation stage of the disease were classified by the lateral pillar method of herring, 20 were class II and 30 were class III. Results: The follow-up period ranged from one to 8 year. An improvement of hip motion 85% of the normal range was restored. There was marked improvement of degree of pain and limp post operatively. The results follow-up, this will make 45 hips (90%) satisfactory results. 10 patients were analyzed at skeletal maturity; Harris hip score were performed for pain, function, daily activities, hip (ROM), limb length discrepancy. Conclusion: Arthrodiastasis of the hip joint either alone or with soft tissue release proved to be a definitely good contribution to the treatment of LCPD. Its advantages: Easy technique, minimal complications, does not disturb anatomy of either femur or acetabulum.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 51383

DEVELOPMENT OF A STANDARDISED CLASSIFICATION SYSTEM FOR THE DIAGNOSIS OF DEVELOPMENTAL DYSPLASIA OF THE HIP

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Dysplasia or dislocation severity is regarded as prognostic in developmental dysplasia of the hip (DDH). However, reporting of severity lacks clarity due to variability in diagnostic method and terminology. The purpose of this study was to examine diagnosis variability in a multi-centre, international prospective observational study of infants with DDH in order to demonstrate the complexity of this issue, and the necessity to develop a standardized diagnostic classification system. A multi-centre, prospective hip dysplasia database was analyzed from 2010-2016. Clinical, ultrasonographic and radiographic parameters were compared to determine diagnosis and classify patients by DDH severity. A standardized diagnostic system was developed hierarchically accounting for clinical and radiologic findings. Of 809 patients, 504 were diagnosed by clinical/ultrasound assessment, 223 by clinical/radiographic assessment, 17 by all three methods, 46 by ultrasound and 19 by radiograph. Dynamic assessment was performed on 716/809 patients. There were 109 discrepant findings between clinical and ultrasound assessment (52 hips dislocated on clinical exam not found on US, 57 hips dislocated on ultrasound not detected clinically), and 11 discrepant findings between clinical and radiographic assessment. There is clear need to develop a standardized diagnostic system in order to capture the DDH severity spectrum. Objective ultrasound and radiographic measures have been used to develop such a system, providing definitions that can be applied consistently. Lack of clarity in diagnostic terminology has prevented cross-study comparison and high-level evidence generation; consequently, implementation of this system will potentially enable such evidence generation and contribute to advancements in DDH diagnosis and management.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 50863

TRIPLE OSTEOTOMY OF THE PELVIS IN CHILDREN UNDER SIX YEARS WITH SINGLE APPROACH: PREVENTION OF RETROVERSION AND ANTERIOR IMPINGEMENT

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Purpose: For children under 6 years old requiring high degree correction for acetabular deficiency, we carried out periacetabular triple osteotomy of pelvis (TOP) avoiding hyper-pressure on epiphysis, anterior overcorrection and retroversion of acetabulum. **Materials and methods:** TOP achieved in 25 patients (2 to 5.5 years old), 27 hips: 23 hips of DDH with important dysplasia (CEA -14° to 15°) and 4 hips of Legg-Calvé-Perthes. Clinical examination and CT scan performed and compared the operated hip (OH) to the non-operated hip (NOH). Radiographic exams evaluated pre and post-op angles at the OH. **Results:** Clinical assessment postoperatively: flexion decreased 14° , extension increased 7° , external rotation increased 5° , internal rotation decreased 5° . Radiographic assessment: Acetabular Sharp angle: (preop: 45.3° , postop: 37.1°), the CEA: (preop: 5.7° , postop: 38.7°) and the sourcil-slope: (preop: 22.6° , postop: 7.3°). CT-2D axial analysis: acetabular anteversion (OH: 1° , NOH: 2°), anterior coverage (OH: 37.5° , NOH: 34.7°), posterior coverage 21° (OH and NOH). CT-3D analysis: anterolateral inclination of the lip (OH: 32.7° , NOH: 52°), posterolateral inclination (OH: 48° , NOH: 66°), anterior acetabular inclination (OH: 5.5° , NOH: 15°). **Discussion:** In children less than 6 years old, TOP performed by moving the acetabulum anteriorly (extension) and mainly laterally (adduction) as roulette wheel, permitted the correction of severe acetabular deficiency, avoiding anterior overcorrection and retroversion of acetabulum, all responsible of early pain and osteoarthritis. **Conclusion:** Age should not be the only criteria to choose between Salter's osteotomy and TOP. Patients less than 6 years with severe acetabular deficiency could benefit from TOP.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 51365

CLINICAL-RADIOLOGICAL CORRELATION AND FUNCTIONAL OUTCOME IN CHILDREN WITH DEVELOPMENTAL DYSPLASIA OF THE HIP

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Background: MRI is a good choice for preoperative planning in DDH because of absence of exposure to ionizing radiation, better visualization of non-ossified structures and the multi-planar capability. There are very few studies that have attempted to quantify femoral and acetabular parameters by MRI and correlate it with clinical and functional outcome following DDH surgeries. Methods: It's a prospective study done on patients of DDH in age group 1-5 years. Pre and post operative MRI were done and the angle of femoral anteversion, acetabular anteversion, acetabular index, anterior and posterior sector angle, labral angle and percentage of femoral head coverage by acetabulum were determined. Above findings were calculated and correlated clinically (Intraop stability assessment) and with functional outcome. Results: Fifteen cases were operated from July 2016 to June 2017. Mean age at presentation was 30.87 ± 8.13 months. Based on intraoperative stability a total of 8 Salter osteotomies and 7 open reductions were done. The mean pre-op acetabular index was found to be 42.80 ± 9.95 degrees and mean post operative acetabular index was found to be 23.09 ± 7.26 degrees. ASA/PSA results show good anterior and posterior coverage of femoral head in post operative cases. Salter osteotomy has better results for anterior coverage than open reduction. After 6 month of follow up, on clinical evaluation we found 12 hips in grade 1 and 3 hips in grade 2 according to McKay's criteria. Conclusion: MRI is a good modality to assess femoral and acetabular parameters in dysplastic hip, but surgical choice depends upon intra-op stability assessment.

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Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 50781

RESEARCH ON THE EVALUATION OF THE OUTCOMES OF PELVIC AND PROXIMAL FEMORAL OSTEOTOMIES FOR TREATMENT OF PERTHES DISEASE USING A 3D MODEL

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Pelvic and femoral osteotomies can be used in the treatment of Legg-Calvé-Perthes disease (LCPD), which were designed to improve the containment of femoral head. However, over containment could lead to femoral acetabular impingement. To evaluate the outcome of the surgeries and provide data for precise operative planning, data from 15 patients with unilateral LCPD treated by pelvic and proximal femoral osteotomies were collected. Three-dimensional mathematic models of bilateral hips were established based on the data of CT scan on which morphological parameters were measured preoperatively and after removal of implantations. Shape difference analysis of asymptomatic hips was adopted to locate the most apparent displacement and the main stream on the surface of proximal femur. There were 10 hips rated as Herring type C, and the rest 5 were type B. As for distance between femoral and acetabular spheres, the measured values of the affected side were longer than the one of asymptomatic side. The difference of coverage area of femoral head surface between affected and asymptomatic side was bigger in preoperative model. Moreover, the difference of femoral head volume between affected and asymptomatic side was more evident in preoperative model. The displacement happened mainly on sites where the stresses are concentrated. Pelvic and femoral osteotomies could restore the concentric structure of the hip joints and improve the superior and superoanterior containment with increased femoral head volume. The short-term effect of the surgeries was satisfactory with Herring Type B and C cases.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

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Room: Room 524a

Abstract no.: 52428

**THE '8 PLATE' IN APPENDICULAR DEFORMITY CORRECTIONS
AROUND THE KNEE IN SKELETALLY IMMATURE PATIENTS**

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Objectives: To Study, analyse and quantify the results of Temporary 8 plate hemiepiphysiodesis in skeletally immature patients with frontal plane Deformities around the Knee. **Materials and Methods:** Between 2012 and 2017, we analysed the results of 23 patients, who underwent surgery for frontal plane deformities around the knee. There were 16 cases of Genu Valgum and 9 cases of Genu Varum. **Inclusion Criteria:** Children at or Below the Skeletal Age of 12 years were included in this study. Patients who had at least 2 years of growth remaining were included in this study. There were 11 males and 12 females with an average age of 7 years and 4 months. The conditions included, Post Rachitic Deformities, Idiopathic Genu Valgum, Post Infective Genu Valgum, Knee Deformities Due to Skeletal Dysplasias and Genu Valgum Secondary to Congenital Tibial Pseudoarthrosis. The average length of stay in the Hospital was 36 hours and the patients were allowed weight bearing in 72 hours. The average Preop Angles Femoro-Tibial Angles ranged from was - 23 (Varus) degrees to + 32 Degrees (Valgus). The Average post Op Angles were 0 Degrees to + 7 Degrees of Valgus. The Average period of correction was 11 months and 17 days. **Conclusion:** The 8 plate is a very effective implant in correcting frontal plane deformities around the knee in Children. It is a reversible procedure and does not cause permanent damage to the growth plate.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 49734

SURGICAL TREATMENT OF PROXIMAL FEMUR FRACTURES IN CHILDREN

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Fractures of the proximal femur in children are relatively rare. The most severe complications occur in the femoral neck fractures: avascular necrosis of the femoral head, varus deformity, the premature closure of growth zones and the formation of a false joint. Materials and methods: In the period 2015-2017 13 children with fractures of the proximal femur asked in Morozov Children's Hospital. Among them we met fractures 31-M I-III types according to AO PCCF. 11 children were operated: osteosynthesis with screws or by the PHP plates. Results and discussion: Operative treatment allows to reach the ideal position of fragments, to perform stable fixation of fragments and to shorten the stay in the hospital due to early mobilization. Decompression of the hip joint reduces the risk of avascular necrosis of the femoral head. Surgical treatment is a method of choice, because prolonged immobilization leads to the formation of bedsores and infectious complications. Conclusions: Conservative treatment methods don't allow achieving accurate repositioning, which can lead to the formation of coxa vara, late consolidation and nonunion fracture. In the post-traumatic period, blood supply of the neck' of the femur is very poor, so consolidation is possible only in conditions of an adequate position of the fragments and their stable fixation. Hemarthrosis increases the probability of avascular necrosis of the femoral head and requires surgical removal by to use careful surgical access. Surgical treatment makes it possible to mobilize children in the first postoperative day and carry out early verticalization.

Date: 2018-10-11

Session: Paediatrics Free Papers (I)

Time: 16:00 - 17:30

Room: Room 524a

Abstract no.: 50894

THE CLINICAL EXPERIENCES OF MRI APPLICATION IN DDH CLOSED REDUCTION

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Developmental dislocation of the hip (DDH) is one of the most common deformities in lower extremities. We observed the labrum position, femoral head signal, medial hip joint space and outcome in 129 DDH hips after close reduction. There were 99 girls and 10 boys at average age 15.6 months. We obtained the MRI imagines before surgery, right after reduction, 3-month follow-up and one-year follow-up, in the mean time pelvic X-ray was taken either. The result showed that fair outcome was 82.7% in girls and 40% in boys, 100% fair hips at the age younger than 12 month while 82.42% at age 13 months to 18 months kids, and 78.57% at the age 19 months to 24 months. Based on Tönnis classification, the best outcome was in Grand III (91.01%). There is no significant difference of Hip Joint Space among gender, age and dislocated grade. 33.68% inversion of acetabular labrum changed to eversion during close reduction, and 89.47% inversion to eversion of labrum after 3 months follow-up. We observed MRI abnormal signal of femoral head in 12 hips. Three of them (25%) were showed avascular necrosis of femoral head according to pelvic X-ray in 1 year follow-up. We concluded that gender related with close reduction outcome, acetabular labrum could change from inversion to eversion for months after close reduction; the outcome of close reduction was no significant difference at age 13 to 18 months compared with 19 to 24 months. MRI abnormal signal was not an absolute indication for AVN.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 52697

KEY NOTE LECTURE: INFECTIONS IN CANCER

Rodolfo CAPANNA

., . (ITALY)

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 50715

BIOCHEMICAL VARIABLES ARE PREDICTIVE FOR PATIENT SURVIVAL AFTER SURGERY FOR SKELETAL METASTASIS: A PREDICTION MODEL DEVELOPMENT AND EXTERNAL VALIDATION STUDY

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Background: Predicting survival for patients with metastatic bone disease in the extremities (MBDex) is important for ensuring the implant will outlive the patient. Hitherto, prediction models for these patients have been constructed using subjective assessments, mostly lacking biochemical variables. Objectives: To develop a prediction model for survival after surgery due to MBDex using biochemical variables and externally validate the model. Methods: We created Bayesian Belief Network models to estimate likelihood of survival one, three, six, and twelve months after surgery using 140 patients. We validated the models using the data of 130 other patients and calculated the area under the Receiver Operator Characteristic curve (ROC). Variables included: hemoglobin, neutrophil-count, C-reactive protein, alkaline phosphatase, primary cancer, Karnofsky-score, ASA-score, visceral metastases, bone metastases, days from diagnose of primary cancer to index surgery for MBDex, ischemic heart disease, diabetes, fracture/impending-fracture and age. Results: Survival probabilities were influenced by all biochemical variables. Validation showed ROC for the one, three, six, and twelve-months model: 68% (C.I.: 55%-80%), 69 % (C.I.: 60%-78%), 81% (C.I.: 74%-87%) and 84% (C.I.: 77%-90%). Conclusion: Biochemical markers can be incorporated into a prediction model for survival in patients having surgery for MBDex allowing surgeons to offer more objective and individualized treatment options.

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 49980

SURGERY DELAY DOES NOT INCREASE THE PERIOPERATIVE MORTALITY FOR PATIENTS TREATED FOR METASTATIC BONE DISEASE: NO NEED FOR RUSH INTO SURGERY

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Introduction: Treatment of metastatic bone disease (MBD) at highly specialized centers (HSC) will cause a treatment delay. As studies indicate treatment delay for non-pathological proximal femur fractures increases the risk of early mortality we hypothesized that treatment delay was a risk factor for early postoperative mortality when treating MBD of the proximal femur. Methods: A prospective populations-based multicenter study was conducted identifying patients having surgery for Fractured Metastatic Lesions of the proximal/diaphysial Femur (FMLF) (AO classification 31./32.) from May 2014-May 2016. Known risk factors for postoperative survival was obtained for adjustment in regression analysis (Karnofsky score, ASA-score, preoperative hemoglobin, major bone resection). Results: 85 patients underwent surgery for FMLF (HSC n=33, secondary surgical center (SSC) = 52). Mean treatment delay from fracture to surgery was 6 days (0-63) (HSC: 11 days, SSC: 3 days). Overall 30 day survival was 81 % (C.I.: 73-90) and 16 patient succumbed to disease during the period. Association with early postoperative death was not found in crude neither adjusted analysis (OR: 1.22; C.I.: 0.31-4.85; p=0.776) but patients treated at SSC had an OR 8.82; C.I.: 0.98-85.18, p=0.051 risk of mortality in adjusted analysis. Conclusion: Surgical delay when treating FMLF does not seem to influence postoperative mortality and the authors advocate for taking the time to perform thorough preoperative evaluation of patient performance and anatomical considerations and when necessary referral to HSC aiming to customize surgical intervention to individual patients rather than rushing into surgery.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 50768

A PHASE I TRIAL ON THE USE OF PHOTODYNAMIC THERAPY IN VERTEBRAL METASTASES

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Introduction: The spine is a common site of metastasis. Complications include pathologic fracture and spinal cord compression. Vertebroplasty (VP) and Balloon Kyphoplasty (KP) are minimally-invasive stabilization procedures. Photodynamic therapy (PDT) is a tumour-ablative modality that may complement mechanical stability afforded by VP/KP. This first-in-human study evaluates PDT safety when applied in conjunction with VP/KP. Methods: This dose escalation trial involved one light only control group and four light-drug doses (50,100,150,200J;n=6) delivered at 150mW from a 690nm diode laser by 800-micron optical fibers. Patients eligible for VP/KP in treating pathologic fracture or at-risk lesions were recruited. Exclusion criteria included spinal canal compromise or neurologic impairment. PDT is a 2-step binary therapy of systemic drug followed by intravertebral light activation. Light was applied via bone trochar prior to cementation. Drug/light safety, neurologic safety, generic (SF-36) and disease-specific outcomes (VAS,EORTC-QLQ-BM22,EORTC-QLQ-C15-PAL) were recorded through 6 weeks. Results: 30 (10 male,20 female) patients were treated (13 KP,17 VP). The average age was 61. Primary cancer sites were breast (36.7%) and lung (23.3%). No group showed significant increases in pain as defined by the EORTC-QLQ. The 50 and 100J groups showed significant reductions in pain compared to the control. The 50J group had the best response, comprised mostly of lytic tumors, an average power density of 12.1mW/cm² measured at various distances ranging from 1.2 to 2.4 cm, and 5/6 lesions located from L2-L5. Discussion: Vertebral PDT appears safe from pharmaceutical and neurologic perspectives. Ongoing study determining safe dose range and subsequent efficacy studies are necessary.

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 51007

CLINICAL ANALYSIS OF ZOLEDRONIC ACID AND IBANDRONATE IN THE TREATMENT OF METASTATIC BONE DISEASE

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Introduction: The aim of this study was to compare the efficacy and toleration of zoledronic acid and ibandronate in the treatment of metastatic bone disease. Methods: We retrospectively studied 26 patients with metastatic bone diseases which were histological diagnosed between 2008 and 2011. 12 patients were in zoledronic acid group and 14 in ibandronate group. All of the patients were treated with 4mg zoledronic acid every four weeks, or 4mg ibandronate for four consecutive days and then 4mg ibandronate every four weeks. The visual analogue scale (VAS), skeletal-related event (SRE), time to first SRE (T-SRE), bone turnover markers were monitored during the follow-up. Results: Aute-phase (flu-like) reactions were recorded in zoledronic acid group. The pain of the Ibandronate group was palliated significantly compared to zoledronic acid group in the first month. VAS were significantly lower at the sixth month in both groups. There wasn't statistically significant for the change of bone turnover marker in the two groups. Ibandronate and zoledronic acid were similar in the parameter of SRE and T-SRE. Ibandronate was less affected the renal function compared to zoledronic acid seemingly, but there wasn't statistical significance ($p>0.05$). Conclusions: Both of the two bishosphonates have good therapeutic effect and tolerance. The adverse effect of Ibandronate is lighter than zoledronic acid. The loading dose administration of Ibandronate could rapid relief of metastatic bone pain than zoledronic acid, which may improve the quality of life better than zoledronic acid.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 50777

BONE METASTASES FROM RENAL CELL CARCINOMA

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Background: Treatment and prognostic factors for metastatic renal cell carcinoma (RCC) are not yet well described. We report a case of a patient with a unique clavicular metastasis at the initial presentation revealing a RCC managed surgically. The appearance of a second metastasis within two months has made the situation more problematic. Observation: A 39-year-old man presented for a pain with swelling of the right shoulder. Plain radiographs showed a lytic image of the external third of the clavicle. MRI revealed a hyper vascularized osteolytic process of the outer third of the right clavicle invading the acromioclavicular joint. A biopsy and an extension assessment concluded to a single metastasis of a RCC. He had resection of the primary tumor followed by resection of clavicular metastasis after embolization with healthy resection limits. The postoperative course was uneventful until two months, where he complained of left hip pain. New investigations showed the appearance of a metastasis of the coxal bone. After long discussions in a multidisiplinary staff the patient had a resection of the left hemi pelvis with hip arthrodesis. Discussion: Metastatic RCC have a poor prognosis due to the poor response to radiation and chemotherapy. Data suggest that 50% of patients died within the first year and 5-year survival does not exceed 10%. Conclusion: Management of Bone Metastasis from Renal Cell Carcinoma remains a problem to be solved. Surgical management has to be discussed in multidisciplinary staff but also with the patient before starting a heavy and risky surgery.

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 51039

CONSERVATIVE SURGERY IN PATHOLOGICAL FRACTURE BONE SARCOMA

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Introduction: Pathological fracture in bone sarcoma were for us a high risk factor of metastasis and local recurrence. Actually our attitude has become much more conservative. The aim of this study is to assess the oncological outcome. Methods: From January 2010 to September 2017 out of 229 cases of bone sarcoma 30 cases of pathological fractures had had a conservative surgery. These were 13 female cases and 17 male cases. The average age was 23,6 years old with extents ranging from 11 to 54 years. The histology of the tumors included 10 cases of osteosarcoma, 07 cases of chondrosarcoma, 06 cases of Ewing sarcoma and 01 case respectively of bone lymphoma, fibrosarcoma and malignant histiocytobroma. All patients had received a preoperative and postoperative chemotherapy. Results: The average follow-up was 2 years (4 months - 5 years). 06 cases developed local recurrence treated with secondary amputation. 04 cases developed lung metastasis and 03 cases died. Discussion: survival is similar in patients treated with amputation and those treated with resection. The incidence of local recurrence is similar with those who had no fracture (20%) . Conclusion: considering the data of the literature and those of our series a pathological fracture of bone sarcoma does not appear to be a formal contraindication for conservative surgery since the oncological results are acceptable.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 50565

MIREL SCORE IN PATHOLOGICAL FRACTURE DUE TO METASTASIS IS HELPFUL ONLY FOR UPPER FEMUR REGION

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Mirel score in predicting pathological impending fracture for prophylactic internal fixation is usually taken as a guide for fixing the bone before fracture occurs. As it helps in reducing morbidity of already sick patients due to primary malignancy and other associated co morbidities. As per this guide line score above 8 the bone should be fixed before fracture occurs. This holds true for peritrochanteric region as in most of the lesion in this region come with fracture directly to surgeon. In many cases even primary is unknown and only after fracture it is diagnosed but in other bones it is not much applicable as patient with lesion even multiple in single bone or multiple bones continue walking and working , may c/o pain or not. In other long bones even more than 2/3 of cortex destroyed, lesion is lytic even then fracture does not occurs of course if lesion keep on increasing ultimately bone will fracture. Many times patient pain and lesion will regress due to chemotherapy. This is especially true in multiple myeloma. in multiple myeloma multiple lesions are seen even then fracture does not occurs. So one has to take decision on individual basis while thinking of prophylactic fixation. This also does not hold true for spine where other guide lines have been given. So this mirel score is applicable only in upper femur region metastasis. In other regions of bone as diaphyseal, metaphyseal many other factors work why in some fracture occurs and in some does not.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 51941

FUNCTIONAL OUTCOMES OF ARTHRODESIS OF THE KNEE AFTER TUMOUR RESECTION USING BONE CEMENT WITHOUT BONE GRAFTS: MID-TERM RESULTS

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Limb salvage operations using endoprostheses is the treatment of choice for malignant bone tumors and aggressive lesions around the knee. However, resection-arthrodesis offers a satisfactory solution in few subsets of patients. We studied the functional outcome of resection arthrodesis done for tumors around knee joint by using bone cement, intramedullary K-nail, and locking plate at All India Institute of medical sciences, New-Delhi, India. A total of 20 patients treated by this technique from 2012 to 2017 were reviewed. In these patients, arthrodesis after tumor resection was done by wrapping bone cement around K-nail. The nail was inserted in the tibia first followed by pushing the nail retrogradely in the femoral canal by hand or by the help of a plier. To provide additional stability locking plates with unicortical locking screw were used. Bone cement was then wrapped around K-nail and attempt was made to make a collar of cement around the cement-bone junction at both the ends. Out of 20 patients, two underwent a/k amputation for recurrence of the tumor, three patients had the infection, four patients died due to metastasis and other complications. One patient underwent endoprosthesis reconstruction after two years. The mean follow-up period was 36 months. All patients had a noticeable limp, and inconveniences in doing activities of their daily living. However, some of them were able to return to their previous occupations. This technique of resection-arthrodesis can be attempted in tumor with extensive soft tissue involvement, irreparable extensor mechanism and patients with financial constraints.

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 51215

MYOFIBROBLASTIC SARCOMA OF BONE: CLINICAL OUTCOME HIGHLIGHTS THE CHALLENGES OF DIAGNOSIS AND TREATMENT

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Diagnosis and treatment for myofibroblastic sarcoma of bone are challenging because of its rareness and benign-like appearance. Here, we reviewed patients treated in our center between 2009 and 2016, who were finally pathologically diagnosed as myofibroblastic sarcoma of bone. A total of 22 cases were included and the average age was 33.9 years old. The tumors' location varies, including 12 in femur, 5 in humerus, 3 in tibia, and 2 in pelvis. Seventeen patients were admitted to our hospital initially (Group 1), and five patients were transferred from other hospitals because of misdiagnosis and recurrence (Group 2). There were 12 patients with IB disease and 10 patients with IIB disease according to Enneking staging system. Two patients have received shoulder disarticulation. The other 20 patients were received local tumor en-block resection following different limb-sparing reconstructions. All patients were followed-up with an average 47.4 months ranging from 1 year to 9 years. Five patients died because of multiple distant metastases, including lung, spine, brain, or pelvis. Two patients got local tumor recurrence. The one-year and three-year survivals were 84.1% and 70.7%, respectively. The overall survival of Group 2 patients was significantly worse than that of Group 1 ($P < 0.05$). This disease can be easily misdiagnosed to benign bone tumor such as fibrous dysplasia. Recurrence of this tumor leads to a higher malignancy with multiple distant metastatic potentials. Local tumor en-block resection is recommended. Patients who are suspected to be with this distinct sarcoma should be treated in a professional bone cancer center.

Date: 2018-10-11
Session: Tumours Free Papers
Time: 08:00 - 10:00
Room: Room 524c

Abstract no.: 49658

AGGRESSIVE GIANT CELL TUMOUR OF THE DISTAL FEMUR: TWO METHODS OF RECONSTRUCTION

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Background: There is a challenge about reconstruction of distal femur in GCT. This article analyzes the results of two methods of treatment. Materials and methods: Between 1994 to 2016, thirteen patients with aggressive GCT of the distal femur underwent resection. All of the tumors were categorized in grade three Campanacci classification. Two types of reconstruction were used after resection. In 9 of them, we used endoprosthesis for reconstruction and in the remaining 4 patients we did distal femur transepiphyseal osteotomy and segmental resection with extended curettage of remaining epiphyseal segment and reconstruction with intercalary allograft. The functional evaluation was done using the Enneking system of musculoskeletal tumor society (MSTS) score. Results: The mean follow up was 9 years. In the endoprosthesis group, the median MSTS score was 80% (24 out of the total score of 30) and in the last group, the median MSTS score was 76.6% (23 out of the total score of 30). There is one case of nonunion in the intercalary allograft group which united after second stage bone grafting. Conclusion: In undeveloped countries with socioeconomic problems, comparison to endoprosthesis reconstruction after tumor resection which is one of the best method of reconstructions, transepiphyseal osteotomy and segmental resection with extended curettage of the epiphyseal segment and reconstruction with intercalary allograft could be an acceptable option with satisfactory results in patients with aggressive GCT of distal femur. This option offers a biological reconstruction with preservation of the stabilizing knee ligaments along with mobile joint in comparison to knee arthrodesis or endoprosthesis.

Date: 2018-10-11

Session: Tumours Free Papers

Time: 08:00 - 10:00

Room: Room 524c

Abstract no.: 50628

ORGAN-SAVING SURGERY IN CASES OF METASTATIC DISEASE OF LONG BONES

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(UKRAINE)

Introduction: The treatment of patients with metastatic bone lesions is an actual problem of modern oncoortopedy. The main clinical markers of bone metastases are pain, pathological fractures, spinal cord compression and hypercalcemia. Surgical treatment is a palliative treatment method of patients with bone metastases. Materials and Methods: The clinical departments from 2009 to 2017 carried out surgical treatment for 89 patients with metastases in long bones. Segmental resection of bone with endoprosthesis replacement was carried out in 26 patients. According to the localization of metastatic lesions, hip replacement was carried out in 16 patients, the diaphysis of the femur and humerus - 4, elbow - 3, shoulder - 2, knee - 1. Reinforced metal osteosynthesis was performed in 31 patients. Metastatic lesions were located: the femur (19), humerus (8), the tibia (3), radius (1). Perosseous extrafocal osteosynthesis carried out in 32 patients. Metastatic lesions were located: the proximal femur (14), humerus (8), femoral shaft (3), tibia (3). After a surgical stage of treatment, patients received chemotherapy, hormonal therapy, immunotherapy, bisphosphonates and radiation therapy. Results: Postoperative complications amounted 3,4% and 5,6% of tumor recurrence. 25 patients died. 4 patients underwent fiber reinforced cement-bone fixation. Functional outcome was assessed in 64 survivors. Excellent results were in 18 (28,1%) patients, good - 31 (48,4%), satisfactory - 15 (23,4%). Conclusions: Endoprosthesis and reinforced metal osteosynthesis - basic methods used in the treatment of bone metastases. Perosseous fixation can be a support and self-treatment.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 52696

**KEY NOTE LECTURE: SHOULDER ARTHRITIS AND TREATMENT
OPTIONS**

Srinath KAMINENI

, . (UNITED STATES)

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 51920

3D FINITE ELEMENTS STUDY OF STRESSES IN THE WRIST AND EFFECT OF DIFFERENT OSTEOTOMIES USED IN KIENBÖCK'S DISEASE

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In Kienböck's disease, conservative surgical techniques aim to decompress the lunate. Many osteotomies are proposed. Seven procedures were compared by the authors. To validate the comparison a 3D finite elements model was used. The radius axial shortening (AS), lateral closing (LC), medial closing (MC), the Camembert osteotomy without (C) and with Sennwald osteotomy (CS), the capitate shortening without (Ca) and with the hamate (CaH) shortening were compared. The model was obtained from the segmentation of CT scans of an healthy wrist and imported into a finite element calculation software (Abaqus-Dassault). Then different osteotomies were simulated and the contact forces and stresses were recorded. In the anatomical model, the loads towards the forearm are brought by the scaphoid at 56%, the lunate at 30%, the triquetrum at 14%. In AS they are respectively 41%, 29%, 28%; in LC 50%, 45% and 5%; in the MC 20%, 61%, 18%; in the Ca 79%, 11%, 10%; in CaH 70%, 5%, 25%; in C 53%, 29%, 18%; in the CS 80%, 0%, 20%. In this model, the osteotomies that best discharge the lunate are the CaH osteotomy and the CS osteotomy. Compared to initial model, the CaH osteotomy overloads ulna, whose contact force increases from 14% to 25%. In the CS, most of the stresses are supported by the scaphoid, the ulna overload is minimal and the lunate discharge is complete. The Camembert-Sennwald osteotomy seems, in this model, to best unload the lunate, without overloading the ulna.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 52122

ROLE OF PAX-7 AS A TISSUE MARKER IN A MANGLED EXTREMITY: A PILOT STUDY

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The rising incidence of mangled extremity has led to significant patient morbidity. A lot of research is going on at the micro cellular level for better understanding of tissue injury, repair and regeneration. PAX7 is one such transcription factor, a marker of satellite stem cells in skeletal muscle. A pilot study was conducted on 30 cases to see whether PAX7 expression of tissue near the zone of injury in mangled limb, actually increases, decreases or remains unaffected. All patients were segregated into 2 groups- group I with MESS score ≥ 7 and group II with score < 7 . For group I patients, amputation and for group II, limb salvage surgery was planned. Skeletal muscle samples from 3 different zones, where zone A represent mangled, zone B intermediate and zone C healthy part in group I, while pre and post debridement skeletal muscle samples in group II were sent. Although in group I, most of the samples from zone A to C showed increased staining pattern of PAX-7 in ascending fashion but it was statistically not significant. Whereas in group II, most of the muscle samples taken post debridement showed positive staining and it was statistically significant (p value 0.007). Increased expression of PAX-7 signifies increased recruitment of satellite stem cells near the injury zone thereby reflecting the activation of skeletal muscle regeneration cascade. Hence, increased staining of PAX-7 in tissues could be a viable marker for identifying potential regeneration of skeletal muscle post injury.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 51833

THE EFFECT OF BONE MARROW-DERIVED PROGENITOR CELL THERAPY TO IMPROVE FRACTURE HEALING IN A DIABETIC RAT CRITICAL SIZE DEFECT MODEL

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Endothelial progenitor cell (EPC) therapy has been used to promote blood vessel formation and optimize fracture healing, yet little is known about its effects on bone formation under diseased conditions. Thus, our study aimed to explore the efficacy of locally implanted EPCs derived from healthy and diabetic animals on bone defect healing in healthy and diabetic recipients. EPCs were isolated from the bone marrow and cultured under endothelial conditions for 7 days. EPCs seeded on gelatin scaffolds in medium were implanted in surgically created 5mm femoral defects to create six randomized treatment groups: 1) Diabetic Control, 2) Diabetic + Diabetic EPCs, 3) Diabetic + Healthy EPCs, 4) Healthy Control, 5) Healthy + Diabetic EPCs, and 6) Healthy + Healthy EPCs. The animals underwent biweekly radiographic assessment until the 10-week endpoint. Post-mortem specimens were collected and analyzed via micro-computed tomography. Cell-treated fractures in healthy animals achieved 100% union by 8 weeks irrespective of whether they received 'healthy' or 'diabetic' EPCs. In the diabetic cohort of treated animals, 70% of animals achieved union at the 10-week endpoint. Healthy animals that received diabetic cells demonstrated greater bone volume (BV) and fractional bone volume (BV/TV) to diabetic animals that received diabetic cells but did not significantly differ from healthy animals that received healthy cells. Our assessments of bone healing suggest that EPC therapy is effective in promoting fracture healing in diabetic animals with bone defects irrespective of the cell source, though the pathological condition decreases their healing capacities compared to matched healthy animals.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 51409

LEVELS OF INTERLEUKIN-6 AFTER FEMUR NAILING: REGULAR REAMERS VERSUS REAMER-IRRIGATOR-ASPIRATOR - A TRIPLE-BLINDED PROSPECTIVE RANDOMISED CONTROLLED TRIAL

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Introduction: Fracture shaft femur accounts to nearly 15% of all fractures. Fat embolism is one of the most dreaded complications causing significant morbidity and mortality. Although there is no sensitive/specific test to detect fat embolism, Interleukin 6 has been shown to be an effective diagnostic marker. Reaming theoretically increases the chances of fat emboli into the systemic circulation and hence Reamer-Irrigator-Aspirator system is presumed to be a safer alternative. We conducted a triple blinded prospective RCT to evaluate whether there exists any such benefits of RIA reamers over the conventional reamer system. Methods: 60 consecutive isolated closed femur mid shaft fractures who underwent Intramedullary interlocking nailing within 24 hours of their injury were considered for the study. they were randomised into 2 groups which was decided by computer-generated random numbers. the Surgeon, patient, the evaluator were blinded in the study. The levels of IL-6 were evaluated from the blood sample of the patients which were taken at the time of incision, during maximal reaming and 6 hours post surgery. The results were statistically analysed using chi-square test. Results: Both the groups were statistically comparable with relation to demography and fracture patterns. There was a lesser IL-6 levels in those patients who underwent reaming by RIA reamers and it was statistically significant ($p < 0.01$). There were no complications seen in either groups. None of the patients had Fat embolism syndrome in this study. Conclusion: Reamer-Irrigator-Aspirator reaming system is a safer and efficient alternative to the conventional reaming system.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 51232

PPG-KGN BIPHASIC NANO-DRUG RELEASE SYSTEM PRETREATED BMSCS ENHANCE OSTEOCHONDRAL REGENERATION IN MINIPIGS

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In osteochondral tissue engineering, mesenchymal stem cells (MSCs) are the most commonly used seed cells. However, disadvantages like insufficient sources and the limited chondrogenic differentiation ability of MSCs restrict the repair effect in repairing osteochondral defects. Kartogenin (KGN) is a small-molecule chondrogenesis-inducing agent that can stimulate the repair of damaged cartilage. However, KGN is generally poorly soluble in water, thereby making its efficient intracellular delivery difficult. Hence, a drug-delivery system that can efficiently deliver KGN into MSCs for enhanced differentiation efficacy and controlled intracellular release of KGN is highly desirable for clinical translation of stem cell therapy. In this study, we propose a new osteochondral repair strategy involving a novel biphasic KGN-release system based on the use of polyethylene glycol (PEG) and polyethylenimine (PEI) dual-functionalized nanographene oxide (PPG-KGN). Minipigs were used as experimental animals for this purpose. Osteochondral defects were created in the femoral trochlea, which was followed by biomimetic osteochondral scaffold implantation. Autologous BMSCs were obtained and cocultured with PPG-KGN in vitro; the BMSCs could take up PPG-KGN via endocytosis. Then, the autologous BMSCs were intra-articularly injected into the model joints after PPG-KGN uptake. KGN was intracellularly released from PPG-KGN in a biphasic model (quick/sustained release) that quickly initiated and maintained chondrogenesis differentiation. This model provides the advantages of both a fast-release dosage formulation, which acts quickly, and of a slow-release formulation, which has long-acting efficacy. This strategy overcomes the disadvantages of inadequate sources and limited chondrogenic differentiation ability of BMSCs, which has a better repair of osteochondral defects.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 49456

RIA DIAMETER INFLUENCES FEMORAL BONE STRENGTH, FRACTURE GEOMETRY AND AMOUNT OF HARVESTED BONE GRAFT

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Purpose: Treatment of large bone defects is still related to unsolved problems. This study's aim is to investigate the influence of the Reamer-Irrigator-Aspirator (RIA) diameter on femoral bone strength, reaming and fracture geometries, and amount of harvested graft in a human cadaveric model. Methods: 45 pairs fresh-frozen human femora were randomized to 3 paired groups with 15 pairs each. One femur of each pair was reamed with RIA at a diameter of either 1.5 mm (group 1), 2.5 mm (group 2) or 4.0 mm (group 3) larger than its isthmus, whereas its contralateral femur was left intact without reaming. Following, all specimens were biomechanically tested in internal rotation to calculate their torsional stiffness and torque at failure. Reaming and fracture geometries were visualized and volume of the harvested graft was determined. Results: Torsional stiffness decreased significantly after reaming in group 3, but not in groups 1 and 2. Torque at failure revealed significant decrease after reaming in all 3 groups. Group 1 revealed significantly higher rate of eccentric-reaming geometry and lower rate of fracture overlapping with the region of most reaming in comparison to groups 2 and 3. Fracture position along the femoral axis was not significantly different among the 3 groups. Collected bone graft volume was significantly bigger in group 3 compared to groups 1 and 2. Conclusion: RIA diameter of up to 4mm larger than the femur isthmus influences its torsional stability and fracture characteristics. Further investigations are still necessary to determine the maximum permissible reaming diameter.

Date: 2018-10-11
Session: Research Free Papers (I)
Time: 08:00 - 10:00
Room: Room 525a

Abstract no.: 52589

EFFECTS OF BATROXOBIN ON THE SURVIVAL OF RANDOM SKIN FLAPS IN RATS

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Introduction: How to enhance the survival of the random skin flap is significant in the plastic surgery. Methods: Dorsal McFarlane flaps were harvested from 40 Sprague-Dawley rats in 2 to 3 months old. 20 male rats were randomly assigned to the batroxobin-treated as experimental group, the other rats in control group with normal saline. Batroxobin or normal saline (5BU/kg/day) was administered via the tail vein once daily. On batroxobin day 2, superoxide dismutase (SOD) and malondialdehyde (MDA) were detected using test kits. On day 7, Flap survival rates were evaluated with transparent graph paper under direct visualization, the levels of inflammation were examined by haematoxylin and eosin (H&E) staining, and the expression of vascular endothelial growth factor (VEGF) was immunohistochemically evaluated. Microcirculation flow on the flaps were measured by laser Doppler flowmetry (LDF) in all rats. Flap angiography, according to a modified lead oxide-gelatin injection technique, were obtained and radiographed with a soft X-ray machine. Results: The mean survival area of the batroxobin group was markedly larger than that in the control group. Microcirculation flow increased to some extent. SOD activity was increased significantly while MDA level was significantly reduced. H&E-stained slices revealed that inflammation was inhibited in the experimental group. VEGF expression markedly increased in the batroxobin group. Compared to the control group, the microvascular imaging area range was significantly greater in the batroxobin group. Conclusions: This study verified that batroxobin can effectively improve random skin flap survival by promoting angiogenesis, inhibiting inflammation and reducing ischaemic reperfusion injury.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 52380

PLACEBO-CONTROLLED PROSPECTIVE STUDY TO ASSESS THE EFFICACY OF AUTOLOGOUS PLATELET-RICH PLASMA INJECTION IN BILATERAL EARLY OSTEOARTHRITIS OF THE KNEES

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Osteoarthritis knee has become one of the major cause of disability in the world. Among number of methods used for treating knee OA, the use of growth factors present in autologous platelet rich plasma has shown a promising results. The science being called as Orthobiologics or Tissue engineering, where human body's own regenerative potentials try to regenerate and rebuild the damaged tissues. The present study aims to assess the efficacy of Autologus Platelet Rich Plasma Injection in patients of Osteoarthritis Knees and to compare the PRP Injection in Osteoarthritis Knees with the Placebo effect of the Saline Injection. In this randomized, controlled, single blind, prospective study 30 patients of either sex with up to grade 2 osteoarthritis, were randomly given autologus PRP injection in one knee and normal saline injection in the other and followed up at 1 month, at 6 months and at 12 months period. Clinical outcomes were evaluated using VAS scale, modified Lequesne score and analgesic requirements during follow ups. The study showed that the group receiving PRP injection have significant reduction in VAS score at 1(p<0.05), 6(p<0.0001) and at 12(p<0.0001) months. Similarly the severity of disability was reduced as illustrated by the modified Lequesne score at 1(p), 6(p) and 12(p) months. The test group also showed no or decrease in analgesic requirement at 1(p), 6(p) and 12(p) months. The findings of the results support the use of autologus platelet rich plasma injection in the early osteoarthritis (grade 1 and 2) of the knees.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 52351

THE IMPACT OF SHOULDER POSITION ON ARTERIAL FLOW THROUGH THE UPPER EXTREMITY

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Introduction: Neurologic injuries during surgery are often attributed to compression or traction, however changes in arterial flow with manipulation of the upper extremity may compromise the extremity and represent an additional contributory factor. The purpose of this investigation was to measure flow through the arterial system of the upper extremity in four common positions used in shoulder surgery. Methods: Three human cadavers (four shoulders) were dissected to reveal the proximal subclavian and distal radial arteries, and positioned in an upright "beach chair" position. The cadavers were embalmed with a unique saturated salt solution which maintains soft tissue integrity and joint mobility. Blood flow between the subclavian and radial arteries was simulated using a pump approximating physiologic pressure, and fluid was collected from the radial artery to quantify flow over a span of 60 seconds in each position. Shoulder positions included neutral (no abduction and 0 degrees external rotation), 60 degrees of external rotation, 90 degrees of abduction, and 90 degrees of abduction with 90 degrees of external rotation. Results: No statistically significant differences were observed between flow rates in the neutral, externally rotated, and abducted positions. Flow rates however, decreased by 42% ($p = 0.016$) between the neutral and externally rotated and abducted position. Conclusion: This investigation suggests a significant decrease in arterial blood flow in full abduction and external rotation which may have implications in shoulder surgery and overhead physical activity. Furthermore, this embalming method provides a unique opportunity for the investigation of blood flow and extremity positioning.

Date: 2018-10-11

Session: Research Free Papers (I)

Time: 08:00 - 10:00

Room: Room 525a

Abstract no.: 52101

**EXPERIENCE OF LEGAL CLAIMS IN THE LAST 20 YEARS IN ENGLAND
IN ORTHOPAEDIC SURGERY**

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Introduction: The amount of damages recovered in legal actions against health care providers is increasing internationally. We were interested to discover the level of damages and the nature of claims within Orthopaedic Surgery in England. Method: A freedom of information (FOI) request was made to NHS Resolution, the body responsible for acting for the National Health Service (NHS) in England. The FOI request sought information into the nature and cost of legal claims over the last 20 years. The data provided the basis for further analysis to identify the leading causes of litigation and to examine the legal costs recovered. Results: The top ten causes of litigation were; unnecessary operations, poor outcome, unnecessary pain, joint damage, nerve damage, idiopathic fracture, amputation, fatality, pressure sores and limb deformity. The damages and the associated costs of both sides over the 20-year period had increased from £4,411,826 to £166,656,966, an increase of 3,677%. The proportion of the legal costs associated with claims has dramatically increased from 32.89% to 45.70% over the same time frame. Conclusion: The increase in costs over the last 20 years represents an astonishing level of increased damages and there is a disproportionate increase in legal costs. A large number of the causes of litigation are preventable and thus in the age of austerity it represents an unnecessary drain on health care resources. A solution that could reduce costs would be the adoption of a no fault system similar to New Zealand and Sweden.

Date: 2018-10-11

Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 52104

MICROHARDNESS AND CA/P RATIO OF TRABECULAR BONE AUGMENTED WITH POROUS TITANIUM IMPLANTS USING MICRO-INDENTATION SYSTEM AND ENERGY-DISPERSIVE X-RAY SPECTROSCOPY

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Selective laser melting (SLM) is an additive manufacturing technique with the ability to produce scaffolds for orthopedic applications. In this study, we evaluated the effect of porous titanium implants (PTI) manufactured by SLM and augmented in trabecular bone defect to influence on in vivo bone microhardness and Ca/P ratio. The pore size diameter was 800 µm and porosity was 80%. Their dimensions and structure matched those of the computer-assisted design. Their compressive strength and elastic modulus were around 100 MPa and 1.85 GPa, respectively. These parameters are comparable to those of trabecular bone. The implants were augmented bilaterally in the proximal tibia's epiphysis of 10 Chinchilla rabbits for 6, 12 and 25 weeks. The Ca/P ratio was measured at peri-implant critical zone ($0 < l \leq 500$ µm) using energy-dispersive X-ray spectroscopy (EDX). For micro-hardness the Vickers tests was performed. The significant difference ($p < 0.05$) in Ca/P ratio with maximal of 1.61 for 25 weeks was found. The microhardness was maximal (100 ± 4 VH) for 25 weeks. There was a strong, positive Pearson's correlation between Ca/P ratio and microhardness values ($r = .68$, $p < .001$). The results of this study suggest that PTI can induce the increasing of bone mechanical properties in perifocal layer. Additional implant results will be published in the near future. We hereby acknowledge the support of the Ministry of Science and Education of the Russian Federation, in accordance to the decree of the Government of April 9, 2010, №218, project number 03.G25.31.0234.

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Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 51366

ANALYSIS AND CHARACTERISATION OF FRACTURE PATTERNS THROUGH A NOVEL 'COLUMN SPECIFIC FRACTURE MAPPING' IN INTRA-ARTICULAR TIBIAL PLATEAU FRACTURES

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Although tibial plateau fractures represent only 1.3% of all bony injuries, they present with a wide array of fractures, varying from minor hairline cracks with excellent functional outcomes even after conservative treatment to challenging fracture configurations requiring highly experienced surgical hands. The purpose of this study was to characterize patterns of tibial plateau fractures with use of CT mapping and highlight its importance in pre operative planning and deciding best approach to the fracture. 125 fractures included 25 female and 100 male patients and classified by Schatzker and 3 column classification. Fracture lines and zones of comminution were graphically superimposed onto an axial template of an intact subarticular tibial plateau to identify major patterns of fracture and comminution. Co relation of Schatzker and 3 column classification was studied which pointed out that all proximal tibia fractures needs an in depth CT based analysis of fracture pattern and that fracture maps revealed common patterns besides few atypical fractures specially rim fractures. This fracture map of the tibial plateau was subsequently drawn. Tibial plateau fracture maps show recurrent patterns of fracture lines, revealing four major fracture characteristics. An understanding of these recurrent features of tibial plateau fractures can aid surgeons during diagnosis, preoperative planning, and execution of surgical strategies.

Date: 2018-10-11

Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 52455

AUTOMATED MEASUREMENT OF MUSCLE MASS USING CT SCANNING THRESHOLDS GAINS TIME, BUT MERITS CAUTION IN ELDERLY AND OBESE PATIENTS

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Muscle atrophy and fatty infiltration are two indicators of weakness and deconditioning in elderly patients. Although the lower limbs are readily scanned using CT or MRT, the post-processing of cross-sectional areas (CSA) is typically highly time consuming. Therefore, thresholds to automatically discern and calculate the fraction of contractile muscle have been suggested. Because precision errors are known for knee and ankle extensors only, we investigated multiple muscles including the hip. Methods: Thirty-seven sedentary patients underwent spiral CT of their lower limbs, and hip, thigh and calf muscles were manually or semi-automatically encircled, and CSA calculated. Results: Automated measurements showed excellent correlation with manually encircled CSA (Pearson's $r = 0.76-0.96$); especially in less fatty infiltrated muscles (0.96). A substantially shortened observer time by 70% ($p < 0.01$) was demonstrated. In muscles with a high fat infiltration (i.e. gluteal muscles), however, CSA was smaller when using thresholds and the Hounsfield attenuation number (lowered by fat infiltration) markedly higher, when compared to standard manual measurement. Conclusion: Automated CSA assessment using attenuation thresholds can be recommended in young and healthy individuals with low intra-muscular fat, because CSA and volume calculations can be highly facilitated, when monitoring muscle composition is not a priority. The use of thresholds in sedentary individuals allows a direct assessment of functioning contractile muscle, although the degree of fatty infiltration, a useful marker of health, is not collected. Whole muscle CSA assessed by any scanning technique might overestimate contractile muscle in sedentary individuals.

Date: 2018-10-11

Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 52416

IS THERE A DIFFERENCE BETWEEN THE WNT-SIGNALLING PATHWAY EXPRESSION IN HUMAN NONUNION VERSUS CALLUS?

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Fracture healing involves the coordinated participation of several cell types, steered by various signaling pathways. Despite increasing knowledge about these molecular/cellular mechanisms, 10% of fractures become a nonunion. The Wnt-signaling pathway plays a central role in bone development/homeostasis and has increased activity in fractures and early stages of osteogenesis. We studied expression of key Wnt-pathway signaling components in human nonunion and callus tissue using immunohistochemistry and RNA-sequencing. Callus and nonunion tissues were obtained during surgery. Patients were matched by age and location of fracture/nonunion. Immunohistochemistry was performed for Wnt-4, Wnt-10a, beta-catenin, DKK-1, frizzled-4, sclerostin, porcupine (PORCN), LRP5/LRP6. Immunohistochemistry images were graded semi-quantitatively. RNA-seq analysis and read-mapping was performed with assistance of Mayo Clinic RNA sequencing Core and bioinformatics. Active bone formation in callus showed strong staining for beta-Catenin. Wnt-receptors, Wnt-ligands and their antagonists were also expressed. No differences were seen in expression of Wnt-signaling pathway proteins between callus and nonunion tissue. Sclerostin showed strong expression in osteoblasts in callus. RNAseq showed differences in a subset of Wnt-signaling components that could have functional consequences for fracture repair. PORCN, which is critical for Wnt-ligand secretion, showed a trend of higher expression in callus vs nonunion. This agrees with the PORCN's role in bone development/homeostasis. There do not appear to be obvious differences in expression of Wnt-signaling pathway between human calluses vs. nonunion tissues. Because Wnt-signaling and other osteogenic pathways are important for bone formation, mining of unbiased RNAseq data may reveal novel drug targets for therapies to prevent nonunion fractures.

Date: 2018-10-11

Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 52216

A BIOMECHANICAL STUDY ON PULLOUT STRENGTH OF SUTURE ANCHORS VERSUS HEADLESS SCREWS IN AVULSION FRACTURES OF DIFFERENT THICKNESS

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Suture anchors and headless screws are commonly used for avulsion fractures, but no studies compared these 2 methods in avulsion fractures of different thickness. We conducted a study to compare pullout strength and displacement of these 2 instruments (3.5 mm metallic suture anchor V.S. 30 mm long all-threaded 4.0 mm headless screw) in avulsion fractures of different thickness in animal models. 1-year-old porcine heels with Achilles tendon were used and randomized into 2 treatment groups. Each group was divided into 3 subgroups according to thickness of fracture fragments (5 mm, 10 mm, 15 mm). Load-to-failure and cyclic loading tests were both performed by directly pulling the tendon. In load to failure and cyclic test, peak failure load in the group of headless screws increased in proportion to thickness of fragment, but not in suture anchors. Comparing performance of suture anchors and headless screw in the same thickness of fragment, peak failure load in suture anchor group only surpassed headless screw when thickness was 5mm. All the 5mm samples fixed by headless screws failed in cyclic testing. For 10mm and 15mm fragments, the group of headless screws showed non-inferior peak failure load to suture anchors; besides, the displacement of fracture fragment after 500 cycles was significantly less in headless screw fixation than in suture anchors. From our studies, headless screw fixation in avulsion fractures of thickness of fragment equaling 1/3 and 1/2 of screw length had comparable resistance to pulling, and showed even less displacement after cyclic loading.

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Session: Research Free Papers (II)

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Room: Room 525a

Abstract no.: 51592

FIRST TIME DESCRIPTION OF AN OSSEOUS MIDLINE MARGIN (CRISTA VERTEBRALIS MEDIANA POSTERIOR) IN THE LUMBAR SPINE AND ITS SIGNIFICANCE IN THE OPERATIVE TREATMENT OF SEQUESTRA IN HERNIATED VERTEBRAL DISC

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Herniated disc disease are removed often using microscopic techniques. Unilateral sequestra are a challenge for the removal. The risk of sequestrum dislocation to the contralateral side of the vertebral canal is unclear. Surgical options are a one side or a two side approach. The decision-making is based on personal opinion. Therefore we performed an anatomical study. In a former study we observed a midline membrane and a not yet described bony ridge. This ridge was located on the concave side of the vertebral body in the midline. Methods: 59 lumbar vertebral bodies of 12 adult lumbar cadaver specimens were examined. Only lumbar spines without spinal fracture and deformities were included. 1 lumbar body was excluded because of a deformity. The gender ratio was 1:1. The spine was dissected parasagittal and all structures of the ventral epidural space were scrutinized for the existence of a midline membrane and an associated bony ridge. All ridges were measured. Their relation to the vertebral body height and disc height was determined. Results: For the first time as far we know we showed the existence of a bony midline ridge. The structure were seen in all intervertebral spaces L2-L4. In the spaces L1 and L5 we found it in 30% of cases. The ridge was named „Crista vertebralis mediana posterior“. Conclusions: This spatial division inhibits the dislocation of a slipped disc to the contralateral side reliable. As consequence we conclude, that even a great sequestrum can be removed in the one side technique.

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Session: Research Free Papers (II)

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Room: Room 525a

Abstract no.: 52213

THE EFFECT OF ALENDRONATE-IMPREGNATED BIPHASIC CALCIUM PHOSPHATE SCAFFOLDS ENHANCED BONE REGENERATION IN A RAT TIBIAL DEFECT MODEL

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This study investigated the effect of alendronate (Aln) released from biphasic calcium phosphate (BCP) scaffolds. We evaluated the in vitro osteogenic differentiation of Aln/BCP scaffolds using MG-63 cells and the in vivo bone regenerative capability of Aln/BCP scaffolds using a rat tibial defect model with radiography, micro-computed tomography (CT), and histological examination. In vitro studies included the surface morphology of BCP and Aln-loaded BCP scaffolds visualized using field-emission scanning electron microscope, release kinetics of Aln from BCP scaffolds, alkaline phosphatase (ALP) activity, calcium deposition, and gene expression. The in vitro studies showed that sustained release of Aln from the BCP scaffolds consisted of porous microstructures, and revealed that MG-63 cells cultured on Aln-loaded BCP scaffolds showed significantly increased ALP activity, calcium deposition, and gene expression compared to cells cultured on BCP scaffolds. The in vivo studies using radiograph and histology examination revealed abundant callus formation and bone maturation at the site in the Aln/BCP groups compared to the control group. However, solid bony bridge formation was not observed at plain radiographs until 8 weeks. Micro-CT analysis revealed that bone mineral density and bone formation volume were increased over time in an Aln concentration-dependent manner. These results suggested that Aln/BCP scaffolds have the potential for controlling the release of Aln and enhance bone formation and mineralization.

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Room: Room 525a

Abstract no.: 51760

3D FINITE-ELEMENT MODELLING AND ANALYSIS OF CEREBROSPINAL FLUID FLOW IN THORACIC SPINE

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Finite-element analysis has already been a practical tool to simulate and study the mechanism of spinal trauma and degenerative spinal diseases. However, we hardly see its use in the analysis of CSF flow in the spine. In the current study, we investigated the dynamics and its force on the cord parenchyma using finite-element analysis. After the experimental sheep underwent MRI scans, using phase contrast technique, the data was transported into Mimics software, constructing a length of 50mm electronic simulation of the thoracic spine. We used ANSYS software to perform grid generation and processing. We used MFX-ANSYS and CFX to solve the solid and fluid fields, respectively. Especially, von Mises stress was study in the simulation and each part inside. In the simulation, the pressure of CSF flow displayed a slight gradient decrease from the inlet to the outlet. Its velocity at the left and right side was larger than that of the dorsal and ventral sides. The displacement of the internal surface of dura mater and pia mater along the flow was negligible. In the transection, the compression displacement of the spinal cord in anterior-posterior direction was larger than left-right direction. The distribution of von Mises stress on the spinal cord and each part inside showed a similar mode-smaller at the middle and larger at the ends. The comparison of the von Mises stress on parts inside the cord demonstrated: pia mater>gray mater>white mater. We found the concentration of the stress at both anterior and posterior horns in gray mater.

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Room: Room 525a

Abstract no.: 51138

PILOT STUDY: CLINICAL APPLICATION OF MG-BASED BIODEGRADABLE MATERIAL FOR FRACTURE FIXATION IN THE ADULT SKELETON

Patrick HOLWEG

Medical University Graz, Graz (AUSTRIA)

Background: Promising results have been achieved using magnesium based alloys as biodegradable implants. Currently, other elements like rare earth elements (E) are added to magnesium-based implants to influence the corrosion behaviour. Our research group invented the magnesium alloy BRI. MAG using magnesium, calcium and zinc to achieve highest demands on biocompatibility and a 100% absorbability. Objectives: The first in man study was designed as a prospective, non-randomized trial for the treatment of dislocated fractures of the medial malleolus with the Magnesium-based biodegradable implant in the adult skeleton. The primary objective of the trial was to study the safety and performance of the Magnesium-based biodegradable implant in humans. Methods: 20 patients were recruited for the study. The treatment of dislocated fractures of the medial malleolus with the Magnesium-based biodegradable implant was conducted. Study visits took place after 2,6,12,24 and 72 weeks postoperatively. After 6 weeks of follow up, the primary endpoints regarding safety and efficacy were evaluated. Long term effects assessment was realized after 6 months. In case of any radiological visible degradation products seen in a patient, the follow-up for those patients was extended to one year. Results: The fragment was properly stabilized using the magnesium screws. No dislocation was detected at any time. Bone healing was achieved after 6 weeks in all patients. At the 12 weeks evaluation, incipient resorption of the screws was noticed on radiological observations. No qualitative differences were found in comparison to the conventional Ti implant. Slow and homogenous degradation was visible at all magnesium screws.

Date: 2018-10-11

Session: Research Free Papers (II)

Time: 16:00 - 17:30

Room: Room 525a

Abstract no.: 49526

A NOVEL TANTALUM COATING ON POROUS SiC SCAFFOLD USING CHEMICAL VAPOUR DEPOSITION AND PRELIMINARY BIOLOGICAL EVALUATION

Hui XIE, Dewei ZHAO, Benjie WANG

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Porous tantalum metal is an ideal medical metal material. It can integrate with human soft / hard tissue. It is used to deposit industrial pure tantalum on glass carbon surface by chemical vapor deposition (CVD). is currently available for use in orthopedic applications. However, the relatively high manufacturing cost have limited its application to gain widespread acceptance. In this study, tantalum films were deposited on porous SiC scaffolds using CVD technology. The digital and scanning electron microscope (SEM) showed that the TA coating evenly covered the whole scaffold structure. X-ray diffraction analysis showed that the coating consisted of α and β phases of Ta. The application of whole bone marrow adherent separation from healthy rabbit bone marrow stromal stem cells, the cytotoxicity was detected by MTT porous tantalum, more porous tantalum cells group and titanium group and control group, observation of bone marrow stromal stem in porous tantalum metal on the adhesion and proliferation of cells with GFP staining and transmission electron microscope. Detection, application of porous tantalum PCR on the effects of bone marrow stromal stem cells induced osteogenesis. Osteonecrosis model was established and porous tantalum metal was implanted. The effect of porous tantalum metal on osteonecrosis was evaluated by evaluating the formation of new bone around porous tantalum metal. We have designed and manufactured a porous tantalum screw for the treatment of osteonecrosis of the femoral head or the fracture of the femur neck by demonstrating the clinical application of this technique to the production of implants.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52690

**KEY NOTE LECTURE: MANAGING THE SCHATZKER V AND VI TIBIAL
PLATEAU FRACTURES**

Joseph SCHATZKER

, . (CANADA)

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 51778

SELFIE RELATED MORTALITY: FOUR-YEAR EPIDEMIOLOGY OF A SELF-MADE DISASTER

Mohit JAIN¹, Kinjal MAVANI², David LIU³, Viachaslau BRADKO⁴

¹Texas children's hospital and Baylor college of medicine, Houston (UNITED STATES), ²Pravara Institute of dental science, Loni BK (INDIA), ³Baylor college of medicine, Houston (UNITED STATES), ⁴Texas childrens Hospital, Houston (UNITED STATES)

Ever since the Oxford has included the term 'Selfie', selfie related deaths have gained wide media coverage. However, global incidences and large scale demographic review has never been attempted. The purpose of this study is to obtain epidemiological characteristics of selfie-related death worldwide with the objective of clarifying that it is a behavior and not a mental disorder falsely claimed by hoax as "selfitis". We went online via Google, Bing and Yahoo to collect data of every reported incidences. Injuries not leading to death and non-selfie related cases were excluded and included cases were confirmed via multiple resources. From last 4 years, March 2014-March 2018, total 167 deaths occurred while attempting selfie in 113 incidents across the world. Mean age of the victims was 22.3 (8-66) and 73% were males. India is the most affected country with more than half of all cases. Russia and Pakistan are the next. Drowning, fall from height and rail accidents are the top 3 along-with many bizarre ones like grenade and air crash. Incidence rate has decreased after 2016, but female death percentage is increasing. Increasing popularity of social media and usage of smartphones with high quality cameras have uplifted the selfie behavior. Initiatives like Mumbai's "NO SELFIE Zone", Russia's selfie guidelines and Indonesia's "Safe Selfie Spot" have been proven effective. Practical inability to calculate odd ratio of mortality risk associated with selfie is definitely a limitation but considering non-fatal injuries and non-reported incidents, we highly recommend situational awareness before attempting a risky selfie.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52463

CAN BIOCHEMICAL INDICES SUPPLEMENT CLINICAL EXAMINATION IN DECISION-MAKING REGARDING LIMB SALVAGEABILITY IN EXTREMITY MUSCULOSKELETAL TRAUMA WITH VASCULAR INJURY?

Sameer AGGARWAL

PGIMER, Chandigarh (INDIA)

MATERIALS AND METHODS: Patients admitted in the Tertiary care Trauma Centre with extremity skeletal trauma associated with vascular injury of the extremity with clinical signs of ischemia of the injured limb were included in this study. Evaluation done by clinical signs, Doppler ultrasonography/CT Angiography. Venous blood sample was taken from a peripheral vein of the injured limb at time of admission and after 24 hours if they underwent a stabilization and a revascularization procedure. Control samples were taken from the cubital vein of an uninjured upper limb. Biochemical markers like pH, pO₂, pCO₂, spO₂, K⁺, Base Deficit, HCO₃, lactate were measured from ABG lab immediately after withdrawing sample and CK-MM after centrifugation using ELISA kits. **RESULTS:** Of the 74 patients included in the study, 55 patients were taken up for a revascularization procedure, 13 patients for primary amputation and in remaining 6 patients the circulatory status of the limb was good, no vascular surgery was recommended. If the level bicarbonate in the injured limb is less than 16.50 mmol/litre, Ph < 6.89 the probability of survival of the limb after a revascularization procedure is low and the injured limb will need an amputation eventually. Lactate levels although showed correspondingly lower levels associated with vascular injury did not show any statistically significant correlation with salvage or amputation. **CONCLUSION:** Along with clinical signs, low levels of Bicarbonate (<16.50mmol/L), pH(<6.89), and High levels of pCO₂, base deficit in the injured limb at the time of presentation are associated with a less favourable outcome-amputation.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 50655

**THE USE OF TELEMEDICINE FOR REMOTE TRAUMA CONSULTATION:
A SIMULATION STUDY**

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Objectives: Within a health care system which differs with respect to resources based on location, trauma patients pose a challenge due the inherent complexity of each injury requiring several diagnostic and therapeutic modalities. With the advances of technology, telemedicine may have a role for improving trauma care in rural environments by providing remote specialist teleconsultations. However, virtual representation through telemedicine may not provide the necessary clinical information for an appropriate evaluation. The objective of this study was to assess the effectiveness of remote teleconsultation compared to in-person assessment. Methods: This was a simulation study using General and Orthopaedic Surgeons as specialist teleconsultants to a referring physician in a rural environment. Participants were each randomized to complete three trauma scenarios with different interventions: standard Ceiling Panoramic Camera (CPC), Smartphone Videoconferencing (VC) and in-person evaluation as Control group. Situation Awareness Global Assessment Technique (SAGAT) was used to compare interventions' ability to relay clinical information to the teleconsultant. Results: The average SAGAT scores for Control, SV and CPC were 85%, 87% and 81%, respectively. Matched repeated measures ANOVA did not demonstrate a statistical difference between the SAGAT scores amongst the groups ($p=0.46$). Conclusions: This study demonstrated that telemedicine is an effective method of assessing and managing trauma patients remotely as compared to in-person evaluation. Although traditional single view camera designs have already shown promising results in several trauma centers, the vast availability, ease of use and low set-up costs make smartphones a valuable tool in providing care to injured patients in remote locations.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49799

THE USE OF EXTRACORPOREAL MEMBRANE OXYGENATION IN TRAUMA PATIENTS: A SINGLE CENTRE EXPERIENCE

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Department of Orthopedics and Traumatology, Vienna (AUSTRIA)

Introduction: Extracorporeal membrane oxygenation (ECMO) is the ultimo ratio for patients following cardiopulmonary failure due to severe traumatic injuries. Therefore, the aim of the present study was to assess whether there is an impact of the (1) time from trauma to ECMO-cannulation (2) type of ECMO, (3) severity of injuries and (4) complication on the mortality of the patients cardiorespiratory failure due to traumatic injuries. **Patients & Methods:** Between 1997 and 2016, 22 patients (8 females, 14 males) with an average age of 32.1 ± 19.0 years were admitted to our Level Ia trauma center. Patients were retrospectively evaluated for clinical characteristics and parameters such as trauma mechanism, survival, ISS, SOFA, GCS, GOS, time to ECMO, hospital- and ICU stay, surgical interventions, complications and infections. **Results:** Mean ISS and GCS at the hospital admittance were 30.7 ± 12.4 and 5.6 ± 4.7 respectively. The median time from trauma to ECMO cannulation was 2 hours. Venoarterial ECMO was applied in 18 cases (81,8%) and venovenous ECMO in 4 cases (18,2%). Eight patients (36,4%) survived and had a satisfying neurological outcome with a mean GOS of 4.8 ± 0.3 . The most common complication following ECMO cannulation was infection in 50% of our patients. Pneumonia occurred in 9 patients (41%) with a significant appearance ($p=0.001$) of *Candida albicans* pneumonia (66,7%). **Conclusion:** According to our data, the use of ECMO should be considered in the treatment of traumatic cardiorespiratory failure to increase survival rate. Survivors had no severe neurological impairment. *Candida albicans* pneumonia is a challenging complication following treatment with ECMO.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 51246

DIAGNOSTIC AND THERAPEUTIC MANAGEMENT OF ASSISTANCE TO THOSE SUFFERING WITH MINE-EXPLOSIVE TRAUMA IN THE CONDITIONS OF MODERN HYBRID WAR

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During the military conflict in the East of Ukraine we carried out an analysis of the current mine and blast injury. As a result of the analysis of 261 cases of mine and blast injury we identified clinical, clinical-anatomical, pathomorphological and clinical-epidemiological features of the current mine-blast injury. We developed a scale for assessing the severity of the victims with a mine-blast injury which we called the "GKO scale". The severity of injury and patient's condition is assessed according to the "GKO scale" 1 to 30 points and higher. According to this scale, all victims are divided into four categories at an early hospital stage depending on the severity of the trauma and the severity of the condition. Depending on the "GKO scale", each patient undergoes a certain amount of medical care in the early hospital stage of medical care. This made it possible to reduce the lethality and increase the survival rate of patients with a mine explosion injury, as well as significantly relieve the resources of the hospital in the mass admission of the wounded.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 51602

THE SYSTEMATIC NEUTROPHIL RESPONSE TO INTRAMEDULLARY NAILING IN RATS

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¹University Hospital Zuerich, Zuerich (SWITZERLAND), ²University Clinic
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Polymorphonuclear neutrophils (PMNs) are essential cells in the development of pro-inflammatory complications in trauma patients. Intramedullary nailing (IMN) for the treatment of Long bone fractures is associated with increased incidences of complications in trauma. This study was conducted to describe the systemic neutrophil response to IMN in rats. To do so we utilized Whistar rats and they were subjected to standardized femur fracturing and intramedullary nailing. Groups were terminated after 3,7 and 14 days of observation..Both the blood and lung neutrophil pools were analyzed by flowcytometry. Membrane receptor expression levels of Mac-1 (CD11b), LFA-1 (CD11a), L-selectin (CD62L) were compared between the compartments and over time. Intramedullary nailing causes an initial drop of neutrophil numbers in circulation ($p>0.01$). Moreover the blood neutrophil pool after 72 hours of observation was characterized by an increased cell receptor expression of CD11b and decreased CD62L-receptor membrane expression levels. This reflects activation of blood neutrophils. Neutrophil activation returned to normal values after 7 days of observation. Furthermore an initial increase of activated neutrophils in lungs was observed as well. Hereby we showed that IMN for the treatment of long bone fractures activates the cellular innate immune System, as demonstrated by a profound increased activation status of neutrophils in both blood and lungs. These findings might form the basis for new therapeutic interventions to prevent systemic inflammatory complications after trauma.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 52051

COMPARISON OF THREE DEVICES TO DIAGNOSE COMPARTMENT SYNDROME

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³McGill, Montreal (CANADA)

Intra-compartmental pressure (ICP) is the current accepted method in evaluating a compartment syndrome. Conventional methods for measuring elevated pressure in muscle compartments have required repeated ICP measurements over a short timeframe with instruments proven unreliable or dangerous. Methods: We compared newer technology with currently used devices for diagnosing CS. We performed in vitro testing studies and then compared the responses with a rat model. All devices were tested under single and continuous monitoring conditions. The devices were obtained from Stryker Inc., Synthes (J and J) and Myovue Inc. Myovue has a newer generation of sensors and is the only device with wireless capability. The devices were compared in pressure chamber studies with and without muscle under physiological conditions to determine time to change and absolute value for known pressure applied. A rat model in two modalities was then used. Intra-abdominal pressure and a tibial crush model was used to test the probes individually for validity. Results: The Myovue device had the most accurate readings. All these devices showed relative linear tracking with pressure changes. The Myovue device was better in its approximation to actual pressure and response change in relation to pressures. All these devices were tested in an ideal condition to maximize the ability to monitor pressure. It is known that the Stryker device does not respond in real-life situations with this same accuracy. This was once again reflected in the results obtained. An extremely accurate tracing of the pressure gradient was obtained with the MYOVUE device.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 50667

BASELINE VITAMIN D LEVELS, BONE TURNOVER MARKER LEVELS AND PATIENT CHARACTERISTICS IN A COHORT OF ADULT ORTHOPAEDIC POLYTRAUMA PATIENTS

Dennis MURPHY¹, Mikhail BEKAREV¹, Sara MERWIN², Evan MOSTAFA³, Afshin PARSIKIA¹, Neetha REDDY², Vafa TABATABAIE², Melvin Jr. STONE¹, Milan SEN¹

¹Jacobi Medical Center, Bronx (UNITED STATES), ²Montefiore Medical Center, Bronx (UNITED STATES), ³Albert Einstein College of Medicine, Bronx (UNITED STATES)

Introduction: Vitamin D is known to play a major role in multiple organ functions in healthy adults, including bone homeostasis. However, little data exists regarding the baseline characteristics and vitamin D levels in adult orthopaedic polytrauma patient cohort. This ongoing prospective study aims to describe baseline vitamin D and bone turnover marker levels, and correlate these metrics with patient characteristics in this cohort. Methods: Adult polytrauma (ISS \geq 16) patients, ages 18-65 years, with one or more orthopaedic injuries admitted to an urban Level I trauma center were enrolled. Serum 25(OH)-vitamin D, parathyroid hormone (PTH), collagen type I C-telopeptide (CTX), calcium, phosphorus, osteocalcin, and alkaline phosphatase levels were drawn on admission. Patients' demographic and clinical characteristics were recorded. Results: Seventeen patients have been enrolled to date, mean age 35.9 (SD \pm 10.49). Ten patients (58.8%) had open fractures. One patient (5.9%) was vitamin D sufficient ($>$ 30ng/mL). 5 patients (29.4%) had vitamin D insufficiency (20-29.9ng/mL), and 11 patients (64.7%) had vitamin D deficiency (\leq 19.9ng/mL). There was no correlation between patient age and vitamin D, osteocalcin, PTH, and CTX level. Alkaline phosphatase negatively correlated with age ($r=-.51$, $p=0.038$). Average ISS was 28 (SD \pm 7). There was no correlation between ISS and patient age. However, patients with at least one open fracture had an ISS that was an average of 9.5 points higher than patients without open fractures. Conclusion: Vitamin D insufficiency and deficiency are highly prevalent in adult orthopedic polytrauma patients. Guidelines for the identification and treatment of hypovitaminosis D in this cohort need to be developed.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 51467

OUTCOMES IN SCHATZKER TYPE 5 AND TYPE 6 TIBIAL PLATEAU FRACTURES TREATED WITH ILIZAROV'S CIRCULAR RING FIXATOR

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¹JSS HOSPITAL, MYSORE, Gangtok, Sikkim (INDIA), ²JSS HOSPITAL, MYSORE, mysore (INDIA)

INTRODUCTION: Fractures of the tibial plateau are the result of high energy trauma. Complications include joint stiffness, malunion, skin loss, osteomyelitis, and possible amputation. The Ilizarovs external fixator helps in minimizing these complications by allowing early weight bearing, minimal soft tissue injury and blood loss along with a stable fixation. **MATERIAL AND METHODS:** In our prospective study of 30 patients which included adults with open/closed Schatzkers type 5 and 6 tibial plateau fractures , we studied the outcome following surgery and implant removal using the modified hohl and luck criteria which includes functional (extensor lag, valgus or varus instability, knee range of movement, walking distance and pain) and radiological parameters (valgus/ varus deformity, depression of articular surface and osteoarthritis). **RESULTS:** In our study, out of 30 patients 53.3% patients had an excellent outcome functionally, whereas 23.3% had a good outcome, 13.3% fair and 10% had a poor outcome. Radiologically, 46.6% had an excellent outcome, 40% had a good outcome and 13.3% had a fair outcome. All the patients achieved union with a mean time of 23.9 weeks. Most common complication was pin tract infection in 13.3% patients. 60% of the patients could be mobilized immediately with the remaining mobilized within 1 – 4 weeks. **CONCLUSION:** Treatment of compound/ closed tibial plateau fractures with ilizarovs circular external ring fixator has proven to be advantageous in terms of early weight bearing and minimal soft tissue compromise. Excellent Radiological outcome is not necessarily associated with similar functional outcome.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 49918

INTERLEUKIN-6 AS A PREDICTOR OF EXPERIMENTALLY-INDUCED FAT EMBOLISM AND POLYTRAUMA

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Aims and objectives: To evaluate the role of interleukin-6 as a predictor of fat embolism and polytrauma experimentally. **Materials and methods:** An animal study was conducted in 32 New Zealand white rabbits. The animals were divided into 3 groups: Control, Atraumatic fat embolism and Polytrauma group. In Group I, we injected 6 ml of normal saline and in Group II we injected 0.2 ml of linoleic acid respectively in the peripheral vein. In the Group III we created bilateral femur and tibia fractures and fixed it with k- wires. Blood was taken before procedure and at 6, 12 and 24 hours to measure plasma IL-6 levels. The rabbits were euthanized at 24 hours and lungs were removed and stained for fat. **Results:** All animals in the fat embolism group and around 72.22% in polytrauma group had fat embolism. The IL-6 levels were raised in all the groups reaching a peak at 6 hours after procedure with a decline in the values at 12 hours for polytrauma and fat embolism group. IL-6 in the control group was stationary after an initial raise at 6 hour. **Conclusion:** In our animal study, among all the groups, the mean IL-6 value increases from the baseline with maximum rise seen in atraumatic fat embolism group at 6 hours, but statistically not significant. Even though the recent literature says that IL-6 is an early marker of fat embolism, still the diagnosis of fat embolism syndrome is clinical only.

Date: 2018-10-12

Session: Trauma Free Papers (Polytrauma)

Time: 08:00 - 10:00

Room: Room 517d

Abstract no.: 50312

**RECONSTRUCTION OF COMPLEX SOFT-TISSUE DEFECTS IN THE
EXTREMITIES WITH CHIMERIC ANTEROLATERAL THIGH
PERFORATOR FLAP**

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Introduction: The reconstruction of extensive three-dimensional defects in the extremities is a difficult challenge. Many attempts have been made to reconstruct such defects using the chimeric flap concept, enabling flaps with larger surface areas to be used while maintaining economical tissue use. The anterolateral thigh (ALT) chimeric flap is one of the most useful tools for the reconstruction of complex three-dimensional defects in the extremities. **Methods:** The defects were in either a lower (n =10) or an upper extremity (n =12). The area of the soft tissue defects ranged from 43×35 cm to 19×9 cm (mean, 25×18 cm), containing extensive, irregular, ring-like soft tissue defects or degloving injuries. **Results:** The mean dimension of skin flap was 19.8 11.2 cm. The mean dimension of fascia flap was 8.9×7.1 cm. The mean dimension of muscle flap was 11.1×7.5 cm. No total flap loss occurred. One patient presented with venous thrombosis, and re-anastomosis and vein grafting were performed. Two cases exhibiting partial skin graft loss at the site at which the fascia flap was inset were treated via secondary skin grafts. During a follow-up period of 18 monthse—30 months, patients were satisfied with the functional and aesthetic outcome. No serious donor-site complications occurred. **Conclusions:** The various tissue components and maximal freedom offered by chimeric tissue flaps associated with the same descending branch of the LCFA provide versatile coverage of large, complex, and irregular soft-tissue defects in the extremities.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 51086

DOES NOTTINGHAM HIP FRACTURE SCORE PREDICT MORTALITY IN DISTAL FEMORAL FRACTURE PATIENTS?

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Patients with distal femoral fractures are associated with high rates of mortality similar to neck of femur fractures. Identifying high risk patients is crucial in pre-operative medical optimisation, risk stratification anaesthetically and orthogeriatric input. Nottingham Hip Fracture Score (NHFS) has been validated as predictor of mortality in neck of femur fracture in those with score ≥ 5 as high risk. We investigated the validity of NHFS in predicting 1 year mortality of patients sustaining distal femoral fractures. All patients admitted to a level 1 major trauma centre with distal femoral fractures were retrospectively reviewed between June 2012 and October 2017. NHFS were recorded using parameters immediately pre-operatively. 92 patients were included for analysis with mean follow-up of 32 months, mean age of 69 (range 16-101). 56 (61%) of patients were female, 10(11%) were open fractures and 32 (35%) were periprosthetic fractures with 77 (85%) patients surgically managed. 41 patients were found to have NHFS ≥ 5 . Mortality at 30 days was 7% and 1 year was 33%. Patients with NHFS of < 4 had higher survival rate at 30 days (96%vs90%) and at 1 year (74%vs49%, $p=0.002$) when compared with those of higher risk (NHFS ≥ 5) On Kaplan-Meier plotting and Log-Rank test, patients with NHFS of ≥ 5 were associated with a higher mortality($p=0.0001$). NHFS can be used to stratify distal femur fracture patients, identifying those with high risks of mortality. NHFS is a validated tool not only for hip fracture but distal femoral fractures in risk stratifying patients for pre-operative optimisation and predictor of mortality at 30 days and 1 year.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 49627

PELVIC X-RAY MISSES OUT POSTERIOR PELVIC RING LESIONS IN ELDERLY PATIENTS

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Introduction: Pelvic fractures in elderly patients are usually associated with a low-energy trauma. The standard diagnostic tool is the plain a.p.-radiograph. In most cases, only pubic rami fractures are found. The goal of the treatment is the previous independence of the patient. But the restoration of patient's mobility is frequently obstructed by inadequate pelvic pain which can be caused by posterior pelvic ring lesion requiring different treatment protocol. The objective of this prospective study was to focus on the frequency of hidden concomitant posterior pelvic ring injuries. Material and Methods: Over a 2 year period, we evaluated using CT scanning the rate of missed posterior pelvic injuries in 38 cases (patients 70 years and older) where only anterior pelvic lesions were detected in the standard pelvic X-ray. The mean age of 13 men and 25 women was 78 years (70 – 88). Results: In 11 cases (29 %), the X-ray diagnosis was confirmed - only pubic rami fractures were detected in the CT scan. In remaining 27 cases (71 %), CT scan revealed a monolateral or bilateral sacral fracture. Conclusions: A combination of anterior and posterior pelvic ring injuries is much more often than assumed in the elderly. Sacral fractures are usually missed due to bowel gas projection, enteric overlay, and osteoporosis. That's why CT scan should be routinely performed in elderly patients with only pubic rami fractures present in the pelvic X-ray.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 49614

SURGICAL MANAGEMENT OF BICOLUMNAR FRACTURES OF THE ACETABULUM: A REVIEW OF RESULTS IN 38 CASES

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Introduction: Bicolumnar fractures, usually denoted as acetabular fracture with anterior and posterior wall accounts for approximately 20% of all acetabular fractures. Material and methods: The analysis of 38 surgically treated patients with high energy bi- columnar fractures in our tertiary hospital, showed that more than half of these patients had associated life threatening injuries. The mean age was 42 years, and two thirds of these patients were male. 40% of the patients showed a central hip dislocation. An associated posterior wall fracture was present in 30.8% and an acetabular (PW)roof comminution in 34%. Results: Osteosynthesis was performed at an average interval of 9 days. Several approaches were used for stabilization with a combination of plate and screw fixation in 68%. 30 patients (78.9%) could be followed after a mean of 24 months. The remaining 8 patients could be followed for 14 months only. Analysing patients with anatomically reconstructed hip joints patients had better results with 70% having no or mild pain and a good or excellent functional result. A joint failure was present in 15.8%. Conclusions: Both column fractures show satisfactory functional, clinical and radiological long-term results. Incidence of heterotrophic ossification (5%) and sciatic nerve palsy (19%) is high. The optimal results can be achieved with anatomic joint reconstruction.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 52142

THE CHANGING EPIDEMIOLOGY OF ACETABULAR FRACTURES: A NATIONAL TRAUMA REGISTRY STUDY

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¹Addenbrooke's Hospital, Cambridge, Cambridge (UNITED KINGDOM),

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Background: Acetabular fractures are rare with a reported incidence of approximately 3 per 100,000 person/year. Large scale epidemiological evidence is lacking and mostly limited to single centre database studies. This is the first study to provide population level evidence on acetabular fracture epidemiology in the U.K. Methods: This retrospective study reviewed patients admitted to hospital with acetabular fractures (2009-2016) using the Trauma Audit and Research Network. The primary outcome was acetabular fracture incidence. Secondary outcomes included age, treatment modality, mortality, length of stay and discharge destination. Results: 19,005 acetabular fractures were identified. A 4-fold increase was observed (912 in 2009 to 3,759 in 2016 ($r = 0.996$, $P < 0.0001$)) with an increase in crude incidence from 1.7/100,000 in 2009 to 6.4/100,000 in 2016 ($r = 0.995$ $p < 0.0001$). Most fractures occurred in males ($n=12545$ (66%)). A significant trend towards increased female incidence occurred (27% in 2009 versus 36% in 2016 ($p < 0.05$)). Median age at the time of fracture increased from 53.7 in 2009 to 60.7 in 2016 ($r = 0.95$, $p < 0.001$), the greatest proportion occurring in patients over 60 years (33% in 2009 versus 63.5% in 2016 ($p < 0.05$)). Operative treatment increased from 27.3% in 2009 to 40.4 % in 2016 ($p < 0.05$). Mortality at 6 months remained constant (3.7%). Conclusions: The incidence of acetabular fractures in the UK has increased significantly. The majority of this increase occurred in older patients with a trend towards increased incidence in female patients and operative treatment.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 52417

EARLY COMPLICATIONS OF PERCUTANEOUS SCREW FIXATION OF PELVIC RING AND ACETABULAR FRACTURES

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Fluoroscopy guided percutaneous screw fixation alone or in combination with other methods for fixation of pelvic ring and acetabular fractures has been evolving during the last decades. Our work aimed to assess the early complications encountered with this method. Data were prospectively collected during a 16 year long period. In cases of pelvic ring injuries percutaneous screw fixation was preferred whenever possible, while in cases of acetabular fractures it was used at undisplaced or minimally displaced fractures in young and adult patients, and as a compromise, mostly in the elderly. Patients were followed up until bony healing and complications related to the method were registered. Percutaneous screw fixation was performed in 43 pelvic ring and 30 acetabular fractures. There were 44 male and 29 female patients with an average age of 45,4 years (range 13 - 85 years). The average follow-up was 14,8 weeks. There were 21 complications in pelvic ring, and 6 in acetabular cases including 1 deep infection and 1 non-union. There were no major neurovascular complications. Majority of the encountered complications proved to be minor which have not altered the course of recovery. Anatomic reduction of acetabular fractures has been achieved only in non-displaced or minimally displaced fractures or in cases where the reduction was performed by an open method. Use of Matta's criteria is misleading in cases where the percutaneous method is chosen as a compromise. There is only a narrow indication of the percutaneous methods in acetabular fracture surgery.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 51547

CHALLENGES OF MANAGING ANTERIOR ACETABULAR FRACTURES WITH THE MODIFIED STOPPA APPROACH IN A DEVELOPING COUNTRY

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Introduction: Modified Stoppa approach has emerged in the last twenty years as a promising approach for fixation of anterior acetabular fractures. This prospective study was conducted to analyse our results with this approach and suggest the indications for its rationale usage in our country. Materials and methods: All patients with acetabular fractures, which required anterior fixation were operated by Modified Stoppa approach and prospectively evaluated between January 2014 to December 2016. Mechanism of injury, fracture type, operative time, blood loss, complications, radiographic and functional outcomes was analysed in all patients. Modified Merle d'Aubigne scoring was used for clinical grading, while Matta's grading was utilized for radiographic reduction quality. Results: Twenty nine [90.62%] patients out of the total 32 patients had excellent to good grading's on functional and radiographic results. About 97% patients were able to resume pre-injury activities including socially demanding activities like ability to sit cross legged and squat. Patient's operated early had better articular reductions as compared to those operated late. Conclusions: This approach may be considered as a feasible alternative to the standard ilioinguinal approach especially in early cases of anterior fractures of the acetabulum. Cases which present late (after 2 weeks) may not be attempted through this approach as scarring or granulation tissue may lead to inadequate visualization.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 50741

THE CLINICAL APPLICATION OF THE MODIFIED STOPPA APPROACH WITH SPRING PLATE FOR POSTERIOR COLUMN ACETABULAR FRACTURES

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¹Xi'an Honghui Hospital, Xi'an (CHINA), ²Xi'an Honghui Hospital, xi'an (CHINA)

Background: The modified Stoppa intrapelvic approach is gaining wide acceptance and treating several types acetabulum. But the application of Stoppa approach with spring plate for posterior column acetabular fractures is rarely reported. Objective: Investigate the feasibility and effects of modified Stoppa approach with spring plate for posterior column acetabular fractures. Methods: Between December 2013 and February 2016, 22 patients with involving posterior column acetabular were treated, including 16 males and 6 females. The causes included traffic accidents injury (11 cases), crash injury of heavy object (4 cases), and falling injury from height (7 cases). There were 10 cases of the simple posterior column, 7 cases of the posterior column and posterior wall fracture and 5 cases of the both column fracture. The operation time, blood loss, and complications were recorded. The effectiveness of reduction and the hip function were evaluated according to Matta score system and Merled'Aubigne and Postel score system. Results: The operation time was 80-150 minutes (mean, 100 minutes). The intra-operative blood loss was 300-900ml (mean, 480ml). Matta X-ray assessment showed anatomical reduction in 15 cases, satisfactory reduction in 6 cases, and unsatisfactory reduction in 1 cases. At the time of last follow-up, the results were excellent in 16 cases, good in 2 cases, general in 2 cases, and poor in 1 case, and the excellent and good rate was 90% according to the Merled'Aubigne and Postel hip score standards. Conclusions: The posterior column acetabular fractures can be treated with modified Stoppa approach with spring plate to obtain good exposure, less invasion, satisfactory reduction, stable fixation, and low complications.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 49644

THE MODIFIED STOPPA APPROACH VERSUS THE ILIOINGUINAL APPROACH FOR ACETABULAR FRACTURES: A CASE CONTROL STUDY

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BACKGROUND: The modified Stoppa approach was introduced to manage acetabular fractures instead of the ilioinguinal approach to reduce morbidity and improve outcomes. This study was designed to ascertain: (1) if functional and radiological results are superior to that of the ilioinguinal approach, (2) if the rate of complication was different. **PATIENTS AND METHODS:** Forty five patients who were treated with the ilioinguinal approach (Group A) at a mean follow-up of 38 months and 28 patients who were treated with the modified Stoppa approach (Group B) at a mean follow-up of 15 months were retrospectively reviewed. Functional evaluation of patients was made with measurement of range of motion, Harris Hip Scores (HHS) and radiographic parameters were subluxation of head of femur and reduction of fracture lines. **RESULTS:** The mean HHS (group A=74 [48-89] and group B=88.4 [75-97]) showed significant difference between the groups (P=0.001). At the final follow-up, the mean hip flexion was found to be 96.8 ± 10.4 and the hip extension was 8.2 ± 3.3 in Group A, while these values were 103.5 ± 12.2 and 10.69 ± 8.17 in Group B. This shows better range of motion in group B. There were 20 anatomic reduction in group B and 11 anatomic reduction in group A. The complication rate was 15% in Group A and 13% in Group B (P>0.05). **DISCUSSION:** Although complication rates were the same, Stoppa approach gives better results in the treatment of acetabular fractures.

Date: 2018-10-12

Session: Trauma Free Papers (Pelvis)

Time: 16:00 - 17:30

Room: Room 517d

Abstract no.: 51152

A PROSPECTIVE STUDY TO DETERMINE OPTIMAL TIME TO MEASURE HAEMOGLOBIN POST-NECK OF FEMUR SURGERY: DAY 1 OR DAY 0?

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Introduction: Neck of femur patients are usually elderly with significant co-morbidities. Blood loss during surgery can result in low haemoglobin levels requiring blood transfusion. Currently, our hospital measures haemoglobin levels day 1 post-surgery, with a restrictive strategy for transfusion. Our aim was to determine whether haemoglobin measured on the day of surgery, would identify patients who would require blood transfusion earlier, and subsequently reduce length of stay (LOS). Methods: We prospectively collected data for a duration of 5 months comparing haemoglobin measured at day 1 versus day 0. LOS was calculated for each patient. Results: 189 patients and 158 patients were recruited into the day 1 and day 0 haemoglobin cohorts, respectively. 163 day 1 cohort patients and 90 day 0 cohort patients remained at the end of 5 months. Data was analysed per protocol. 36% of patients in the day 1 haemoglobin group required a post-operative blood transfusion compared to 47% of patients in the day 0 group. Mean length of stay in the day 1 transfusion group was 17 days compared to 19 days in the day 0 transfusion group. Mean fall in haemoglobin from admission to post-operative haemoglobin levels in the day 1 group was 23 compared to 19 in the day 0 group. Conclusion: Day 0 haemoglobin post-surgery identified patients requiring transfusion early but did not appear to reduce LOS. Currently, whilst day 0 haemoglobin should not become standard practice, it may have a crucial role in patients identified to be at high risk of bleeding.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52721

**KEY NOTE LECTURE: RESTORATION OF BONE STOCK IN REVISION
ARTHROPLASTY OF THE ACETABULUM**

Allan GROSS

, . (CANADA)

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52512

MINIMUM 12-YEAR FOLLOW-UP AND REVISION RATE FOLLOWING METAL-ON-METAL HIP ARTHROPLASTY

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Recent literature from 2008 suggested that revision rates following MoM Hip Arthroplasty could be as high as 1 in 5 (20%) by 10 to 15 years. The main indication for revision is the adverse reaction to metal debris leading to local tissue destruction and failure of implants. The aim of this study is to determine our revision rate post MoM hip arthroplasty and determine if a correlation exists with raised metal ions. This is a retrospective cohort study of all patients who had MoM hip arthroplasty at our unit. 135 consecutive patients were included with a minimum follow up of 12 years since 2006. The mean age was 51 (30-82) years. Lab results were reviewed for metal ion (Chromium and Cobalt) levels and x-rays where obtained as routine follow up post procedure. Revision rate was 6.6% at 12 years mark. There was no statistically significant correlation between metal ion levels and revision surgery. The main indication for revision surgery was infection (2.9%). Revision rate following MoM hip arthroplasty is variable and is attributed to multiple factors. No correlation existed between revision surgery and raised metal ion levels.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52123

IMPLANT MIGRATION AND PATIENT-REPORTED HIP FUNCTION TWO YEARS AFTER PRIMARY UNCEMENTED THA: AN RSA STUDY

Dirk Jan MOOJEN¹, Amanda KLAASSEN¹, Nienke WILLIGENBURG¹, Loes VAN BEERS¹, Vanessa SCHOLTES¹, Lennard KOSTER², Bart KAPTEIN², Rudolf POOLMAN¹

¹OLVG, Department of Orthopaedic and Trauma Surgery, Amsterdam (NETHERLANDS), ²RSAcore, Department of Orthopaedics, LUMC, Leiden (NETHERLANDS)

Introduction: This is the first study to evaluate 2 year migration patterns and patient reported hip function after primary total hip arthroplasty (THA) with a C2 stem and Delta-TT cup (LimaCorporate). Methods: A prospective cohort (n=18, age=55±9 years, 13 female) completed RSA X-rays and Hip disability and Osteoarthritis Outcome Score Physical function Short form (HOOS-PS) scores at baseline, 6 weeks, 3, 6, 12, and 24 months post-surgery. Improvement in hip function and its relation with prosthesis migration were assessed using independent samples test and Spearman's correlation coefficients, respectively. Results: Subsidence of the C2 stem ranged from -0.40-4.91 (median=0.18) mm at 6wk and from -0.32-5.36 (median=0.22) mm at 2yr. Longitudinal rotation ranged from -3.74-4.54 (median=0.52) degrees at 6wk and from -2.18-3.81 (median=0.47) degrees at 2yr. Translation of the Delta-TT cup was most prominent in cranial direction, ranging from -0.17-0.81 (median=0.13) mm at 6wk and from 0.04-1.50 (median=0.38) mm at 2yr. Rotation of the Delta-TT cup occurred mostly around the AP-axis, ranging from -0.74-4.83 (median=0.22) degrees at 6wk and from -0.40-6.40 (median=0.33) degrees at 2yr. HOOS-PS scores improved from 49.0±19.5 pre-surgery to 8.33±7.92 at two year follow up (p<0.001). No significant correlations were observed between implant migration and patient reported hip function at 2 year (all Rsquared≤0.13 and p>0.16). Conclusions: Migration occurred mainly in the first six weeks post-surgery and stabilized afterwards, which seems promising for long-term implant survival. Patient reported hip function substantially improved, and was not associated with differences between patients in implant migration at two year follow up.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52265

VARUS FEMORAL ALIGNMENT IN CEMENTLESS TOTAL HIP ARTHROPLASTY: SURVIVAL ANALYSIS AT MORE THAN 13 YEARS OF FOLLOW-UP

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Introduction: Is the long term survival of a cementless stem with a femoral alignment in varus the same than a centered stem ? Methods: We analysed a continue series of 467 femoral stem, cementless, straight, completely coated with HAP and with a collar implanted between 1995 and 2005. Among these stems, we found 67 stems in varus of 5° or more, 268 stems centered, 82 in globall fill and 24 in valgus. We did an statistic analysis with Kaplan Meyer curves. Results: Population datas (age, sex, etiology, BMI) were equivalent. 17 patients died (25.37%) and 4 lost of FU (5,97%) in the varus series VS 76 (28,36%) and 23 (8,58%) in the centered series. We deplore 3 stem fractures, one varus stem and two centered stems. The stem survival after « failures all types » was : 96,2% for varus series, versus 81,3% for centered series, For end point « femoral loosening », the stem survival was 100% at 14 and 18 years. Discussion : The publications about femoral varus and cementless stems are very few, but all mention a good evolution in spite of a follow up shorter than ours. Our results are in conformity with the literature but at more than 10 years with no loosening and no migration in the two series in spite of shorter stem size in the varus series (12% vs 5%), with a highly significant difference (p<0,01). We also think that the collar protects these stems as that has just been published on the result at 25-30 years of the Corail stem (JOA2018). Conclusion: The varus femoral alignment of a cementless stem completely coated with a collar don't involve a problem of longevity so we can treat the coxa vara morphology without to use a.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52172

RESULTS OF MODULAR STEM IN REVISION OF FAILED HEMIARTHROPLASTY

Vijay KUMAR, Rajesh MALHOTRA
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The conversion of failed hemiarthroplasty to total hip Arthroplasty is a complex procedure with a high rate of complications including loosening and dislocation. The purpose of this study was to evaluate the clinical and radiological results of Modular S-ROM prosthesis for conversion of failed hemiarthroplasty. 45 patients underwent conversion of failed hemiarthroplasty to Total hip arthroplasty between January 2010 to December 2015. They were followed up clinico-radiologically at our institute for a mean period of 5 years (3 to 8 years). The mean Harris Hip Score improved from 38 to 93. 81.2% patients with groin pain and 94.45% patients with thigh pain had complete pain relief. There was one dislocation and no patient required further revisions. 2 patients died and 3 patients were lost to follow up. It was observed hemiarthroplasty failure resulted in retroversion of femoral stem. The modularity of S-ROM stem also helped in placing the stem in correct version. Use of modular stem like the S-ROM for conversion of failed hemiarthroplasty is a safe and a useful procedure which also holds the promise of reducing the risk of post-operative dislocation and loosening of the stem.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51945

EXTENDED TROCHANTERIC OSTEOTOMY COMPARISON OF THREE MODES OF FIXATION: METALLIC WIRES, CABLES, PLATE (A SERIES OF 157 CASES)

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INTRODUCTION: The trans femoral osteotomy was initially described by Wagner in 1987 and the extended trochanteric osteotomy (ETO) was described by Younger et al. in 1995 and is considered to be the gold standard technique for removal of well-fixed femoral stems. The purpose of this report is 1 to compare the different types of fixation metallic wires, cables, Metallic Reinforcement Plate (MRP) we have used in revision THA where an ETO was performed. 2 analyse the clinical and radiological outcomes of these devices at 1 year. 3 analyse the complication. **MATERIAL & METHOD:** It is a retrospective continuous monocentric series of 157 patients where an ETO was performed. It was fixed by an MRP in 17 patients, cables in 43, metallic wires in 97. The main outcome was the consolidation of the osteotomized femoral flap (OFF). Secondary outcomes were PMA score and complications occurred at 1 year follow up. Qualitative variable was presented as percentage, quantitative variables as mean or median, standard deviation and range. **RESULTS:** 157 patients (73 -46,5% females) were included. Mean age at surgery was 66.7 year (sd=10.63). Mean interval between index surgery and revision was 11.07 year (sd=5,67). Causes for revision and bone defects were comparable. At 1 year OFF is healed without displacement in 82% with metallic wires, 70% with cables, 88% with MRP. Not significant. **DISCUSSION:** Fixation of the femoral flap is a technical issue in ETO. Metallic wires and cables are the most commonly used to secure the fixation. Fixation with a metallic plate is reported in a few number of articles and may be helpful specially when a fracture of the OFF occurred during surgery.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51557

UNION RATE AND COMPLICATIONS OF EXTENDED TROCHANTERIC OSTEOTOMY (ETO) IN REVISION HIP ARTHROPLASTY

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H DUHB, Llanelli (UNITED KINGDOM)

Introduction: Extended Trochanteric Osteotomy (ETO) is a useful technique when performing revision THR. Objectives: Aim of this study was to evaluate the outcome following ETO in a single surgeon series, with emphasis on complications and union rates of the osteotomy. Methods: Retrospective case series of patients who had revision THR performed by senior author between 2003 and 2014, with clinical and radiological follow-up between 1 and 14 years. Results: ETO was performed in 166 cases of revision THR. The osteotomy was closed using Dall-Miles cables (2 or 3) in 82% cases, spider clamp in 12% cases or trochanteric plate in 6% cases. In 94% cases a solid bony union was achieved confirmed on follow-up radiographs. In 10 cases the bony union was not seen, but there was no displacement of osteotomy and position of cables remained unchanged. In 14 cases greater trochanter fracture was noted postoperatively and trochanter migrated proximally (5-10mm). One failure of fixation occurred within first 24 hours and a re-fixation was performed subsequently without adverse events. In one case trochanteric plate broke and greater trochanter migrated proximally due to its fracture and non-union. Patient did not require revision and reported minimal symptoms. No reaction to cables was noted in any of cases. Conclusions: is safe and useful technique that can be utilized reliably in revision hip surgery. When performed carefully and repaired promptly using cables and supported by autologous bone graft, it results in reliable union with relatively rare complications.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50662

DUAL MOBILITY TOTAL HIP ARTHROPLASTY FOLLOWING FAILED FIXATION OF PROXIMAL FEMORAL FRACTURES

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Objectives: Total Hip Arthroplasty (THA) for complicated fracture Neck Of Femur (NOF) has been reported to have good survival but with high dislocation rate. This study reports the early results of Dual Mobility (DM) THA following failed fixation of fracture NOF. **Material and methods:** Sixty two patients who had DM THA following failed fixation of proximal femoral fractures were prospectively evaluated. The mean follow up was 39 months and minimum of 2 years. The average age was 62 years (range 49-85 years). 24 of these fractures were sub-capital fractures and 38 in the trochanteric area. The underlying etiologies were non-union, secondary arthritis, avascular necrosis, fatigue failure or backing out of metal work and infection. In presence of infection, staged arthroplasty with an interim period of antibiotic loaded cement spacer before implantation of the definitive DM prosthesis was performed in 11 hips. X-rays were evaluated at 3 and 12 months and annually thereafter. The Harris Hip Score (HHS) was employed for evaluation. **Results:** 5 patients had died after the first year leaving 57 for the final evaluation. Cementless DM cups were implanted in 32 patients while cemented were employed in 30. Independent mobilization without aid was achieved in 38 patients, while 15 were using one crutch, 5 with frame and 4 with frame and one assistant. The mean HHS improved from 25 pre to 82 post ($P < 0.001$). Non of the patients had dislocation of the hip. Two patients were re-admitted to theatre for evacuation of hematoma and one patient had deep infection. **Conclusion:** DM THA achieves excellent postoperative stability and function even in high risk patients who receive this implant following failure of hip fracture fixation.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 51860

REVISION TOTAL HIP ARTHROPLASTY VIA THE DIRECT ANTERIOR APPROACH

Zachary POST, Andres DUQUE, Peter BOYLE, Alvin ONG, Fabio OROZCO, Danielle PONZIO

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Introduction: Primary total hip arthroplasty (THA) has been shifting from more traditional exposure techniques such as the direct lateral and posterior to the muscle sparing technique known as the direct anterior approach (DAA). Similarly, our institution has followed this practice in revision total hip (RTHA) arthroplasty in hope to accelerate recovery in our patients. The purpose of this study is to analyze the results of a subset of patients that underwent THA via the DAA. Methods: This study is a retrospective case series showing the outcomes of 91 patients that underwent DAA RTHA. We divided the cases into five groups for analysis: 1) femoral and acetabular revision (35 patients) 2) femoral revision (10 patients) 3) acetabular revision (20 patients) 4) Head and liner exchange (19 patients) 5) cement spacer (7 patients). Results: The groups were analyzed and we found that the average surgical time in minutes for group 1 was 94.4, group 2 was 121.8, group 3 was 82.0, group 4 was 65.8, and group 5 was 137.7. Hemoglobin change (g/dL) and estimated blood loss (ml) for group 1 were 3.15, and 314.7 respectively, group 2 were 3.29, and 350, group 3 were 3.02 and 277.5, group 4 were 1.56 and 200, group 5 were 2.11 and 450. Conclusion: This case series represents the expected outcomes of a THA revision surgery using the DAA. These results confirm that all aspects of THA revisions can be safely performed through the DAA.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52132

SHORT-TERM RADIOGRAPHIC AND CLINICAL OUTCOMES OF AN ULTRAPOROUS ACETABULAR COMPONENT IN PRIMARY TOTAL HIP ARTHROPLASTY

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Introduction: A recent publication has raised concerns about presence of radiolucencies and poorer clinical outcomes in some patients with new-generation 'ultraporous' acetabular components. This study was undertaken to compare radiographic lucency and post-operative function in patients who received an ultraporous component versus a matched cohort who received a traditional component. **Methods:** Our institutional database was queried for all primary total hip arthroplasty patients who received an ultraporous cup (Tritanium, Stryker) between 2012 and 2016, and matched them 1:1 to patients who received a traditional cup (Pinnacle, DePuy) within the same period based on: gender, age, body mass index, and duration of follow-up. Radiographs were evaluated for presence, and progression of radiolucencies around the acetabular components at 1 year and at latest follow-up. Pre- and post-operative Oxford-12 hip scores were also recorded. **Results:** Ninety-one patients in each group were assessed. Mean patient age was 70 years and mean body mass index was 30.6 kg/m². Mean follow-up was 1.9 years and 2.6 years for the ultraporous and traditional groups, respectively. No acetabular components were revised in this series. Greater incidence of radiolucency was noted in the ultraporous group at 1 year ($p=0.031$) and latest follow-up ($p<0.001$). Improvement in Oxford hip scores did not differ between the groups ($p=0.956$) at latest follow up. **Discussion:** Although similar improvements in functional scores were noted, acetabular radiolucencies occurred in a greater proportion of ultraporous cup patients, thus necessitating a longer term follow up of these patients to determine any clinical implications of these radiographic findings.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 49519

IMPACTION BONE GRAFTING IN THE LONG RUN

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There is a well defined technique in orthopaedics - the impaction bone grafting - mainly for acetabular revision. Following a literary overview was given in the subject of aseptic acetabular revision; author reports his personal experience in this topic. Material and methods: 202 total hip revisions have been followed. Aseptic acetabular revisions have been performed in 146 cases; deep frozen allograft was used in 121 cases. (Sloof technique: 102, acetabular reinforcement ring: 14 and X-change mesh: 5 cases.) The average age of the patients was 68 (33-89) years, and the average follow up time was 8,5 (2,5-11,5) years. D'Antonio classification, Harris hip score and x-R analysis have been performed for assessment. Results: According to the functional assessment the postoperative Harris hip score improved significantly. Complications: 2 dislocations, 2 deep infections-Girdlestone procedure, and 4 aseptic loosening with re-revisions. Conclusion: Using deep frozen allograft impacted alone in cavitory defects, deep frozen allograft and reinforcement ring or X-change mesh in combined or segmental defects with cemented cup is a safe method with excellent results.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 50661

CEMENTLESS DUAL MOBILITY CUPS AND BONE ALLOGRAFT FOR ACETABULAR RECONSTRUCTION

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Objectives: Dual Mobility (DM) TOTAL Hip Arthroplasty (THA) is a good alternative in difficult revisions with high rates of postoperative dislocations. This prospective study was designed to record a- the outcome of cementless revision DM cups b- the success rate of cementless cups combined with bone allograft as a construct in massive acetabular defects. **Material and methods:** 19 hips with massive acetateular defects were prospectively evaluated . Segmental superior and posterior acetabular defects were reconstructed using bulk fresh frozen allograft, while bone ships were impacted into the cavitary defects. Cementless porous and hydroxyapatite coated DM cups (Novae E or Coptos, SERF, France) with primary interference fit in addition to screw and peg fixation were employed in all patients. The modified Harris Hip Score and radiological evaluations were recorded. Cup position, stability and bone ingrowth at the cup-bone interface were evaluated. Wilcoxon test was used to compare pre to latest follow up results. **Results:** acetateular defects grade IIC to IIIB (Paproskey's) were reconstructed using bulk and impaction grafts. At an average 34 months follow up (minimum 2 years) all cups had evidence of bone ingrowth at the cup-bone interface. No dislocation was recorded. Incorporation of the impacted graft into cavitary defects was observed in 15/19 (79%). The HHS has improved from a mean of 29 pre to 85 points postoperatively (P= 0.001). **Conclusion:** Massive acetabular defects can successfully be reconstructed using a combination of cementless cups that incorporate with host bone in addition to bulk graft that maximizes the initial stability. DM articulation is a valuable alternative in difficult revision THA. However, longer term follow up are required.

Date: 2018-10-12

Session: Hip Free Papers (Hip Revision)

Time: 08:00 - 10:00

Room: Room 518a+b

Abstract no.: 52609

ACETABULAR RESTORATION IN REVISION TOTAL HIP ARTHROPLASTY UTILISING GAP II

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²Bone, Joint and related tissues research center, Akhtar hospital, Shahid Beheshti University of medical sciences, Tehran (IRAN)

Introduction: Major bone loss of acetabulum can criticize the revision hip arthroplasty. The Graft Augmentation Prosthesis (GAP) has been designed particularly as an implant for revision acetabular reconstruction. Previously we reported the outcomes of using GAP II in a limited number of patients. In current study, we increased the sample size and the outcomes were investigated in more number of patients underwent revision THA using GAP II. Materials and methods: There were 307 patients underwent revision THA in patients using GAP II cages. All patients classified as 3a or 3b of Paprosky classification and type III bone loss according to the system of the American Academy of Orthopedic Surgeons (AAOS). Results: There were 221 men (71.99%) and 86 women (28.01%) with an average age of 51.3 ± 21.7 years (range, 35–86 years). The MHHS improved significantly at the last follow-up compared with the preoperative MHHS ($P < 0.001$). The mean MHHS was 40 (range, 29-44) preoperatively and 92 (range, 86-95) at the last follow up. There were no major intraoperative complications during acetabular reconstruction. Conclusion: Our findings showed that using GAP II acetabular cage in the restoration of acetabulum in hip revision surgery is significantly desirable.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52683

**KEY NOTE LECTURE: LIMB SALVAGE SURGERY IN BONE TUMOURS
USING CUSTOM MEGA PROSTHESIS**

Mayil NATARAJAN

, . (INDIA)

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 49585

TOTAL KNEE ARTHROPLASTY IN PATIENTS WITH VARUS DEFORMITIES GREATER THAN 10°: SURVIVAL ANALYSIS AT A MEAN TEN YEARS FOLLOW-UP

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Introduction: Total Knee Arthroplasty (TKA) is a secure procedure with more than 90% survival at 10 years. The purpose of this study was to report both clinical and radiological outcomes of TKA with a varus > 10 degrees. The second objective was to identify risk factors for failure or bad clinical results. Hypothesis: Results and survey are comparable to TKA with lesser deformities. Methods: Eighty-two TKA (69 patients) between January 2004 and December 2008 with a varus > 10° were reviewed retrospectively. The endpoints were clinical: range of motion, IKS knee score, Oxford and SF-12 and radiological: HKA postoperative and the existence of radiolucent lines or loosening at last follow-up. Results: Sixty-three TKA (55 patients) were assessed with a mean follow-up of 10.9 years. The global IKS score significantly increased (p=0.04). Seven TKA needed a revision: 2 for sepsis, 4 for aseptic loosening, 1 for polyethylene wear, with an overall survival of 91.6% at 10 years. For aseptic loosening the survival rate was 94.7% at 10 years. Risk factors for failure were age (p=0.001), weight (p=0.04), and a postoperative HKA lesser than 175° (p=0.05) for aseptic loosening. Discussion: The hypothesis was confirmed: the results showed a significant improvement of function and quality of life with a survival rate comparable to those found in the literature for greater varus but also inferior to 10 degrees. Three risk factors have been identified suggesting increased surveillance in these cases.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52582

FIVE-YEAR FOLLOW-UP RESULTS OF TOTAL KNEE ARTHROPLASTY FOR VALGUS KNEES: SOFT-TISSUE RELEASE TECHNIQUE

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OBJECTIVE: To report prospective results of total knee arthroplasty (TKA) for valgus knees. **METHODS:** 120 women and 19 men aged 40 to 85 (mean, 75) years with valgus knees underwent primary TKA. Of the 219 knees, 143, 67, and 9 had type-I, type-II, and type-III valgus deformities, respectively. A preliminary lateral soft-tissue release was performed, and the tibia and femur were prepared. The tight lateral structures were released using the pie-crusting technique. In 93% of the knees, cruciate substituting implants were used. In knees with severe deformity and medial collateral ligament insufficiency, the posterior cruciate ligament was sacrificed and constrained implants were used. The Hospital for Special Surgery (HSS) knee score was assessed. **RESULTS:** Patients were followed up for 6 months to 5 years. All knees were clinically stable in both mediolateral and anteroposterior planes. No radiolucency was noted. The mean modified HSS knee score improved from 48 to 91 ($p < 0.001$). The mean tibiofemoral alignment improved from valgus 20 to 5 degrees ($p < 0.001$). The mean range of motion improved from 65 to 110 degrees. No complication yet in all patients except one superficial wound infection, which settled with IV antibiotics. **CONCLUSION:** Adequate lateral soft-tissue release is necessary in valgus knees. The choice of implant depends on the severity of the valgus deformity and the extent of soft-tissue release needed to obtain a stable, balanced flexion and extension gap, in order to achieve minimal constraint with maximum stability.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51548

TEN-YEAR RESULTS OF NAVIGATED TOTAL KNEE REPLACEMENT IN COMPLEX CASES

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Introduction: in the literature navigated TKA is still discussable. Now orthopedic surgeons research robotic technologies in TKA. From 2008 we performed 1200 navigated TKA with different deformities. Materials and methods: we isolated two groups of patients: 90 navigated TKA and 90 convenient replacements. We divided each group in 3 parts with severe (>20°) varus, (>20°) valgus and extraarticular deformities, 30 patients in each group. Mean follow up time in both groups was 86 months (from 78 to 118). The functional result was evaluated by KSS, Oxford and WOMAC scales. We analyzed navigation protocols in navigated groups. The implant survival evaluated by revision at any reason. Results and discussion: we identified mean implant survival in navigated groups: varus- 92,3%, valgus – 86,4 %, extraarticular deformities - 88,7%. In control group: varus- 89,4%, valgus – 82,4 %, extraarticular deformities - 80,3%. The scales showed better results in navigated groups. The main reason for revision was instability, the second reason was infection and it was almost equal in all groups. Moreover, greater difference was between valgus and extraarticular groups. In valgus deformity additional hyperextension was isolated in navigated group almost in 26 cases and navigated distal femur resection can be done more proper by navigation. In extraarticular group the proper cuts by navigation system were proofed by navigation protocols. The grate difference in 8,4% of instability in control group can be explainable, because in extraarticular deformity it's very difficult to do the proper cuts and balancing.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52259

DO COMPLICATIONS AFTER TOTAL KNEE ARTHROPLASTY PERFORMED FOR OSTEOARTHRITIS COMPARE WITH THOSE WITH TRAUMATIC ARTHRITIS?

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Introduction: The number of total knee arthroplasties performed for traumatic arthropathy (TA) is on the rise. Surgery demands meticulous planning and more resources when compared to primary total knee performed for osteoarthritis (OA). Materials and Methods: The NIS (National Inpatient Sample) database was analyzed. ICD 9 codes were used to compare common complications which occurred after TKA performed for TA and OA. The results were compared using Chi square tests. Sampling weights were used to produce national estimates. Results: 7,119,563 observations were included in the NIS database. 155,445(2.2%) TKA procedures were included; 10,725 patients were diagnosed with TA (1,017) or osteoarthritis (16,008). The national estimates were 5,085 for TA and 80,040 for osteoarthritis. There was no statistical difference observed between TA and OA groups for superficial wound complications (0.2 % Vs 0.13%), deep joint infection (0.098% vs 0.094%), acute venous embolism and thrombosis deep vessels of lower extremity (0.2% vs 0.06%). There was no pulmonary embolus recorded in TA group compared to 0.10% for OA. The following comorbidities were significantly higher in OA group: hypertension($p<0.0001$), hypothyroidism ($p<0.0001$), obesity ($p=0.0006$), fluid and electrolyte disorder ($p=0.02$). Whereas, drug abuse ($p=<0.001$) and psychoses ($p=0.028$) was significantly higher in TA group. Conclusion: It's evident from the data that the complication rate is comparable. This one-year data has limitations but projects preliminary numbers to understand the magnitude of the problem. Further work is in progress to analyze large dataset. Perhaps, national joint registry data would provide more accurate data in the future.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52281

ACCELEROMETER-BASED, HAND-HELD NAVIGATION FOR IMPROVED KNEE ALIGNMENT IN TOTAL KNEE ARTHROPLASTY: AN OBSERVATIONAL STUDY

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Background: Malalignment in total knee arthroplasty (TKA) has been associated with poor implant longevity and clinical outcomes. Despite highly skilled surgeons and other advancements, malalignment errors with the conventional intramedullary and extramedullary guides remain a matter of concern. While computer assisted navigation offers better accuracy, it is not yet widely adopted. Accelerometer-based handheld navigation offers the accuracy of computer assisted surgery, with the convenience of conventional guides. Methodology: In this observational study, we analyzed the alignment accuracy of a portable, accelerometer based navigation (ABN) system in 106 knees (60 patients) undergoing total knee arthroplasty. Results: The mean tourniquet time was 53.14 ±7.42 minutes. Of the 106 knees operated, mean mechanical axis was 1.00° ± 2.68° with 93 knees (87.73%) within the acceptable range (outliers: 12.27%). Femoral component within 3° perpendicular to mechanical axis was achieved in 93.39% knees and 89.62% knees had tibial component within 3° perpendicular to mechanical axis. The sagittal alignment of femoral and tibial components within the acceptable range was noted in 89.62% and 87.73% of knees respectively. Conclusion: The results of our study substantiate the alignment accuracy of accelerometer based navigation and offer encouraging insights regarding its use for total knee arthroplasty.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 50696

ASYMMETRICAL FEMORAL COMPONENT SIZING IN BILATERAL TOTAL KNEE ARTHROPLASTY, CAUSES AND OUTCOMES: A MATCHED COHORT STUDY

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Background: Theoretically, the error in femoral component (FC) sizing can affect postoperative functional outcomes after total knee arthroplasty (TKA), including range of motion (ROM), anterior knee pain, and flexion stability. Therefore, this study was conducted to determine and compare the causes and outcomes of patients undergoing bilateral TKA who had either asymmetrical femoral component (AFC) or symmetrical femoral component (SFC) sizes. Methods: We conducted a retrospective matched-pairs study comparing thirty-four patients who had undergone simultaneous and staged bilateral TKA using AFC size (Group I) and thirty-five patients with SFC size (Group II). Preoperative radiographic morphology of both distal femurs including anteroposterior/mediolateral diameters, anterior-posterior femoral offset, and postoperative radiographic data of FC comprising flexion and valgus angle were recorded. The postoperative functional outcomes including range of motion, anterior knee pain, knee society score, and functional score at 6 weeks, 3, 6, 12 and 24 months were compared. Results: There were no differences in morphology between left and right distal femurs from preoperative radiographic data in both groups. The postoperative radiograph showed a significantly greater FC flexion angle difference in group I vs. group II ($2.18^{\circ} \pm 1.29^{\circ}$ and $1.36^{\circ} \pm 1.08^{\circ}$, $P = 0.007$), while the other parameters were the same. The postoperative clinical outcomes were no distinction between groups. Conclusion: The factor associated with AFC size selection in bilateral TKAs is the different in FC flexion angle but not the morphological diversity between sides. The postoperative functional outcomes were not inferior in AFC size patients comparing with SFC size patients.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 52601

DOES KNEE PROSTHESIS AFFECT BLOOD LOSS IN SIMULTANEOUS BILATERAL TKA?

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Background: Various preoperative risk factors have been reported in association with perioperative blood loss (PBL). However, the effect of different knee prosthetic design on PBL is not well-defined in simultaneous bilateral TKA (SBTKA). This study aimed to compare the PBL and transfusion rate between SBTKA that implanted with different knee prosthesis. Methods: Demographic and perioperative data of patients underwent SBTKA, using either closed-box or open-box femoral component of posterior stabilized (PS), fixed bearing (FB) TKA, were reviewed. The data have been recorded in a prospective fashion at our institution. The PBL and blood transfusion rates were compared using multiple regression analysis, and adjusting for age, BMI, ASA, preoperative Hb, total operative time (TOT), and type of knee prosthesis. Results: Fifty-four closed-box and 56 open-box PS, FB TKA was not significantly different in preoperative parameters. The PBL of closed-box was 135.23 ml (95%CI:-215.30 to -55.16; p=0.001) less than that of open-box TKA, significantly. However, the blood transfusion rate of the closed and open-box SBTKA was not significantly different (24.07, and 38.46%, respectively, P=0.11). Estimated 3.75 ml (95%CI:1.75 to 5.76; p<0.001) of blood loss was anticipated for each additional minute of TOT. The odds of 71% (p<0.001) less blood transfusion was predicted for each additional mg/dL of preoperative Hb. Conclusion: The SBTKA with different knee prosthesis could result in significant discrepancy of calculated PBL, but not different for blood transfusion. Prolong operative time significantly increase PBL, while initial Hb is the only preoperative factor that affects the odds of blood transfusion.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 49963

VERTICAL LIMB OF EXTENSILE LATERAL CALCANEAL APPROACH LOCATION AND INJURY OF CALCANEAL BRANCH OF PERONEAL ARTERY: AN INJECTION ANATOMICAL STUDY

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Introduction: Extensile lateral calcaneal approach is a standard method for accessing joint depression type calcaneal fracture. However surgical wound complication rate is high. Previous studies showed a calcaneal branch of peroneal artery contributing to calcaneal flap supply. This study focuses on the location of vertical limb in this approach correlating to aforementioned artery and flap perfusion. Methods: Ten pairs of cadaveric lower extremity were used. Extensile lateral calcaneal approach was carried out on both calcaneus which its vertical limb was placed at the line between posterior border of lateral malleolus and lateral edge of achilles tendon for right side and at the lateral edge of achilles tendon for left. Identified vessel was ligated and cut. Horizontal limb of incision were carried out as usual. Completion of flap elevation was judged when subtalar joint and anterior process of calcaneus were totally exposed. Eighty degree celsius water was injected into popliteal vessel via feeding tube. Thermal images were taken pre- and post-injection. Dye was injected subsequently and perfusion was recorded in video format. Result: Mean pre- and post-injection skin flap temperature difference was higher significantly on left side (5.36 vs 0.72 degree, p=0.0002) Dye perfusion was significantly better on left side. Calcaneal branch of peroneal arteries were found at the incision in all specimen for right side with average distance 21.19mm proximal to calcaneal tuberosity but one was found in left side which dye perfusion still appeared normal. Conclusion: Vertical limb of incision should be placed at lateral edge of achilles tendon.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty II)

Time: 08:00 - 10:00

Room: Room 519a+b

Abstract no.: 51788

ASPIRIN IS A SAFE THROMBOPROPHYLAXIS FOR JOINT ARTHROPLASTY

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Background: Venous thromboembolism is a major complication of hip and knee arthroplasty. Prophylactic anticoagulant therapy has become standard of care for joint arthroplasty patients. There is a paucity in the literature regarding the choice for thromboprophylaxis. Aspirin is a promising alternative to traditional thromboprophylaxis regimens. Methods: A retrospective review of all patients undergoing total knee arthroplasty and total hip arthroplasty during a 5-year period at one institution was performed. History of thromboembolic incidents, type of surgery (primary or revision), thromboprophylaxis treatment after surgery, occurrence of deep vein thrombosis and pulmonary thromboemboli, and mortality were extracted for all patients. the results were then compared. Results: Of 2439 patient records gathered, 1586 (65%) were total hip arthroplasties and 856 (35%) were total knee arthroplasties. 2154 (88%) patients received twice daily 325mg Aspirin as thromboprophylaxis agent, and 285 (12%) received LMWH. In the Aspirin group, no case of DVT or thromboembolic incident was found. In the LMWH group, 2 cases of non-fatal pulmonary emboli were found. Both cases were revision surgeries. Conclusion: This study reiterates the growing body of evidence in support of aspirin as an effective thromboprophylaxis agents, with fewer complications than traditional heparin (conventional or low-molecular-weight) regimens.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 52030

PATIENT OUTCOMES FOLLOWING SINGLE RADIUS VERSUS MULTI RADIUS TOTAL KNEE REPLACEMENT

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Background: Theoretical advantages of single radius TKR are well publicised. The aim of our study was to compare the clinical outcome between a Single Radius (SR) and a Multi-radius (MR) knee. Method: A Single surgeon, prospective concurrent cohort study was undertaken as part of a procurement service evaluation. All consecutive patients in unit A received the SR knee and in unit B the MR Knee. Clinical evaluation was done at regular intervals using the Oxford Knee Score (OKS). Results: The two groups were comparable at baseline. The Mean age was 68.5 (SR) and 67.99 (MR), with similar sex ratio; mean ASA was 2.2 and 2.1 with BMI of 33.6 and 35.5 respectively. The mean preoperative OKS was 15.5 (SR) and 18.1 (MR) (p= 0.172). There were 4 complications in the SR group including two deaths (bowel necrosis & pulmonary embolism), a pseudoaneurysm and superficial wound discharge. The MR group had no complications. Excluding deaths, all patients were available (100%) for follow-up at 1 year. The mean improvement in OKS at 1 year was 15.4 (SR), and 13.9 (MR). This difference was not significant (p 0.552). Improvement was maintained at 2 years, 15.49 (SR) and 13.95 (MR) respectively. Eight MR group patients had a previous MR knee and seven SR group patients had received a previous contra lateral MR knee with no significant outcome difference identified. Conclusions: This Single Surgeon comparative cohort mid-term study did not show any statistically significant clinical benefits in the SR group as compared to the MR group.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50698

KNEE ARTHROPLASTY IN PATIENTS WITH PREVIOUS LIGAMENTOUS KNEE SURGERY: A MATCHED CASE CONTROL STUDY

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Background: There is limited data on whether previous ligamentous knee surgery (LKS) influences subsequent TKA. We evaluated the timing, constraint and outcomes of TKA in these patients. Methods: Consecutive patients undergoing TKA with prior LKS were 2:1 matched (age, sex and body mass index (BMI)) to primary TKA patients. We evaluated details of knee ligament, hardware removal and subsequent TKA surgery with clinical outcome scores. Mean follow-up was 3.6 years (1-34). Results: There were 129 patients: 43 cases with prior LKS and 86 controls with a mean age of 56.5 years (36-76) and 57.2 years (44-79) respectively (p=0.3). There were 30 (69.8%) males and 13(30.2%) females, a mean BMI of 31.2 kg/m² (23-43), similar to controls. The LKS group had prior ACL reconstruction 30(69.8%), revision ACL reconstruction 7 (16.2%), PCL reconstruction 3 (7%), LCL repair 2 (4.7%), MCL repair 2 (4.7%) and posterolateral corner/ LCL repair 1(2.3%). There were significantly more cruciate-sacrificing implants (33 (76.7%) vs. 26 (30.2%), p<0.001) than controls. Mean operative time and blood loss were similar with 17 (39.6%) hardware removals in the LKS group only. Complication (9.3%) and further surgery (11.6%) rates were almost double controls but statistically insignificant. There was 1 revision (2.3%) for polyethylene exchange in the LKS group. Mean SF-12 scores were similar with a significantly higher LKS group Lysholm knee score (78.3 vs. 65.1, p=0.04). Discussion: TKA with prior LKS often warranted hardware removal and more constrained implants, without any difference in operative times nor blood loss. Outcome scores are good overall, but the potentially higher complication and further surgery rates with prior LKS require further investigation.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 52140

ACCELEROMETER-BASED PORTABLE NAVIGATION IN TOTAL KNEE ARTHROPLASTY, A FASTER GUIDE WITH ACCURACY COMPARABLE TO IMAGELESS, COMPUTER-ASSISTED NAVIGATION: A PROSPECTIVE RANDOMISED STUDY

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Background: Malalignment in total knee arthroplasty (TKA) has been associated with poor implant longevity and clinical outcomes. Despite highly skilled surgeons and other advancements, malalignment errors with the conventional intramedullary and extramedullary guides remain a matter of concern. While computer assisted navigation offers better accuracy, it is not yet widely adopted. Accelerometer-based handheld navigation offers the accuracy of computer assisted surgery, with the convenience of conventional guides. Methodology: In this non blinded single centre prospective randomized study, 50 patients (100 knees) undergoing TKA under a single surgeon, were randomly allocated to either imageless, computer assisted navigation (CAN) group or accelerometer based portable navigation (ABN) group. The clinical and radiological follow up at 1 year follow up were compared between the groups. Results: The mean tourniquet time in ABN group was 54.54 ± 5.68 minutes compared to 61.76 ± 13.79 minutes in CAN group ($p < 0.001$). Both the groups had 82% of knees aligned within 3 degrees of neutral mechanical axis. Femoral component within 3° perpendicular to mechanical axis was achieved in 86% knees in ABN group (vs 78% in CAN group) and 98% knees in ABN group had tibial component within 3° perpendicular to mechanical axis (vs 98% in CAN group). There was no significant difference in Oxford Knee Score ($p = 0.34$) and American Knee Society Score ($p 0.40$) between the groups, at 1 year follow up. Conclusion: Accelerometer based portable navigation provides clinical and radiological results comparable to imageless, computer assisted navigation with reduced tourniquet times.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50885

SEASONAL VARIATION IN THE OCCURRENCE OF DEEP VEIN THROMBOSIS AFTER TOTAL KNEE ARTHROPLASTY

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Aims: Patients undergoing total knee arthroplasty (TKA) are at high risk of venous thromboembolism (VTE). This study evaluated seasonal variation in the incidence of DVT in patients undergoing TKA. **Materials and Methods:** 334 patients enrolled in this study underwent primary TKA for osteoarthritis and received edoxaban 15 mg, for 14 days after surgery. The patients were divided into 4 groups; spring (March – May), summer (June - August), autumn (September – November), and winter (December – February) according to average monthly temperature. Incidence of DVT, D-dimer, and blood pressure (BP) elevation, which shows seasonal variation, was evaluated. **Results:** Percentage of patients developing DVT was 18.8, 30.3, 23.5 and 41.3 in spring, summer, autumn, and winter groups, respectively. The incidence of DVT in the winter group was significantly higher than that in the other groups. There were no significant differences between spring, summer, and autumn groups. The D-dimer levels increased gradually until postoperative day (POD) 14 and were significantly higher in the winter group than in other groups on POD 14. Systolic BP was significantly higher in the winter group, than in other groups, while both systolic and diastolic BPs were significantly lower in the summer group than in other groups. **Conclusions:** There is an increased risk of VTE in the winter season post TKA. Hypertension may be implicated as one of the cause of DVT in winter. A strict DVT prophylaxis and surveillance may be warranted in patients undergoing TKA in winter.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50695

USING IMMEDIATE POSTOPERATIVE KNEE RANGE OF MOTION PHOTOGRAPH AS A MOTIVATION FOR INCREASING KNEE MOTION AFTER TOTAL KNEE ARTHROPLASTY; CAN IT IMPROVE POSTOPERATIVE KNEE RANGE OF MOTION?: A PROSPECTIVE, DOUBLE-BLIND, RANDOMISED CONTROLLED TRIAL

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Introduction: The degree of knee flexion after total knee arthroplasty (TKA) is very important for daily activity living especially in Asian population. Many factors were correlated to achieve the high degree of flexion. Data are limited on the added benefits of immediate postoperative knee ROM photograph (IKP) as a motivation for encouragement the knee ROM after TKA. **Methods:** In prospective, randomized controlled trial of patients scheduled for unilateral primary TKA; Sixty patients were randomly assigned to receive IKP as motivation (30 patients, Group I) or weren't received IKP (30 patients, Group II). All patients were operated by single surgeon with the same operative technique, anesthetic method, and postoperative protocol. IKP were taken after wound closure and allocated to the patients in Group I at the day of surgery. Postoperative knee ROM, Knee Society Score (KSS) and functional score were recorded at day 3, 6 week, 3, 6, 12 and 24 month. **Results:** The patients in Group I had significant better knee flexion angle in the first 72 hours ($p=0.045$) and 6 week ($p=0.014$) after surgery, but not the knee extension angle. Group I had significant better mean KSS in 6 week ($p=0.019$), but not in KSS and functional score afterwards. **Conclusion:** IKP as motivation provided significant better knee flexion angle and KSS in first 6 week after surgery. Psychological motivation by IKP is one of the good alternative technique to expedite the postoperative ROM after TKA which easily apply to all of the patients.

Date: 2018-10-12

Session: Knee Free Papers (Total Knee Arthroplasty III)

Time: 16:00 - 17:30

Room: Room 519a+b

Abstract no.: 50101

COMPARISON OF FUNCTIONAL OUTCOMES FOLLOWING TOTAL KNEE ARTHROPLASTY WITH A CONVENTIONAL IMPLANT DESIGN OR ONE DESIGNED TO MIMIC NATURAL KNEE KINEMATICS

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Introduction: Up to 20% of patients are unsatisfied following total knee arthroplasty (TKA). One variable with the potential to influence satisfaction is the design of the TKA implant. The purpose of the current study was to compare functional outcomes following TKA in patients implanted with either a cruciate-retaining (CR) implant designed to mimic natural knee kinematics or a more conventional CR implant. Methods: Knee Society scores and WOMAC scores were assessed and compared at 3, 6, 12, and 24 months postoperatively. Two consecutive cohorts of TKA were compared. 52 patients underwent a kinematic CR TKA and 60 patients underwent a conventional CR TKA. Demographics, including age and body mass index, were similar between the groups. Results: The mean Knee Society Scores were significantly better for the kinematic group compared to the conventional group at 3 (69.5 vs. 63.0, $p=0.016$), 6 (84.4 vs. 70.1, $p=0.043$), 12 (93.0 vs. 86.1, $p<0.001$), and 24 (96.4 vs. 91.7, $p=0.006$) months. Similarly, WOMAC Scores were improved in the kinematic group compared to the conventional group at the 6 (17.8 vs. 24.6, $p=0.018$) and 12 (12.4 vs. 18.5, $p=0.008$) months. There was no difference between the groups for the other time intervals. Discussion: The results from the current study show that the kinematics of the implant play a role in patient reported outcomes. This, in turn, may improve patient satisfaction.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52725

**KEY NOTE LECTURE: FEMOROACETABULAR IMPINGEMENT: WHERE
THE EVIDENCE IS TAKING US**

Femi AYENI

, . (CANADA)

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 50971

ACHILLES TENDON CHARACTERISTICS IN THE ASYMPTOMATIC PATIENT: AN ULTRASOUND STUDY

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Achilles tendon rupture (ATR) generally occurs due to a sudden eccentric contracture of a degenerative tendon. However, most patients that sustain ATRs have no clinical symptoms prior to rupture. Therefore, many patients must have asymptomatic Achilles tendon degeneration. Ultrasound has been proven to accurately identify Achilles tendon morphology and pathology. The objective of this study was to define the prevalence of ultrasound-detected Achilles tendinopathy in asymptomatic patients in an at-risk group. This was a cross-sectional study that collected data from a group of volunteers at one point in time. All participants were given IPAQ questionnaires to gauge daily activity level, in addition to a basic demographic form. Participants underwent a brief physical examination, including height, weight, Silfverskiold test, and an ultrasound examination to evaluate for Achilles tendinopathy. 51 volunteers (30 female, 21 male) and 102 Achilles tendons were reviewed in this study. The mean age of this cohort was 27.4 ± 6.3 with an average BMI of 23.5 ± 3.9 . 92% of our participants were categorized as having Moderate or High activity levels. In the ultrasound examination portion, including a total of 102 Achilles tendons, 10 (9.8%) were classified as having some degree of tendinosis. Approximately 40% of patients were noted to have a gastroc equinus contracture on Silfverskiold testing. In this cross-sectional study approximately 10% of Achilles tendons in an at-risk group were noted to have some degree of degeneration. Asymptomatic Achilles tendinosis does appear to exist and can possibly explain why many patients that suffer ATRs are not symptomatic beforehand.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 50977

HOW DO SPORTS MEDICINE AND FOOT AND ANKLE SPECIALISTS TREAT ACUTE ACHILLES TENDON RUPTURES?

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Achilles tendon ruptures (ATRs) are common injuries treated by orthopaedic surgeons of different subspecialties. The treatment of ATRs has been a subject of some controversy. The purpose of this study was to evaluate the treatment considerations and surgical techniques utilized by sports medicine and foot/ankle specialists in the United States. An electronic survey was distributed to 2062 orthopaedic sports medicine surgeons and 1319 orthopaedic foot/ankle surgeons. Surgeons were asked to comment on the number of ATRs managed per year, as well as how they treat acute ATRs and their preferred operative technique. Eight clinical scenarios addressing age and activity level were presented to determine practices with regards to acute ATR and re-rupture. 537 (15.8%) responses were included for analysis. 8.5% of respondents manage more than 20 acute ATRs per year with the majority (75.4%) managing less than/equal to 10 per year. Operative management is the treatment of choice for 76.4% of total respondents with only 7.4% managing acute ruptures non-operatively. Activity level and patient age were the most important factors for 60.9% and 29.4% of surgeons in terms of decision-making. In the clinical case scenarios, the majority of surgeons elect to treat healthy and active 20, 30 and 50-year-old patients surgically. Open surgical treatment is the preferred method of management for acute ATRs amongst sports and foot/ankle fellowship-trained orthopaedic surgeons. Many surgeons treating ATRs in the United States manage these injuries relatively infrequently with most orthopaedic sports and foot/ankle surgeons electing to treat younger and healthier patients more aggressively.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 50736

MULTIPLE ILIOPSOAS TENDONS AND ITS IMPLICATIONS IN INTERNAL SNAPPING HIP SYNDROME

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Aims: This cadaveric study aims to describe the anatomical variations of the iliopsoas complex in 28 subjects, in an attempt to elucidate the mechanism of recurrence of internal snapping hip syndrome (ISHS) following surgical management through tenotomy. **Methods:** The iliopsoas complex was dissected unilaterally in 28 formalin-embalmed cadavers and the number and courses of the iliacus and psoas major tendons measured and determined. **Results:** The presence of single, double and triple tendon insertions of iliopsoas were found in 12, 12 and 4 of the 28 specimens respectively. The average length of the iliopsoas muscle from the mid-inguinal point to the lesser trochanter was 122.25 ± 12.96 mm. The merging of iliacus with psoas major occurred at an average distance of 24.89 ± 17.91 mm proximal to the mid inguinal point. In all cases, the lateral-most fibres of iliacus yielded a non-tendinous insertion on to the anterior, infratrochanteric region of the femur rather than joining onto the main iliopsoas tendon(s). Iliacus was found to be composed of two distinct muscle bulks in 53.57% of specimens. The average total width of the psoas major tendon decreased with an increasing number of tendons: 14.56 ± 2.17 mm (single tendon), 8.215 ± 2.95 mm (2 tendons present) and 5.88 ± 1.14 mm (3 tendons present). **Conclusion:** The results of this study suggest that multiple tendons are a potential cause of ISHS recurrence post-tenotomy. Complete release at the lesser trochanter ensures that all tendons will be incised, whilst preserving some iliopsoas function via the direct insertions of iliacus onto the anterior femoral shaft.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51445

OUTCOMES AFTER ARTHROSCOPIC SURGERY FOR FEMOROACETABULAR IMPINGEMENT WITH A GLOBAL PINCER: A SYSTEMATIC REVIEW

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Background: The purpose of this systematic review was to evaluate the clinical and radiological outcomes, and complications for arthroscopic management of global pincer-type femoroacetabular impingement (FAI). Methods: Three databases, PubMed, MEDLINE, and EMBASE, were searched from database inception until 2017 by two independent reviewers. The inclusion criteria were studies that investigated arthroscopic management of global pincer-type FAI, and reported clinical and radiographic outcomes. Study quality was assessed using the MINORS tool. Results: The search identified 3176 studies, of which 5 studies (101 patients; mean age, 35.0 years) were included for assessment. We found 1 case report, 2 case series, and 2 retrospective comparative studies, which had a level of evidence of IV, IV, and III, respectively. The most commonly reported outcome measures were the Modified Harris Hip Score (mHHS), and Non-Arthritic Hip Score (NAHS), which showed mean improvements of 53.9 to 80.7, and 50.5 to 79.1, respectively. In studies reporting radiologic outcomes using the lateral center-edge angle (LCEA), the mean pre-operative and post-operative values were 48.9° and 37.9°, respectively. There was a 9.3% conversion rate to total hip arthroplasty (THA) at a mean time of 13.1 months post-operatively (mean age of 40.9 years). Conclusions: Clinical improvement in patient-reported outcomes was found in a limited number of studies with short-term follow-up. Rapid conversion to THA was seen in a notable proportion of patients. While comparative studies reported clinical results inferior to focal pincer-type FAI, global pincer can be correctable with modern arthroscopic techniques.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 50857

THE USE OF SONOGRAPHY DURING PERCUTANEOUS ACHILLES TENDON REPAIR TO AVOID SURAL NERVE INJURY: A CASE SERIES

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Background: Percutaneous repair of the Achilles tendon has become an advocated technique for surgically treating ruptures, with functional outcomes comparable to open repair but with fewer wound complications. However, the incidence of sural nerve injury remains high and is the main drawback of this technique. Methods: Two patients with Achilles tendon ruptures underwent repair by the same surgeon in October and December of 2017. Each repair was carried out with the Arthrex Percutaneous Achilles Repair System (PARS) jig through a 3 cm skin incision about 1 cm proximal to the rupture site. Intraoperative ultrasound was used to ensure that the needle was at least 5 mm away from the sural nerve each time it passed through the lateral side of the tendon. With the foot in maximum plantarflexion, the tendon ends were re-approximated. The patients wore a short-leg cast in plantarflexion for the first two weeks, after which they switched to a walking boot with four heel-lift wedges weightbearing as tolerated. After removing one wedge per week, the patients were allowed to use normal footwear on the sixth postoperative week and progress passive stretching to normal dorsiflexion range. Results: There were no complaints pointing to sural nerve injury such as sensory disturbance or pain. Sonographic evaluation on the eighth postoperative week showed good findings of intratendinous vascularization, increased homogeneity, and good tendon excursion. Conclusion: With indirect and dynamic visualization provided by sonography, iatrogenic sural nerve injury can be eliminated without the need of exposure during percutaneous Achilles tendon repair.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 52068

OUTCOME EVALUATION OF MEDIAL PATELLOFEMORAL LIGAMENT RECONSTRUCTION USING PATELLAR DOUBLE TUNNEL TECHNIQUE IN RECURRENT PATELLAR DISLOCATION

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Objective: To evaluate the outcome of medial patellofemoral reconstruction using the patella double tunnel technique in patients with recurrent patellar dislocation. Methods: 24 patients between 2015 and 2017 underwent MPFL reconstruction using a semitendinosus graft creating two tunnels in the patella and a femoral tunnel at Nomura's point. The graft was looped through the patella and fixed to the femur using an interference screw. They were evaluated preoperatively for patella apprehension, patellar tilt, patellar maltracking, trochlear dysplasia, TT-TG distance and Kujala score. After a minimum follow up of 12 months they were again evaluated for patellar apprehension, patellar tilt, patellar maltracking, Kujala score. Radiographs taken post operatively were used to assess the femoral tunnel placement and correlated with the clinical outcomes. Results: None of the patients had a redislocation post operatively. The Kujala score improved from 63.16 preoperatively to 87.92 postoperatively. There was no statistically significant difference in the outcome between the patients where the femoral tunnel was anatomically placed (as described by Schottle) and where there was a deviation of the tunnel from the anatomical point (as measured by Squares method). However, all the tunnels were placed within a mean of 7.4 mm in the radius of the Schottle's point. Conclusion: MPFL reconstruction gives excellent results in patients with patellar instability.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51455

ATHLETES EXPERIENCE A HIGH RATE OF RETURN TO SPORT FOLLOWING HIP ARTHROSCOPY

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Purpose: The purpose of this systematic review was to evaluate the rate at which patients return to sport following arthroscopic hip surgery. **Methods:** The databases MEDLINE, EMBASE, and PubMed were searched by two reviewers, and titles, abstracts, and full-text articles screened in duplicate. English-language studies investigating hip arthroscopy with reported return to sport outcomes were included. A meta-analysis of proportions was used to combine the rate of return to sports using a random effects model. **Results:** Overall, 38 studies with 1773 patients (72% male), with a mean age of 27.6 years (range 11-65) and mean follow-up of 28.1 months (range 3-144) were included in this review. The pooled rate of return to sport was: 93% (95% confidence interval [CI]= 87% to 97%) at any level of participation; 82% (95% CI = 74% to 88%) at pre-operative level of sporting activity; 89% (95% CI = 84% to 93%) for competitive athletes; 95% (95% CI = 89% to 98%) in pediatric patients; and 94% (95% CI, 89.2% to 98.0%) in professional athletes. There was significant correlation between a shorter duration of preoperative symptoms and a higher rate of return to sports (Pearson correlation coefficient = -0.711, p=0.021). **Conclusion:** Hip arthroscopy yields a high rate of return to sport, in addition to marked improvement in pain and function in the majority of patients. The highest rates of return to sport were noted in pediatric patients, professional athletes, and those with a shorter duration of preoperative symptoms.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Miscellaneous)

Time: 08:00 - 10:00

Room: Room 520a+b

Abstract no.: 51538

RETURN TO WORK FOLLOWING HIP ARTHROSCOPY FOR FEMOROACETABULAR IMPINGEMENT

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Introduction: The adoption of hip arthroscopy continues to increase, yet no published evidence exists from which to advise patients regarding their potential for return to work, except in workers' compensation cases. Although physiotherapy is commenced immediately post-operatively, with no restrictions to range of movement, patients require time off from work to recuperate. We hypothesize that this will vary according to occupation. Methods: We analysed all cases performed between June 2015 and May 2017 by 2 specialist hip arthroscopy surgeons at a single NHS hospital, with a minimum of 6 months follow-up. Patient demographics, operative indication, and procedure performed were recorded. All patients received a booklet with a suggested rehabilitation protocol, plus weekly visits to a physiotherapist for the first six weeks were organised. We contacted all patients via postal questionnaire for their occupation and date of return to work. 3 groups were then formed, matched for age, sex, and BMI, according to their occupational exertional demands; physical, standing, and sedentary. None involved workers' compensation cases. Results: Full data was gained from 93 patients who had undergone hip arthroscopy for femoroacetabular impingement; 63 females and 30 males, average age 38, average BMI 24.8. Patients with a physical job returned to work at an average of 9.45 weeks (range 1-30, median 6), a standing job 7.12 weeks (0.5-26, 6), and a sedentary job 3.52 weeks (0.5-13, 3) ($p < 0.001$ difference physical to sedentary). Conclusions: Patients with a more physical job should expect to take longer to return to work.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51563

THE RELATION OF GRAFT TYPE AND ANTIBIOTIC PRE-SOAKING WITH DEEP INFECTION RATES IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A META-ANALYSIS OF 185 STUDIES WITH 53 526 CASES

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Introduction: Infection is a rare but devastating complication in anterior cruciate ligament reconstruction (ACLR). Pooling individual studies via meta-analysis can allow more meaningful evaluation of factors influencing infection rates. We aimed to determine the relationship between graft type and vancomycin graft pre-soaking with bacterial infection rates following ACLR. Methods: A systematic search was conducted on PubMed, Ovid Medline, EMBASE, and CENTRAL). Included studies were those reporting on primary arthroscopic ACLR using hamstring (HT) or bone-patella-tendon-bone (BPTB) autografts or allografts of any type, with reference to outcomes and complications, particularly deep infection or septic arthritis. Meta-analyses were performed to estimate the overall deep infection rates in ACLR surgery according to graft type and to examine the effect of vancomycin pre-soaking of grafts on infection rates. Results: We identified 258 bacterial infections in 53,526 grafts across 185 studies. The overall estimated ACLR graft infection rate in our meta-analysis was 0.9% (95% confidence interval (CI) 0.8% – 1.0%). HT autografts were associated with a higher infection rate (1.0%, CI 0.9% – 1.1%), than BPTB autografts (0.6%, CI 0.5% – 0.8%) and allografts (0.6 %, CI 0.5% – 0.8%) (Q=14.37, P=0.001). Pre-soaking HT autografts in vancomycin reduced infection rates to 0.1% (CI 0.0% - 0.3%) (Q=12.66, P<0.001). Conclusions: Deep infection following ACLR remains a rare but serious complication. HT autografts are associated with higher infection rates than other graft types. Pre-soaking HT autografts with vancomycin reduces infection rates by an estimated ten fold and we recommend this as routine practise in ACLR surgery.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51260

RESORPTION AND REMODELLING OF BIOABSORBABLE INTERFERENCE SCREW USED FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH HAMSTRING TECHNIQUE

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Fixation devices made of biological polymer composites incorporated with bioactive ceramics such as hydroxyapatite are widely replacing metal products in orthopedic sports medicine, but their rate of reabsorption is still debated. The aim of this prospective and randomized study was to evaluate the effective reabsorption and osseointegration of the poly-L-lactic acid with unsintered hydroxyapatite (PLLA-uHA) screw used in anterior cruciate ligament reconstruction with hamstring tendons through a clinical and radiological evaluation. Fifteen patients undergoing anterior cruciate ligament reconstruction with an hamstring tendons autograft fixed at the tibia with PLLA-uHA screw were evaluated at the same institution at a minimum of three years follow-up. Clinical evaluation was performed using objective and subjective forms. magnetic resonance was performed early after the operation within (Time 0), and after three years (Time 1). At Time 0, ACL graft integrity and tibial screw integrity were evaluated. The integrity of the screw has been documented as a strongly hypo-intense signal in all the acquired sequences. Clinical evaluation showed good and excellent results in all patients. MRI evaluation, at Time 0 ACL graft integrity and screw integrity were shown in every patient. At Time 1, all patients showed weak hyper-intensity in T1 sequences comparable with the intensity of the normal bone. No foreign body reactions were observed. The rate of screw reabsorption and osseointegration observed in this study seems to be higher than the one reported in previous studies that used similar interference screw fixation systems with unsintered PLLA-uHA.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51049

QUANTITATIVE COMPARISON OF MECHANORECEPTORS IN THE TIBIAL REMNANTS OF THE RUPTURED HUMAN ANTERIOR CRUCIATE LIGAMENT WITH DURATION OF INJURY AND ITS SIGNIFICANCE: AN IMMUNOHISTOCHEMISTRY-BASED OBSERVATIONAL STUDY

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BACKGROUND: Proprioception is a specialized sensory modality encompassing the movement of the joint and its position in space. Reconstruction of the ACL does not always yield expected outcome, suggesting that a successful reconstruction not only depends upon the ultimate strength of the graft but also on the recovery of proprioception. Treatment delay is a significant concern in developing countries such as Asia. Thus, presence of mechanoreceptors is one of the factors having paramount importance for successful outcome. We conducted this study to identify mechanoreceptors via immunohistochemical staining and correlated its presence with the duration of injury. **MATERIAL AND METHODS:** 38 injured native ACL stumps were harvested from patients undergoing ACL reconstruction. Stump was stained to detect functional mechanoreceptors (Neurofilament protein stain). **RESULT:** 44.7% of the specimen stained positive for the monoclonal antibody (NFP). No association was found between the duration of the injury and the presence of mechanoreceptors ($p = 0.897$). No correlation was seen between age, sex and the side. **CONCLUSION:** No correlation between the time of injury and presence of viable mechanoreceptors, hence it is beneficial to preserve the native ACL stump irrespective of the time interval between injury and surgery.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51849

COMPLICATION RATES OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION IN SKELETALLY IMMATURE PATIENTS WITH NEW INSTRUMENTATION: A SINGLE-CENTRE STUDY

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Background: Pediatric anterior cruciate ligament reconstructions have increased during the last decade. Conservative treatment of these injuries is associated with a poor outcome because of subsequent meniscal and chondral injury risks. The optimal surgical technique is still controversial. The main objective of this study was to evaluate the security of the physeal-sparing reconstruction techniques performed with a new instrumentation. The secondary objective was to assess the complications associated with the PEEK screw system used for femoral fixation. Methods: All patients who underwent all-epiphyseal ACL reconstruction surgery between March 2015 and January 2017 were included in this retrospective study. The all-epiphyseal ACL reconstruction procedures were done using a new instrumentation system that use a titanium tibial anchor fixation and a femoral PEEK implant. All complications were retrieved from the hospital databases and follow up radiographs, including subsequent injuries and surgical procedures. Femoral and tibial bone tunnels were measured on postoperative lateral and AP knee radiographs. Results: Seventeen arthroscopic ACL reconstruction patients were included. At a mean follow-up of 10.4 months, there were no symptomatic growth abnormalities requiring intervention, but 2 unilateral early physeal closures, one new increased unilateral varus and 3 limb length discrepancies between 1 and 2 cm. Asymptomatic, but significant tunnel widening was observed in 5 knees. Conclusion/Significance: The all-epiphyseal hamstring autograft ACL reconstruction demonstrate no clinically significant complication. The use of a femoral PEEK implant was associated to almost 30% of femoral tunnels widening with no negative clinical impact recorded so far.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 51358

OUTCOME OF ECCENTRIC GRAFT POSITIONING IN THE TIBIAL TUNNEL BY INTERFERENCE SCREW APERTURE FIXATION IN SINGLE-BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH QUADRUPLE HAMSTRING GRAFT

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Introduction: Anatomic ACL reconstruction remains incomprehensible because complex anatomy. Aim of graft fixation for provides excellent stability by restoring normal anatomy. However the goal of anatomic tibia fixation with interference screw aperture techniques can be use uniform the graft that can reproduce native ACL insertions by posterolateral placement for hypothesis eccentric interference screw placement techniques have evolved in effort to increase graft obliquity by shift the graft to the anterior. Method: MRI from 46 patients with reconstructed ACL graft and from 46 patients with an intact ACL between January 2009 and December 2017. Postoperative ACL-R MRI studies were obtained from patients and evaluated to assess placement of bio screw, continuity, and appearance of the graft. Result: In comparison to normal control with native ACL more vertical both in sagittal and coronal planes in compare with reconstructed group. Intact native ACL sagittal obliquity averaged 47.7° and coronal plane obliquity averaged 64.6° . And reconstructed patients sagittal obliquity averaged 53.3° (42° -72°) and coronal plane average obliquity was 67.20 (53o -890). With subgroup analysis anterior group and posterior group placement of the bio screw result in different graft obliquity. Posterior group give more obliquity in 10.2 o between 8.6o and 12.40. Conclusion: Position of interference screw aperture fixation in posterior position will increase graft more obliquity than anterior position.

Date: 2018-10-12

Session: Sports Medicine Free Papers (Ligament II)

Time: 16:00 - 17:30

Room: Room 520a+b

Abstract no.: 50554

RISK FACTORS OF ACL INJURY: ANATOMICAL LOWER LIMB ALIGNMENT IN ACL DEFICIENT VERSUS ACL INTACT KNEES - A CASE CONTROL STUDY

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Evaluation of risk factors both modifiable and non-modifiable may help to design neuromuscular training programs or prevention strategies in preventing Anterior cruciate ligament (ACL) injuries. In this prospective case control study we compared various anatomic lower limb parameters in ACL intact versus ACL deficient knees using radiography in Indian population. 50 patients (15 - 40 years) diagnosed with ACL tear were taken as Cases & 50 normal individuals matched by age, sex, height and weight were taken as Controls. We measured: Mechanical Axis (MA) deviation from vertical axis, Tibiofemoral angle (TFA), Hip-Neck-Shaft angle (HNS) on scanogram; Posterior Tibial Slope (PTS) on standard lateral view & Notch Width Index (NWI) on tunnel knee radiograph. We compared injured with uninjured side of cases and injured side of cases with dominant side of controls. Injured & uninjured knees of cases were not significantly different in terms of MA deviation from vertical axis (3.34 vs 3.21° , $p=0.478$), TFA (5.2° vs 5.7° , $p=0.33$), PTA (13.15° vs 13.36° , $p=0.735$), HNS (128.61° vs 127.26° , $p=0.81$) & NWI (0.26 v. 0.27 , $p=0.40$). ACL-deficient and ACL-intact knees were comparable but not significant in terms of MA deviation from vertical axis (3.34° vs 3.36° , $p=0.886$), TFA (5.28° vs 6.32° , $p=0.324$ and HNS angle (128.61° vs. 129.67° , $p=0.272$. PTS (13.15° vs. 10.87° , $p=0.001$) was significantly larger and NWI (0.30 vs. 0.32 , $p=0.014$) significantly smaller in ACL-deficient than ACL-intact knees. We suggest that higher PTS and narrow NWI can be regarded as anatomic intrinsic risk factors for ACL injury.

Date: 2018-10-12
Session: Spine Free Papers (III)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 49769

IS HALO GRAVITY TRACTION A PANACEA IN SEVERE RIGID SPINAL DEFORMITIES?: A PROSPECTIVE ANALYSIS OF 26 PATIENTS

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Introduction: Acute correction of rigid spinal deformities are often fraught with complications. Halo Gravity Traction (HGT) has been claimed, to be beneficial in such scenarios. Methods: Patients with primary curve $>120^\circ$ and $<20\%$ flexibility, underwent preoperative HGT. Radio-graphic parameters analyzed were Cobb angles of curves- major scoliosis (MSCA), compensatory (CSCA- 1 & 2) & kyphosis (MKCA), Flexibility index, Costo Iliac impingement (CILD) and Shoulder height difference (SHD). Pulmonary function was also assessed. Results: (14 males, 12 females) with mean age of 18.5 ± 8.7 years were studied. The mean weight & height gained were 3.64 ± 1.22 kg & 4.38 ± 1.26 cm respectively. The correction efficacy of HGT in MSCA, CSCA-1 & CSCA-2 were 15.55, 13.31 & 18.67% respectively. MKCA improved from $83.33 \pm 33.94^\circ$ to $66.08 \pm 34.07^\circ$. There was an improvement from 0.8 to 2.52 cm in CILD. The Coronal Imbalance (CI) & Truncal Shift (TS) improved from 2.61 & 3.22 to 2.4 & 2.08 cm respectively. Mean SHD improved by 0.9 cm. Mean FVC improved from 43.32 ± 1.13 to $48.46 \pm 6.01\%$ and FEV1 from 37.12 ± 6.91 to $41.81 \pm 6.86\%$. There were no instances of neurological worsening or failure of instrumentation. Conclusion: HGT, safely and effectively increases the flexibility of major curves as well as compensatory curves in severe rigid spinal deformities. It improves the overall balance of the patient by reducing the TS, CI and SHD. It also provides adequate time to optimize the patient for major surgical undertaking and minimizes complications.

Date: 2018-10-12

Session: Spine Free Papers (III)

Time: 08:00 - 10:00

Room: Room 520c

Abstract no.: 51479

IS CHRONIC KIDNEY DISEASE ASSOCIATED WITH POSTOPERATIVE COMPLICATIONS AFTER SPINAL FUSION SURGERY?

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Introduction: Chronic kidney disease (CKD) patients may be at increased complication risk after spine surgery. We compared (1) complications (medical and surgical); (2) length of stay (LOS); and (3) re-operations between CKD and non-CKD patients. Methods: A retrospective review of the New York State Statewide Planning and Research Cooperative System (SPARCS), a prospectively collected database, was conducted. Patients who underwent 2-3-level spinal fusion from 2009-2013 with minimum 2-year follow-up were identified. Patients were grouped into CKD and non-CKD and propensity-matched (1:1) for age, sex, race, and Charlson/Deyo score. 1,644 patients were included (CKD: n= 822; non-CKD: n= 822). Hospital LOS, total charges, complications, and re-operations were compared between CKD and non-CKD. Multivariate logistic regression identified factors independently associated with complications. Results: Regression analysis revealed CKD patients had 400% increased odds of postoperative medical complications compared to non-CKD (OR= 4.30, p<0.001). Medical complications were independently associated with older age and black race (OR= 1.015, p=0.003; OR=1.377, p=0.049 respectively); female sex was protective (OR= 0.803, p=0.039). Charlson/Deyo score was not associated with increased complications (p=0.197). The odds of surgical complications were not significantly different (p=0.136). The CKD cohort had a longer LOS (5.07 vs. 4.13, p=0.003), with no significant differences in re-operations between CKD and No-CKD (15.5 vs. 18.6%; p=0.88). Conclusion: Patients with CKD who underwent spinal fusion exhibited increased odds of postoperative medical complications. There was no significant difference in re-operation rates. This is the first study to analyze postoperative complication rates in CKD patients undergoing spinal fusion with 2-year follow-up.

Date: 2018-10-12
Session: Spine Free Papers (III)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 52162

RESTORATION OF NORMAL PELVIC BALANCE FROM SURGICAL REDUCTION OF HIGH-GRADE SPONDYLOLISTHESIS

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Introduction: It has been proposed that reduction can improve sagittal balance but the evidence supporting this concept remains limited. The objective of this study is to assess the impact of surgical reduction on pelvic balance in relationship with quality of life (QoL) in high-grade spondylolisthesis. Methods: We reviewed 53 patients aged 14.1+-3.3 years who underwent surgery for high-grade spondylolisthesis were followed for a minimum of 2 years. Patients with a residual high-grade slip following surgery were referred to the in-situ group, while patients with a residual low-grade slip were referred to the reduction group. Pelvic balance was assessed from pelvic tilt (PT) and sacral slope (SS), in order to identify patients with a balanced pelvis (high SS and low PT) or unbalanced pelvis (high PT and low SS). The SRS-22 questionnaire was completed for all patients before surgery and at last follow up. Results: There were 14 patients in the in-situ group and 39 patients in the reduction group. Four patients in the in-situ group and 16 patients in the reduction group with a preoperative balanced pelvis maintained a balanced pelvis postoperatively. None of the patients in the in-situ group and 9 patients in the reduction group improved from an unbalanced pelvis preoperatively to a balanced pelvis postoperatively. Moreover, there is a clear tendency for better QoL improvement in patients with balanced pelvis postoperatively. Conclusion: Surgical reduction of high to a low-grade slip is more effective in maintaining and restoring a normal pelvic balance postoperatively, and improving QoL.

Date: 2018-10-12

Session: Spine Free Papers (III)

Time: 08:00 - 10:00

Room: Room 520c

Abstract no.: 51938

SURGEON DIRECTED NEUROMONITORING IN PAEDIATRIC SPINAL DEFORMITY CORRECTION: SAFE AND COST EFFECTIVE

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Introduction: Intraoperative neuromonitoring is essential for safe spinal deformity correction. We present our results of surgeon managed and monitored deformity corrections and their outcome. Methods: 142 children underwent scoliosis correction using surgeon directed monitoring of Transcranial Motor Evoked Potentials (TcMEP) (2012-2017). The mean age was 13.9 years (5-17 years) and the M:F=28:114. Data was collected prospectively. The outcome of surgery and intra operative events were recorded. Results: We included 120 cases of adolescent idiopathic scoliosis, 9 syndromic scoliosis, 9 neuromuscular scoliosis, 2 Scheuermann's kyphosis and 2 high-grade lumbar spondylolisthesis. Mean duration of neuromonitoring was 302.5 minutes (SD 105.7 minutes) with average 20 stimulations in each case. Because of wide variation in MEP amplitudes, it was not possible to set a significant threshold drop of EMG amplitude unlike SSEP. Three cases (2.11%) had complete visual loss of lower limb MEP signal that did not resolve with restimulation, anaesthetic stabilization, or reversal of surgical manoeuvre. These cases had staged correction following axial scanning to check screw position and exclude haematoma. No case with neurological dysfunction upon waking was recorded. Discussion: Surgeon directed neuromonitoring leads to reduce reliance on other staff, and reduces personnel required in the operating room whilst not adding to operating time. We have used this technique safely for deformity corrections in the last 5 years and found this to be reliable and safe with no false negative results. Conclusion: Surgeon directed MEP systems could be a safe alternative to traditional intraoperative neurophysiologist directed neuromonitoring in children undergoing deformity correction.

Date: 2018-10-12
Session: Spine Free Papers (III)
Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51435

INTRAOPERATIVE TRACTION IN SCOLIOSIS CASES: A SAFE AND AN EFFECTIVE TOOL TO ACHIEVE BETTER CORRECTION

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Introduction: We believe that intraoperative skull-femoral traction (IOT) may effectively assist with spinal deformity correction. The aim of this study is to find out the effects of IOT in single-stage posterior arthrodesis on perioperative outcomes compared to control group without IOT. **Methodology:** A retrospective cohort study of scoliosis patients operated on at our center from the period from 2010. Inclusion criteria were Cobb's angle > 50°, single stage posterior spinal instrumented fusion, follow-up >6 months. Growth-friendly surgeries were excluded. Group-A consisted of patients where IOT was not used while group-B had IOT. Flexibility index, correction index, operative time, complication rates, blood loss, were compared between the two groups with t-test and chi-square test where applicable. **Results:** Group-A consisted of 52 patients with mean follow-up of 2.11years (range 6mths to 6.6yrs) and group-B had 30 patients with mean follow-up of 2.5years (range 9mths to 6.3yrs). We found that the correction index was 11.1% more (p-value <0.05) in group-B compared to group-A. Mean blood loss and operative time were 647 ml and 6.04 hours in group-A, while 662 ml and 7.14 hours in group-B, respectively. Operative time was significantly more in group-B. There was no statistical difference between the two groups in terms of flexibility index, complication rates, and blood loss. Neurophysiological changes were not seen in the traction group. **Conclusion:** We found the use of IOT to be a safe and an effective tool to achieve better correction without an increase in complication rates, operative time, and blood loss.

Date: 2018-10-12
Session: Spine Free Papers (III)
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Room: Room 520c

Abstract no.: 49450

SPINAL GROWTH TETHERING AROUND THE APICAL VERTEBRAE LEADS TO ASYMMETRIC GROWTH AS A MECHANISM OF SPINAL DEFORMITY CORRECTION IN KYPHOSIS AND SCOLIOSIS

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Introduction: a non-fusion method aims to create growth in the apical vertebrae that results in gradual deformity correction and prevents crankshaft. This method utilises a posterior approach around the peaked wedged vertebrae in early onset scoliosis . Methods: retrospective review of the x-rays and 3D CT scans of 17 EOS patients. Patients underwent posterior tethering proximal and distal to the peak of the deformity as an adjunct to distraction-based growth-friendly, or Shilla implants. The rate of change was calculated for the wedged apical vertebrae at the concave and convex heights in scoliosis and kyphosis. The control group had the same parameters measured for the vertebrae outside the tethering effect. Cobb angle and spinal height were also measured. Results: mean follow-up time: 50.8 months. Mean age at surgery: 61 months. For wedged vertebrae within the tether, average preoperative concave/convex height ratio was 0.55, while average last follow-up ratio was 0.76 ($p < 0.005$). For the control vertebrae outside the tether, average preoperative concave/convex height ratio was 0.80, while average last follow-up ratio was 0.82 ($p = 0.064$). Average preoperative scoliosis Cobb angle was 51° , and became 43.8° at the last follow-up ($p = 0.057$). Average preoperative kyphosis Cobb angle was 56.1° and became 21.5° at last follow-up ($p < 0.005$). Preoperatives spine length was 250.1 mm, and at last follow-up became 292.27 mm ($p < 0.005$). Conclusion: posterior tethering in EOS will asymmetrically modulate the apical vertebrae, correcting the deformity with the non-fusion technique.

Date: 2018-10-12
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Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 51996

THE IMPACT OF SURGICAL REDUCTION OF HIGH GRADE SPONDYLOLISTHESIS ON PROXIMAL FEMORAL ANGLE AND QUALITY OF LIFE

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Introduction: Abnormal PFA was recently found to be associated with deteriorating sagittal balance and QoL in HGS. However, the influence of PFA on the QoL of patients undergoing surgery remains unknown. Methods: Thirty-three patients (mean age 15.6±3.0 years) operated for L5-S1 HGS between 2002-2016; 13 had in situ fusion and 20 had reduction. The minimum follow-up was 2 years. PFA, pelvic incidence, pelvic tilt(PT), sacral slope(SS), lumbosacral angle(LSA), slip percentage(slip%), as well as QoL using SRS-30 were compared pre- and postoperatively. Statistical analysis used non-parametric Mann-Whitney and Wilcoxon Signed Rank tests and bivariate correlations with Pearson's coefficients. Results: After reduction, there was a decrease in PFA (7.6°±6.5 to 2.5°±4.5, p=0.002), slip% (77%±17 to 29%±19, p<10⁻³), and an increase SS (44.5°±10.2 to 49.5°±8.9, p=0.026) and LSA (78.8°±21.3 to 96.2°±14.4, p<10⁻³). The change in PFA correlated positively with the change in PT (R=0.67, p=10⁻³) and negatively with the change in SS (R=-0.54, p=0.015). In parallel, a negative correlation was found between change in PFA and change in pain score (R=-0.50, p=0.024). In contrast, in situ fusion did not alter PFA. Patients with normal preoperative PFA had similar QoL regardless of the type of surgery, except for body image, which correlated positively with reduction (R=0.55, p=0.011). Patients with abnormal preoperative PFA tended to have a higher QoL in all domains after reduction. Conclusion: Decreasing postoperative PFA correlates with less pain. Reduction of HGS decreases PFA; it also relates to a better QoL when the preoperative PFA is abnormal.

Date: 2018-10-12
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Abstract no.: 52555

IDIOPATHIC ESCOLIOSIS OF ADOLESCENTS AND SIMILAR: A NEW PRINCIPLE - SHORT, APICAL, SINGLE OR MULTIPLE

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Objective: To create a new instrumentation principle in the treatment of Adolescent Idiopathic Scoliosis (AIS) and similar deformities, with short, apical, single or multiple fixations. **Methods:** A new treatment principle of AIS and similar was created, which establishes for structured scoliosis: One curve, one fixation, two curves, two fixations, and three curves, three fixations. To evaluate the new method, a retrospective study of 54 patients already submitted to surgery for AIS and similar deformities with this innovation was carried out. **Results:** In this series, a mean correction in the proximal curve of 72%, correction of 83% in the mean thoracic curve and 85% in the thoracolumbar curve was found. **Conclusion:** It was concluded that the new instrumentation principle presented excellent correction, better still in the more distal section of the curves, in relation to the spine. There is statistically significant difference between the percentages of correction of curvatures between the pre and postoperative periods.

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Room: Room 520c

Abstract no.: 52550

ONE STAGE OR TWO?: A COHORT ANALYSIS OF ANTEROPOSTERIOR SPINAL FUSIONS FOR SEVERE PAEDIATRIC SCOLIOSIS

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Introduction: Patients with severe pediatric spine deformity may require combined anterior-posterior fusion procedures. Given their increased complexity and morbidity, surgeons may consider staging these procedures on separate days. However, the decision to perform one-stage (single surgical episode) and two-stage (separate days) anterior-posterior fusion procedures is controversial. We sought to identify the differences in morbidity, complications, and deformity correction between one-stage and two-stage anterior-posterior spinal fusion surgeries for severe pediatric scoliosis. Methods: A retrospective cohort study was performed on a prospectively collected Pediatric Spine Database. Patients under the age of 21 with pediatric scoliosis who underwent primary anterior-posterior spinal deformity correction surgery either through a one-stage or planned two-stage sequence with greater than 2-year follow-up were included. Differences in demographics, co-morbidities, surgical details, peri-operative morbidity, complications, and outcomes were assessed. Results: There were 113 patients with one-stage fusions and 22 patients with two-stage fusions. Average follow-up was 90.1±54.7 months. There was no difference in scoliosis etiology (idiopathic vs. non-idiopathic, p=0.227). The two-stage surgery cohort had longer anterior (278.7±90.6 vs. 212.9±67.8 minutes, p<0.001) and posterior surgical time (408.7±118.2 vs. 329.8±88.2 minutes, p=0.006), received more blood transfusion (1196.1±882.3cc vs. 732.2±621.5cc, p=0.004), and had longer hospital stays (14.6±8.2 days vs. 6.6±5.3, p<0.001). There was no difference in post-operative complications or final deformity correction achieved. Conclusions: Two-stage anterior-posterior surgery for severe pediatric spinal deformity patients was associated with increased morbidity, longer surgical times, increased transfusions, and longer hospital length of stay, without significant difference in post-operative complications or deformity correction compared to one-stage surgery.

Date: 2018-10-12
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Room: Room 520c

Abstract no.: 52435

TEN KEY STEPS FOR RADIOGRAPHIC ANALYSIS OF ADULT DEGENERATIVE SCOLIOSIS

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Introduction: Adult scoliosis is defined as coronal or sagittal plane deformity in skeletally mature. Described as a Cobb angle more than 10° on AP plane without history of scoliosis. Degenerative scoliosis is most common type of adult spinal deformity that clinicians encounter in an acute hospital or outpatient settings. With ageing population, rapid increase in ADS prevalence. Hence there is desperate need for simple radiographic evaluation system to assess the same. It is quiet concerning how most clinicians unable to identify, evaluate and quantify it radiologically which has detrimental effect in assessment of severity and quantifying the urgency and need for referral to tertiary care. All variables have shown improvement in patient reported outcome when corrected, consistently in recent literature. Method: We create a system that contain 10 key steps to evaluate ADS radiologically. The included parameters already had key role in management planning. We subdivided the radiographic evaluation in three main headings. A – Global Evaluation that includes Sagittal Vertical Axis and Central Sacral Vertical Line. B – Regional Evaluation that looks into Thoracic Kyphosis, Lumbar lordosis and Cobb Angle. C – Focal Assessment that incorporated spino-pelvic parameters like Pelvic incidence, Sacral Slope, Sacral Tilt, Degree of degenerative listhesis or lateral slippage and Fractional Curve. Conclusion: Creating a system whereby clinicians seeing these patients simply follow the 10 Key steps to evaluate ADS radiographically. They can subsequently communicate to complex degenerative deformity correction team at tertiary care in effective and clear way facilitating further management.

Date: 2018-10-12
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Time: 08:00 - 10:00
Room: Room 520c

Abstract no.: 50997

THE RIB CONSTRUCT: A SAFE AND EFFECTIVE METHOD FOR CORRECTION OF SEVERE PAEDIATRIC SPINAL DEFORMITY

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Hyperkyphosis, osteoporosis, neuromuscular(NM) and syndromic etiologies are associated with increased blood loss and/or complications for deformity surgery. **Materials and Methods:** 6 early onset syndromic or NM kyphoscoliosis; 3 congenital; 12 later onset syndromic or NM deformity. Comorbidities: osteoporosis (18, 3 not tested), congenital heart disease (3), developmental delay (19). Average operating time 283 mins; average EBL 262 without fusion (12), 1072 with fusion (9,3 prior fusion) 18 had > 5-year follow-up or died (6) of unrelated causes, 3 had >2 year follow-up. **Results:** Syndromic scoliosis 80.6° preop to 55.5° postop. Thoracic kyphosis (TK) 105.6° to 64°. Thoracolumbar (TL) kyphosis 50° to 13°. Rigid congenital kyphosis 64.5° to 19°. NM/syndromic w/o prior fusion scoliosis 114.6° to 60.6°, TK 92.5° to 59.5, global kyphosis 117.3° to 39°; with prior fusion TK 117.3° to 89°, scoliosis 88° to 58°. 3 with prior fusion had > 30° PJK, chin brow angle from 39.6° to 13°. **Complications (24):** 2 pulmonary, 18 instrumentation complications, 2 deep wound infections, 2 pseudarthrosis, 1 wound dehiscence. No PJK, no change in evoked potentials, or permanent sequelae of complications. **Discussion:** Directly manipulating the thorax gives better intraoperative assessment of trunk and shoulder balance, and the superior purchase of rib fixation affords the surgeon greater flexibility, especially in medically fragile patients. The RC eliminates PJK as a complication and improves downward gaze in those with pre-existing PJK. The RC can be safely placed without CT imaging, and is thus applicable for developing countries without sophisticated imaging and/or monitoring.

Date: 2018-10-12

Session: Spine Free Papers (III)

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Room: Room 520c

Abstract no.: 52731

**KEYNOTE LECTURE: FUTURE PERSPECTIVES OF THE FULL
ENDOSCOPY APPROACHES TO TREAT SPINAL PATHOLOGIES**

Marcio RAMALHO

, . (BRAZIL)

Date: 2018-10-12
Session: Spine Free Papers (IV)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 51669

COMPARING PREDICTORS OF COMPLICATIONS FOLLOWING ANTERIOR CERVICAL DISCECTOMY AND FUSION, TOTAL DISC REPLACEMENT AND COMBINED ACDF-TDR WITH MINIMUM TWO-YEAR FOLLOW-UP

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Introduction: Factors that predict risk of developing complications following ACDF and TDR are under-reported, with limited existing data. We studied how complications varied among ACDF, TDR, and combined ACDF-TDR as well as what variables significantly impacted development of postoperative complications. Methods: NY Statewide Planning and Research Cooperative System was used to identify all patients who underwent ACDF or TDR from 2009-2011 with minimum two-year follow-up (n=20,487), and three cohorts were formed: ACDF, TDR, or ACDF-TDR. Demographics, hospital-related parameters, mortality, and postoperative outcomes were collected. Multivariate logistic regression models identified independent predictors of outcomes. Results: 19,808 underwent ACDF, 449 underwent TDR, and 230 underwent ACDF-TDR. Compared to ACDF and ACDF-TDR, TDR had the youngest cohort and lowest total hospital charges (p<0.002). No differences were found with length of stay, race, gender, and mortality rate. ACDF-TDR patients had the highest cardiac complication and pulmonary embolism rates, while TDR had highest individual surgical complication rates and complication rates related to device, internal fixation, and prosthesis. ACDF-TDR patients experienced the lowest revision rates of revision (all p<0.05). TDR was associated with increased odds of any surgical complications (OR=1.9/p=0.03). Black race was found to predict any medical and total complications (OR=1.5/1.3). Female gender was associated with increased odds of readmission (OR=1.2) but was the only significant protective factor against readmission (OR=0.9) (all p≤0.004). Conclusion: TDR patients were younger, had lowest hospital charges, yet experienced higher surgical complication and revision rates. This large-cohort study provides evidence to better individualize and optimize procedure choice for each patient.

Date: 2018-10-12
Session: Spine Free Papers (IV)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 50632

MAGNETIC RESONANCE IMAGE FINDINGS OF THE SUTURE FAILURE OF THE NUCHAL LIGAMENT IN THE EARLY POSTOPERATIVE PERIOD AFTER CERVICAL LAMINOPLASTY

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Introduction: Post-operative separation of the nuchal ligament may be one of the causes of cervical kyphosis and paravertebral muscle atrophy. We examined the suture failure of nuchal ligament by MRI obtained within a week after cervical laminoplasty. Methods: This study was conducted with 87 patients (70 men and 17 women; mean age, 68.9 years) who underwent open-door cervical laminoplasty on 4 or more laminae. At whatever level we performed laminoplasty, we resected the spinous processes at the same level. We used O-vicryl® for the closure of nuchal ligament. Suture failure of nuchal ligament and the presence of hematoma in the spinal canal, subcutaneous layer and distribution range of hematoma were assessed by MRI. Suture failure was determined to have occurred if T2-weighted axial MRI showed any tear in the nuchal ligament. Results: As a result of this study, the suture failure of the nuchal ligament was confirmed in 72 cases (46 cases for 1 vertebra and 26 cases for 2 or more vertebrae). Subcutaneous hematoma was confirmed in the caudal side more than in the cranial side. Spinal canal hematoma was confirmed in 86 cases. Conclusion: It is liable to become a dead space when resecting the spinous processes by laminoplasty. We currently knot the nuchal ligament three times with O-vicryl®. However, our research indicates a suture failure of 82%. This suggests either strong thread or an increased number of stitches in closer proximity, or an increase in the number of knots may be required.

Date: 2018-10-12

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Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 51421

OUTCOMES OF PATIENTS WITH PARKINSON'S DISEASE UNDERGOING CERVICAL SPINE SURGERY FOR RADICULOPATHY AND MYELOPATHY WITH MINIMUM TWO-YEAR FOLLOW-UP

Sarah STROUD¹, Neil SHAH², John KELLY³, Jared NEWMAN¹, Daniel MURRAY¹, Joshua LAVIAN¹, George BEYER¹, Qais NAZIRI¹, Omar HARIRI¹, Louis DAY¹, Peter PASSIAS⁴, Frank SCHWAB⁵, Virginie LAFAGE⁵, Carl PAULINO¹, Bassel DIEBO¹

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Introduction: This study compared the: (1) demographics; (2) complications; (3) length of stay (LOS); (4) hospital charges; (5) reoperations; and (6) readmissions following cervical spine surgery (CSS) between Parkinson Disease (PD) and non-PD patients. Methods: All elective CSS from 2009-2011 were identified retrospectively. Demographics, comorbidities, and 2-year postoperative complication, reoperation, and readmission rates were collected. CSS patients with PD were propensity-matched with non-PD patients. These groups were compared with univariate analysis. Regression models identified predictors of 2-year outcomes. Results: 134 CSS patients were included (67 PD and 67 non-PD). PD patients were less commonly white (74.6 vs 91.0%, $p=0.024$); all other demographics were comparable. PD patients had significantly greater LOS (7.3 vs 3.6day, $p=0.004$) and hospital charges (\$77,439.13 vs \$45,761.24, $p=0.008$) compared to non-PD patients. Overall (41.8 vs 40.3%, $p=0.861$), medical (38.8 vs 31.3%, $p=0.365$) and surgical (11.9 vs 11.9%, $p=1$) complication rates were comparable, as were rates of reoperation (14.9 vs 13.4, $p=0.804$) and readmission (85.1 vs 74.6%, $p=0.132$). PD patients demonstrated higher rates of altered mental status (6.0 vs 0%, $p=0.042$) than non-PD patients. Regression analysis revealed that Deyo index was the sole significant predictor of higher 2-year complication (OR1.936, $p<0.001$) and readmission (OR 5.377, $p=0.001$) rates. PD was not a significant predictor of 2-year complication (OR 1.107, $p=0.804$), reoperation (OR 1.459, $p=0.464$), or readmission (OR 2.234, $p=0.123$) rates. Conclusion: This study found comparable rates of adverse outcomes at 2 years after CSS between PD and non-PD patients; PD was not a significant predictor for any adverse.

Date: 2018-10-12
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Room: Room 520c

Abstract no.: 50913

CLINICAL OUTCOME OF LAMINOPLASTY FOR CERVICAL OSSIFICATION OF THE POSTERIOR LONGITUDINAL LIGAMENT

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Introduction: This study aimed to evaluate the clinical outcome cervical ossification of the posterior longitudinal ligament (OPLL) that underwent laminoplasty. Patients and method: 37 patients (31 males, 6 females) of the cervical OPLL that underwent open door laminoplasty were evaluated. The average age was 66 years old (39-82). The type of OPLL was continuous type; 21 patients, segmental type; 10 patients, mixed type; 3 patients, localized type; 3 patients. The average occupied ossification rate was 48.4%, the average anterior-posterior diameter of space available for the spinal cord was 5.6 mm, the average number of enlarged laminae was 5.1, and the average follow-up period was 4.1 years. We investigated about clinical result, cervical alignment and range of motion (ROM) were compare before and after operation and progression of ossification after operation were measured on CT. Results: The Japanese Orthopaedic Association(JOA) score were improved in all patients after operation (from 10.0 to 12.7) and the improvement rate were 38.1%. The cervical spine lordosis was decreased slightly (from 11.8 ° to 9.0 °). The average cervical spine ROM was decreased(from 30.8°to 22.5 °). The average progression ossification of OPLL was 22.4 mm (length) and 0.97 mm (thickness). Conclusion: Cervical lordosis and cervical ROM were decreased after laminoplasty for OPLL. Although JOA score was improved, OPLL progressed after operation.

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Room: Room 520c

Abstract no.: 50608

FUSION RATE FOR ONE AND TWO LEVELS ANTERIOR CERVICAL DECOMPRESSION AND INTERBODY FUSION

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Introduction: Aim was to compare the fusion rate of anterior cervical decompression and fusion (ACDF) with stand-alone tricortical iliac crest auto graft verses stand-alone PEEK cage. Material and methods: Prospectively collected data of 60 patients in each group was compared. Results: Among the 94 patients who underwent single level non-instrumented ACDF only 4 (4.25%) had psuedoarthrosis. The fusion rate for single level ACDF in our series was 95.74%. Among the 25 patients operated for two level non-instrumented ACDF ,6 patients (24.00%) had pseudoarthrosis. The fusion rate for two levels ACDF in our series is 76.00%. There was no significant difference in fusion rates of the PEEK cage when compared to auto graft group. Both the groups showed better fusion for single level ACDF. Both the groups showed graft subsidence and loss of segmental lordosis on follow up X rays. The mean loss of segmental lordosis on follows up X-ray for auto graft group was ($5.89^{\circ} \pm 2.90^{\circ}$) which was significantly higher ($1.88^{\circ} \pm 2.77^{\circ}$) than the mean loss seen in PEEK cage group ($P = 0.01$). Cage subsidence and loss of segmental lordosis was most obvious in auto graft group between six months and one year. Conclusion: Fusion rates in ACDF are independent of interbody graft material. Fusion rates for single level ACDF is significantly higher than two levels ACDF.

Date: 2018-10-12

Session: Spine Free Papers (IV)

Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 51030

NEUROMONITORING SIGNAL CHANGES IN CERVICAL SPINE SURGERY: WHEN IS IT SIGNIFICANT?

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Introduction: Modern cervical spine surgeries utilises intraoperative neuromonitoring (IONM) in the form of Motor Evoked Potential (MEP), Somatosensory Evoked Potential (SSEP) and Electromyography (EMG). With a wide range of sensitivity and specificity, there is a need to differentiate between true and false positive signal changes. Methods: A retrospective review of IONM and clinical records of cervical spine surgeries in 3 hospitals between 2013 and 2017. Multimodal IONM was used in all cases. Clinical and IONM records (MEP and SSEP) were analysed. Results were grouped into 3 groups. In Group 0, there were transient unimodal signal drops. In Group 1, there were sustained unimodal signal drops while in Group 2, there were sustained drops in both the MEP and SSEP. Results: 257 cases were reviewed and 207 cases were analysed after exclusions. A total of 52/207 (25.1%) cases had IONM changes. 10/207 (4.3%) of cases were in Group 0, while Group 1 had 35/207 (16.9%) of cases. 7/207 (3.4%) of cases were in Group 2. Patients in Group 0 and 1 had no neurological deficits, while in Group 2, 2/7 (28.6%) had neurological deficits. Both MEP and SSEP were 100% sensitive. SSEP had a specificity of 96.6%, while MEP had a lower specificity of 76.6%. Conclusion: Our study shows that by grouping the signal changes into transient or sustained, and unimodal or bimodal, we are better able to predict which signal drops are significant, thereby allowing for improved intraoperative decision making.

Date: 2018-10-12

Session: Spine Free Papers (IV)

Time: 16:00 - 17:30

Room: Room 520c

Abstract no.: 51790

A NOVEL ANTERIOR DECOMPRESSION SURGERY FOR THE TREATMENT OF CERVICAL OSSIFICATION OF POSTERIOR LONGITUDINAL LIGAMENT

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Introduction: The basic principle of surgical treatment of cervical ossification of posterior longitudinal ligament (COPLL) is to achieve decompression of the spinal cord. There are still many controversies in regard to the surgical strategy when the COPLL is severe. This report describes a novel decompression surgery named anterior controllable antidisplacement and fusion (ACAF) for the treatment of severe COPLL. Methods: 20 patients with severe COPLL were enrolled. All the patients underwent ACAF. The main surgical procedures include discectomy of the involved levels, thinning of the anterior part of the involved vertebrae, bilateral osteotomies of the vertebrae, and antedisplacement of the vertebrae-OPLL complex. Clinical outcomes based on Japanese Orthopaedic Association (JOA), visual analog scale (VAS) pain score, and Odom's scale. The pre- and postoperative radiological parameter, and surgical complications were also recorded. Results: The mean follow-up time for all the patients was 10 months, ranging from 6 to 12 months. Mean JOA and VAS scores showed statistical improvements in the postoperative period. Five patients had mild dysphagia after operation. According to Odom's scale, 6 patients had excellent outcomes, 12 patients had good outcomes, and 2 patients had fair outcomes at 6-month follow-up. Postoperative CT and MRI showed complete decompression of the cord by antedisplacement of the vertebrae-OPLL complex. Conclusions: This study demonstrates that excellent outcome can be achieved with the use of the ACAF. Though further study is required to confirm the conclusion, this novel technique has the potential to serve as an alternative surgical technique for the treatment of COPLL.

Date: 2018-10-12
Session: Spine Free Papers (IV)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 49770

A PROSPECTIVE RANDOMISED STUDY TO ANALYSE THE EFFICACY OF BALANCED PREEMPTIVE ANALGESIA IN SPINE SURGERY

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Introduction: Spine surgeries are known to cause moderate to severe acute postoperative pain. Inadequate management results in higher morbidity and chronic pain due to central sensitization. The role of preemptive analgesia has gained importance recently. Methods: 100 patients requiring lumbar fusion procedures were randomized into Preemptive analgesia (PA) and control (C) groups. The PA group received paracetamol (P), ketorolac (K) and pregabalin (PR) preemptively. Both underwent identical anesthetic and postoperative pain management protocol. Demographic and surgical data, four hourly pain levels - Numeric Pain Rating scale (NRS), Ramsay sedation scale (RSS), opioids consumption (TOC) through patient controlled analgesia (PCA), functional levels-Oswestry Disability Index (ODI), North American Spine Society Satisfaction (NASS) scale, and hospital stay were recorded. Results: The average NRS score within the first 48 hour period in PA group (2.7 ± 0.79) was significantly less than the C group (3.4 ± 0.98). Ambulatory scores were also significantly low in PA group. The PA group had significantly low TOC (3.02 ± 2.29 mg) in comparison to the C group (4.94 ± 3.08 mg). The duration of hospital stay were 4.17 ± 1.02 and 4.84 ± 1.62 days in the PA and C groups ($p=0.017$). PA group (97.90 %) were extremely satisfactory compared to C group (72%, $p=0.002$) according to NASS scale. Conclusion: Postoperative pain is unique, as it is a combination of nociceptive, inflammatory and neuronal stimuli. Blockage of all three stimuli by preoperative administration of balanced analgesia with paracetamol, ketorolac and pregabalin, resulted in lesser pain intensity, better ambulation tolerance, improved functional outcomes, reduced requirement of opioids and duration of hospital stay.

Date: 2018-10-12
Session: Spine Free Papers (IV)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 52413

THE ANTERIOR-POSTERIOR-ANTERIOR APPROACH: AN EFFECTIVE SURGICAL TECHNIQUE TO TREAT NEGLECTED FACET DISLOCATIONS OF THE SUB-AXIAL CERVICAL SPINE

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Bilateral fracture dislocation of facet joint is a distractive flexion injury of stage 3 or stage 4 according to the classification of Allen et al. We have analyzed the difficulties encountered during delayed surgical management (more than 3 weeks) of sub-axial cervical facet dislocations with or without neurological deficit with the aim of proposing a surgical strategy for the same. This is a retrospective review of twenty-two patients (12 males, 10 females) with a mean age of 37+/-3.5 years, who presented to us with neglected bifacetal dislocations of the sub-axial cervical spine. Fall from height was the most common mode of injury. Following failed closed reduction open reduction was carried out as a three-stage procedure under a single anaesthesia (Stage 1:anterior cervical discectomy through Smith Robinson approach, Stage 2: release of fibrous tissues around the facets or facetectomy to reduce the locked facets and posterior stabilization Stage 3: anterior reconstruction with bone graft and locking plate through Smith Robinson approach.The mean follow up period was 27.2+/-5.4 months. Sixteen patients had complete pain relief at last follow up. There were no complications like dislodgement of graft or graft resorption. The spinal alignment was well maintained in all cases at final follow-up. There was no neurological deterioration in any patient. One patient who had suboptimal reduction reported pull out of screws during the follow up period but with satisfactory maintenance of spinal alignment. The less traumatic approach is an effective option in the management of neglected bifacetal dislocations of sub-axial spine.

Date: 2018-10-12
Session: Spine Free Papers (IV)
Time: 16:00 - 17:30
Room: Room 520c

Abstract no.: 52406

TORTICOLLIS IN AN EIGHT-YEAR-OLD CHILD DUE TO GRISELS SYNDROME AND REVIEW OF LITERATURE

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INTRODUCTION: Torticollis due to Grisel's syndrome is an unusual condition that could be fatal. A review of the literature is presented regarding diagnosis and treatment. **METHODS:** 8 year old with acute history of tonsillitis consulted to the emergency department post a trivial fall. **RESULTS:** Physical examination showed a fixed head or limitation of movement to neutral position and initially a normal neurological examination. Initial cervical X-ray was not diagnostic. The final diagnosis was made by CT scan and MRI. Patient was treated with anti-inflammatory medication, immobilization with cervical traction. **CONCLUSION:** Grisel's syndrome is a non-traumatic atlanto-axial rotatory fixation (AARF) with or without subluxation following infection or surgery in the head or neck region. This paper presents an unusual cause of torticollis that could be fatal or cause neurological injury if not recognized and treated appropriately.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52723

KEY NOTE LECTURE: BOYDS INTERVAL: THE GATEWAY TO THE ELBOW

Lee VAN RENSBURG

, . (UNITED KINGDOM)

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52097

COMPARING SURGICAL REPAIR TO CONSERVATIVE TREATMENT AND SUBACROMIAL DECOMPRESSION FOR THE TREATMENT OF ROTATOR CUFF TEARS: A META-ANALYSIS OF RANDOMISED TRIALS

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Introduction: Rotator cuff tears are a common cause of shoulder pain and reduced function, with a high prevalence reported in older patients. The purpose of this study was to compare the effectiveness of surgical repair to conservative treatment and subacromial decompression for the treatment of rotator cuff tears, by performing a meta-analysis of randomized trials. Methods: PubMed, Cochrane database, and Medline were searched for randomized controlled trials comparing surgical repair to conservative treatment or subacromial decompression alone, published until March 2018. Results: Five studies were included in this review. A meta-analysis of the Constant Murley Score (CMS) one year following intervention showed that surgical repair resulted in significantly improved scores compared with conservative treatment (mean difference = 6.15; 95% CI, 2.24 to 10.07; P=0.0020). A meta-analysis of the CMS one year post-operatively also showed that surgical repair yielded significantly improved scores as compared to subacromial decompression (mean difference = 5.38; 95% CI, 1.92 to 8.84; P= 0.002). In the conservatively treated group, 11.9% of patients crossed over to surgical repair following unsatisfactory results. Conclusions: The results of this review showed that surgical repair results in significantly improved outcomes when compared to either conservative treatment or subacromial decompression alone for degenerative rotator cuff tears in older patients. However, the magnitude of the difference in outcomes between surgery and conservative treatment may be small and the "success rate" of conservative treatment may be high, allowing surgeons to be judicious in choosing those patients who are likely to benefit the most from surgery.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 51546

LONG-TERM OUTCOME IN REVERSE SHOULDER ARTHROPLASTY REGARDING AETIOLOGIES

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Introduction: The aim of the study was to prove long-term results of reverse shoulder arthroplasty (RSA) regarding various etiologies, such as primary or secondary fractures or cuff tear arthropathies (CTA). As hypothesis was defined that secondary fracture prostheses are functionally inferior to primary care. Methods: Hundred (n=100) RSA patients between 2010 and 2016 were matched and included (ø 73 years, ø follow-up 32 months) with same prosthesis design. The functional outcome was evaluated using Constant Score (CSa), Quick DASH (QD) and Subjective Shoulder Value (SSV). Results: In primary fracture prostheses collective (group I.a, n=35) a revision was required due to dislocation (n = 1, 2.8%). In the secondary group of fracture prostheses (group I.b, n=22), a postoperative nerve lesion occurred (n = 1, 4.5%). Mean scores of fracture prosthesis groups: CSa: 73 (Ia) vs. 65 (Ib) {p = 0.130}, QD: 22 (Ia) vs. 28 (Ib) {p = 0.255}, SSV: 72% (Ia) vs. 67% (Ib) {p = 0,249}. Due to two dislocations and one infection, the CTA collective (group II, n = 43) had three revisions (n = 3, 6.9%). Mean results of fracture vs. CTA: CSa: 70 (Ia + b) vs. 82 (II) {p = 0.001}, QD: 24 (Ia + b) vs. 14 (II) {p = 0.001}, SSV: 70% (Ia + b) vs. 79% (II) {p = 0.008}. Conclusion: RSA has a low complication rate as a slightly range in clinical outcome. Good long-term functional results and high patient satisfaction could be demonstrated.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 49698

EFFECTIVENESS OF PLAIN SHOULDER RADIOGRAPH IN DETECTING DEGENERATE ROTATOR CUFF TEARS

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Background: Plain radiographs are the most easily attainable first-line investigations in evaluating shoulder injuries. This study determines the effectiveness in predicting degenerate rotator cuff tears by detecting radiographic changes on shoulder X-rays. Methods: Retrospective cross-sectional study with a consecutive series of patients conducted in Hinchingbrooke Hospital, Huntingdon, United Kingdom from January 2015 to June 2017. Anteroposterior shoulder radiographs of 150 symptomatic patients who underwent shoulder arthroscopy were independently analyzed by surgeons who were blinded from the arthroscopic results. Patients with advanced osteoarthritis and cuff tear arthropathy evident on X-rays were also excluded. Sixty five patients included in the study had rotator cuff tears on arthroscopy. Radiographic changes were correlated with arthroscopic findings to determine this test's ability to predict degenerate rotator cuff tears. Results: When both cortical irregularity and sclerosis were present on the plain radiograph, these signs had a sensitivity of 78.8% [95% CI 65.7, 87.8%] and specificity 77.4% [95% CI 67.2, 85.0%] with a positive predictive value of 68.3%, using contingency table analysis. The presence of cortical irregularity was found to be a better predictor of a tear as compared to sclerosis. Conclusions: This study concludes that plain radiograph are good modality for initial evaluation of rotator cuff tears and detecting when both cortical irregularity and sclerosis. Consideration of these radiographic findings serves as a useful adjunct in diagnostic workup and can guide subsequent investigations and treatment when evaluating rotator cuff tears of the shoulder.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52581

A PROSPECTIVE RANDOMISED STUDY COMPARING ULTRASOUND GUIDED TARGETED HIGH VOLUME INJECTION OF THE ROTATOR CUFF INTERVAL AND SUPERVISED PHYSICAL THERAPY FOR PRIMARY ADHESIVE CAPSULITIS OF SHOULDER AT A TERTIARY CARE CENTRE

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BACKGROUND: HVI (High volume injection) is a promising treatment option for severe adhesive capsulitis, for faster rehabilitation. We present a single center, single blinded, matched parallel randomized control trial(RCT) comparing ultrasound-guided HVI through rotator cuff interval followed by supervised physical therapy, versus supervised physical therapy alone for severe primary adhesive capsulitis of shoulder joint. **METHODS:** 40 patients were randomized in to two groups: Group-A(n=20) underwent supervised physiotherapy in addition to HVI, and Group-B(n=20) underwent supervised physiotherapy in isolation. A blinded researcher carried out assessments at 0,3 & 6months. The primary outcome measure was shoulder range of motion(ROM), especially external rotation. In addition UCLA score, VAS score, cuff strength, failure rates and return to pre-disease activity levels were assessed. **RESULTS:** Group-A fared better in all parameters at 2 weeks and 3 months, but by 6 months the outcome results of both the groups were similar. In Group-A, the external rotation improved significantly from 4.5degrees(-30to20) at baseline to 43.25degrees(15to80; P<0.05) at 3months and 51.25degrees(15to85) at 6 months; which were 6.25degrees(-20to25), 36.75degrees(15to60) and 47.5degrees(15to80) respectively in Group-B. Group-A had statistically significant improvement in UCLA score (p<0.05) compared to Group-B at 3 months, but which were almost similar by 6 months. In both the groups, all the outcome measures improved significantly from baseline to 6 months (p<0.05). **CONCLUSION:** In conclusion, HVI is distinct from hydrodilatation and patients who underwent HVI had rapid pain relief with earlier regaining of movements and earlier returning to their pre-disease activity levels.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52502

THE RELATIONSHIP BETWEEN ACROMIOCLAVICULAR JOINT ARTHRITIS AND CRITICAL SHOULDER ANGLE

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We studied the shoulder radiographs to identify any relationship between critical shoulder angle (CSA) and acromioclavicular joint (ACJ) osteoarthritis. 295 shoulder radiographs were studied. We excluded fractures, fracture dislocations, children below the age of 16 years and post-op x-rays. There were 79 cases for final review. Three reviewers measured the critical shoulder angle on AP radiograph of shoulder. All the radiographs were then reviewed by a consultant radiologist. The data were then analysed to see if there was a relationship between the critical shoulder angle and osteoarthritis of the ACJ. Two tailed T-test was used to assess the difference between smaller and larger angles for the presence or absence of osteoarthritis. Analysis of variance (ANOVA) was used to compare the grades of OA with the angles. There were 38 males and 41 females. The average critical shoulder angle was 40 degrees with range of 24 - 54 degrees. Osteoarthritis of the acromioclavicular joint was present in 36 (45.6%) cases. There was a statistically significant difference (T-test, $p=0.002$) in the incidence of ACJ OA among the group with the smaller critical angle (higher incidence) compared to those with larger critical angles. Also, when comparing the grades of OA and the angles there was a statistically significant difference (ANOVA, $p=0.005$), with more severe OA in patients with smaller critical angles. The results indicate that there may be a positive association between osteoarthritis of acromioclavicular joint and smaller shoulder critical angles both in terms of presence and severity of OA.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52422

ARTHROSCOPIC ANATOMIC CORACO- AND ACROMIOCLAVICULAR LIGAMENT RECONSTRUCTION FOR HIGH GRADE ACROMIOCLAVICULAR JOINT INJURIES: CLINICAL, RADIOLOGICAL AND SONOGRAPHIC OUTCOMES

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Introduction: We analyzed our clinical, radiological and sonographic outcome results with arthroscopic anatomic coraco- and acromio-clavicular ligament reconstruction (ACCR) by autologous semitendinosus tendon graft, using a novel technique. **Methods:** 24 consecutive patients (19 males and 5 females), mean age 42.02 years (range 23 - 65 years), with Rockwood Type III-V AC Joint injuries, who underwent arthroscopic ACCR using autologous semitendinosus tendon graft, were evaluated retrospectively for their pre-operative clinical & radiological data and prospectively for clinical, radiological & sonographic outcomes (Institutional Ethics Committee approval No: IHR_2017_SEP_AB_241). The evaluation tools included VAS score for pain, UCLA & ASES scores for shoulder function and standard comparative radiological and sonographic evaluation measurements. **Results:** The mean follow up was of 37.85 months (range, 24.23-60.97 months). All outcome scores at a minimum of 2 years after surgery showed significant improvement ($p < 0.05$ in all comparisons with the pre-op scores using paired t-test). The post-operative comparative radiograph was identical in 13(54.17%), satisfactory in 7(29.17%), and un-satisfactory in 4(16.67%) cases in the AP, axillary or both the views, which correlated well with the sonographic measurements. One patient (4.2%) had a repeat injury necessitating revision surgery. The radiological and sonographic appearances had no impact on the clinical outcomes. **Conclusions:** This novel technique is a relatively simple, minimally invasive, anatomic alternative to a complex shoulder procedure, while sparing the coracoid process from drilling, with no need of any surgical implants, recreating a native-like ligament reconstruction, and also providing the surgeon the freedom to convert easily to an open procedure if needed.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52212

**COMPLICATIONS AUDIT AND CLINICAL OUTCOMES OF
ARTHROSCOPIC LATARJET WITH LABRAL REPAIR**

Kenneth CUTBUSH

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This study investigates the complications of arthroscopic Latarjet stabilisation with labral repair for shoulder instability. 104 arthroscopic Latarjets were performed between December 2011 to January 2018. A prospective analysis of 93 procedures in 91 patients was undertaken over a of 24-month period following surgery. The mean age of the patients was 29 years (SD=8). 49% of operations were performed on the dominant side. Patients were assessed clinically and radiologically. Pain was evaluated using a visual analogue scale (VAS). Shoulder instability and quality of life were measured using the Oxford Shoulder Instability Score (OSIS), Western Ontario Shoulder Instability Index (WOSI) and QuickDASH. Active range of movement was also examined. Results revealed a 17% decrease in pain with normal activities at 24-months following surgery. An improvement was also observed in the OSIS, WOSI and QuickDash, with scores decreasing by 35%, 43% and 15% respectively, indicating progressive shoulder stability and quality of life improvement over time. A comparison of ROMs demonstrated a mean increase of 15° in forward flexions from 149° (SD=27) to 164° (SD=16). 19% of cases experienced either minor or major complications. The most common complications were graft-related (6%); followed by hardware failures and nerve abnormalities (both 3%); then infection and loss of external rotation (both 2%). No patient experienced a dislocation following surgery. Of the last 40 procedures, 2 graft related complications occurred requiring revision surgery; an overly lateral bone block position and avulsion of the bone block due to patient physical exertion 2 weeks post-operatively.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 50649

RISK OF NEUROVASCULAR INJURY RELATED TO DISTANCE FROM CORACOID PROCESS IN VARIOUS PATIENT POSITIONS: A CADAVERIC STUDY

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Prince of Songkla university, Hatyai (THAILAND)

This study proposed the safe distance around the coracoid process to avoid neurovascular injury during surgery. The experiment was conducted in twenty-four fresh-frozen cadavers. Twelve right shoulders and twelve left shoulders were dissected to measure the distance from anteromedial aspect of the coracoid base and the coracoid tip to the lateral border of neurovascular structures in horizontal, vertical, and closest plane. The neurovascular structures at risk includes the axillary nerve, the musculocutaneous nerve, the lateral cord, and the axillary artery. The measurements were performed in supine position, lateral decubitus position, and beach chair position. In the beach chair position, we evaluated five arm postures including the arm at side, 45-degree abduction, 90-degree abduction, 45-degree forward flexion and 90-degree forward flexion. In the results, the shortest distance from the anteromedial aspect of the coracoid tip to the lateral border of the neurovascular structures was found in the beach chair position with 90-degree arm abduction. The distances in horizontal, vertical and closest plane were 26.56 6.88 mm, 19.16 4.3 mm, and 17.11 4.8 mm, respectively. Similarly, the shortest distance measured from the coracoid base was found in the posture of 90-degree arm abduction with 25.89 4.99, 20.76 3.72mm and 18.41 3.56 mm in the horizontal, vertical and closest plane respectively. In conclusion, any procedures around the coracoid process are relatively safe from neurovascular injury. However, the surgeons should be concerned of the possible neurovascular complications while approaching the coracoid especially in the beach chair position with arm in an abducted position.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52344

ULTRASONOGRAPHIC AXILLARY NERVE MAPPING: AN ALTERNATIVE COST-EFFECTIVE TOOL WITH IMPLICATIONS IN SURGERY

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Aim: To identify the course of the axillary nerve and its distance from the shoulder joint. We also wanted to ensure this was a reproducible technique that could be taught to radiologists, radiographers and potentially surgeons as a pre-operative measure to avoid injury to the axillary nerve. **Method:** Over 50 patients were recruited in this prospective study. Patients were randomly assigned to ultrasonographic studies of their shoulder by a radiologist with a specialist interest in musculoskeletal imaging. Patients were referred via their general practitioner and the orthopaedic department with symptoms suggestive of shoulder pathology. Exclusion criteria included patients over 60 years of age. Ultrasound scans were performed with identification of the axillary nerve and its course from the quadrangular space with measurements taken from the humeral head. Results were tabulated and the process was repeated. **Results:** All patients recruited in the study underwent scans where the axillary nerve was identified in its course with the posterior circumflex humeral artery approximately 4cm from the humeral head. **Conclusion:** We propose that ultrasonographic mapping of the axillary nerve is both cost-effective and can be performed with relative ease. This has major implications in surgery whereby the nerve is often at risk. Injury to this can cause devastating consequences to a patient's function. This study offers instructions and guidance in mapping the axillary nerve with the growing use of ultrasonography as an alternative to costly, time-consuming alternatives such as magnetic resonance imaging.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (I)

Time: 08:00 - 10:00

Room: Room 521a+b+c

Abstract no.: 52480

MIS (SPLIT DELTOID) APPROACH FOR FIXATION OF THREE- AND FOUR-PART PROXIMAL HUMERUS FRACTURES: SAFE AND EFFECTIVE

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Introduction: 3- and 4-part fractures of the proximal humerus need good rotator cuff (in addition to open reduction and internal fixation (ORIF)) to obtain good clinical results. The split deltoid approach is minimally invasive (MI) and provides excellent access to the rotator cuff. We present results of our series of 48 proximal humeral fractures operated through the MI split deltoid approach, the advantages and concerns. Methods: 48 consecutive patients (mean age, 38 years) with 3- or 4-part proximal humerus fractures presenting to us between Nov 2011 & Oct 2017 were operated using the split deltoid approach and fixed using proximal humerus locking plates. Fractures of the humeral head were excluded. Rotator cuff sutures were routinely taken and tied to the plate. Clinicoradiological follow up was recorded regularly and assessed. Results: All but 2 fractures united at a mean of 3.5 months (range, 2-5months). At 3 months, average range of motion achieved was 100° of flexion, 90° of abduction & 30° of internal & external rotation; which improved to 120° of flexion, 110° of abduction & 40° of internal & external rotation at 12 months. Our complications included superficial infection (1), implant cutout (1), varus collapse (2), deltoid atrophy following axillary nerve injury (1), and greater tuberosity escape (3) leading to poor results. Discussion: Early ROM & return to near-normal function are possible following the minimally invasive split deltoid approach for 3- and 4-part fractures. Restoration of biomechanics of the tuberosities (greater and lesser) is critical.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (II)

Time: 16:00 - 17:30

Room: Room 521a+b+c

Abstract no.: 51427

IS IT NECESSARY TO LOCATE THE AXILLARY NERVE IN THE SURGICAL EXPOSURE DURING PRIMARY ANATOMICAL OR REVERSE TOTAL SHOULDER ARTHROPLASTY?

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Background: During primary shoulder arthroplasty, it has been suggested by many that to prevent injury to the axillary nerve the surgeon should either palpate the axillary nerve, directly visualize the nerve or use the “tug test.” Objective: The hypothesis of this study is that neither direct palpation of the axillary nerve, direct visualization of the nerve nor use of the “tug test” are necessary for prevention of axillary nerve injury in primary TSA or RTSA. Methods: In all patients undergoing primary TSA and RTSA performed by one surgeon between 2003 and 2017, none had direct visualization, palpation or use of a tug test to protect the axillary nerve. The primary outcome was the presence of an isolated clinically evident axillary nerve injury within 3 months of the arthroplasty date. Patients with axillary nerve injuries had a minimum follow-up of 12 months after the diagnosis of the injury. Results: 882 primary shoulder arthroplasties (342 TSA and 530 RTSA) were performed during the study period. 3 patients with less than 3 months of follow were excluded. There were 6 patients with an isolated axillary nerve injury with an incidence of 0.7%, with a rate in TSA of 0.3% and in RTSA a rate of 0.9%. All the patients with axillary nerve injury experienced complete neurologic recovery at last follow-up. Conclusions: This study suggests that direct visualization, direct palpation or use of the “tug test” for finding the axillary nerve is not necessary when performing primary TSA or RTSA.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (II)

Time: 16:00 - 17:30

Room: Room 521a+b+c

Abstract no.: 51666

NOVEL OUTCOME PREDICTORS FOR REVERSE SHOULDER ARTHROPLASTY

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Introduction: Critical shoulder angle (CSA) is the epitome of predicting outcomes for shoulder cuff arthropathies. The principles behind the reverse shoulder arthroplasty is to medialize and inferiorise the center of rotation. Methodology: 20 consecutive reverse shoulder arthroplasties with a minimal follow-up of 24 months were assessed with Constant scores, UCLA scores and oxford scores pre-operatively and post-operatively at 6, 12 and 24 months. Radiological distances were measured digitally in the antero-posterior plane of the roentgenograms of the shoulder. A right angled triangle was drawn with its hypotenuse (z) running from the center of the humeral head to the tip of the acromion with the apex pointing inferiorly. The bases were named as vertical (y) and horizontal as (x). The center edge angle (CEA) was measured as the angle between a vertical line drawn from the center of the humeral head and the hypotenuse. X,y,z and CEA measurements were correlated with post-operative clinical outcomes scores. Results: All the clinical scores improved with a statistical significance of $p < 0.0001$. Constant scores from 21.1 to 56.5, UCLA scores from 11 to 26.4 and Oxford scores from 39.3 to 20.6. The correlation between the significant measurements and clinical outcomes are as follows. X: Oxford scores ($r=0.562$), y: Constant scores ($r=0.475$), z: Constant scores ($r=0.444$), CEA: Constant scores ($r=0.455$) and CEA: Oxford scores ($r=0.481$). Conclusion :X,y,z as well as the CEA measurements could be used with great effect to predict the clinical outcomes of reverse shoulder arthroplasty.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (II)

Time: 16:00 - 17:30

Room: Room 521a+b+c

Abstract no.: 50973

SALVAGE OF THE RADIAL HEAD IN CHRONIC ADULT MONTEGGIA FRACTURES

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Adult patients with chronic adult Monteggia fractures present with severe disability. While salvage of the radial head has been widely described in young children, this has been seldom addressed in adults. Seven patients who were adults or nearing skeletal maturity presented to the senior author from December 2005 to November 2017. Their ages ranged from 14 to 37. There were 5 males and 2 females. They presented 5 months to 18 years after injury. Two had been treated by earlier surgery and five by local bone setters. The patients presented with anterior elbow pain, decreased flexion at the elbow and instability. All patients were primarily treated with open reduction of the radial head through a Boyd's approach and ulnar angulation osteotomy. Five patients required an additional radial shortening osteotomy. The patients were assessed by the junior author at an average follow-up of 4.5 years for clinical union, range of movement, radiological relocation and functional outcome assessed with the Liverpool Elbow Score(LES). All patients had union at the osteotomy site and congruent reduction of the radial head. All had more than 110° of flexion, absence of pain and near full supination. Three patients had notable reduction of pronation. However, this appeared to be compensated by the absence of pain and stability at the elbow. The average LES was 8.2. Radial head relocation in adults aided by ulnar angulation and if required, radial shortening osteotomy appears to result in a good outcome, even when there is longstanding dislocation.

Date: 2018-10-12

Session: Shoulder and Elbow Free Papers (II)

Time: 16:00 - 17:30

Room: Room 521a+b+c

Abstract no.: 50933

CLINICAL AND RADIOGRAPHIC EVALUATION OF REVERSE SHOULDER ARTHROPLASTY WITH A POLYETHYLENE GLENOSPHERE: MEAN FOLLOW-UP OF FIVE YEARS

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Introduction: Reverse shoulder arthroplasty (RSA) is a reasonable treatment modality in patients with Cuff Tear Arthroplasty and massive irreparable cuff tears, it has been shown to increase patient function and decrease pain. The aim of this study is to evaluate the clinical and radiographic results of a RSA with a polyethylene glenosphere. Methods: Since 2007 we selected 40 patients with cuff tear arthroplasty and irreparable massive cuff tear, in which we used an implant with polyethylene glenosphere and metal humeral insert with a mean FU of 5 years (range 36-110 months). Size of the glenosphere used were 40 and 44. All patients were assessed with the Constant score and with VAS. The shoulder ROM was measured preoperatively and postoperatively. Results: Average age of the patients was 73 years old at time of surgery. All measures improved significantly ($p < 0.0001$). The mean Constant improved from 15.6 to 60.2. VAS improved from 6 to 2,5. Forward flexion increased from 40 ° to 126,4 °, abduction from 41 ° to 103 °, external rotation from 15.1 to 17.3 and internal rotation increased by two level. We report 11 cases of scapular notching without clinical influence and without implant mobilization. Conclusion: This is the first report of the use of a polyethylene glenosphere with a five years follow up. Data from this study suggest that RSA with a polyethylene glenosphere may be a viable treatment for patients with glenohumeral arthritis and a massive rotator cuff tear.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52699

**KEY NOTE LECTURE: ACETABULAR FRACTURES IN THE ELDERLY:
THE DILEMMA - REPAIR OR REPLACE?**

Jamal ASHRAF

, . (INDIA)

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52430

HAS THE MOLECULAR ERA ARRIVED? IS IT TIME FOR MOLECULAR IDENTIFICATION OF BACTERIA BY 16S RRNA BBFISH® TECHNOLOGY IN SONICATION FLUID FOR THE DIAGNOSIS OF PROSTHETIC JOINT INFECTIONS?

Rares Mircea BIRLUTIU¹, Victoria BIRLUTIU², Razvan Silviu CISMASIU³, Crina Maria POPA⁴, Mihai Dan ROMAN⁵, Radu FLEACA⁵, Manuela MIHALACHE¹

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Introduction: By 2030, the annual number of combined total hip and knee arthroplasty is estimated to reach 3.5-4 million in the US alone. In the context of a constant increase of the number surgeries, an increased risk of complication is expected (both prosthetic joint infection and aseptic loosening). Methods: Until November 2017, 40 patients (40 retrieved implants) were enrolled in the study. Sonication fluid (SF) was collected after sonication of the implants, and samples were harvested on aerobic and anaerobic culture media. A bbFISH kit (hemoFISH® Masterpanel, Miacom diagnostics GmbH Düsseldorf, Germany), was used as a rapid method of bacteria detection. Results: 16 patients were diagnosed with PJIs. Comparing bbFISH with culture, 11 samples tested true-positive. The sensitivity of SF culture was significantly higher than that for intraoperative tissue culture and preoperatively synovial fluid (100%, 43%, and 18%, respectively). The sensitivity of the molecular identification of bacteria by 16S rRNA bbFISH® technology was 68.75% (as an overall sensitivity), but is analyzing the sensitivity strictly by the bacterial agents that could be identified by the used kit, the sensitivity will be 100%. Conclusion: Bacteria culture of SF remains the gold standard. bbFISH holds promise to be a diagnostic tool for rapid identifying of PJIs. With further improvement of the performance, bbFISH has the potential to complement conventional cultures. The assay needs to be optimized for the detection of bacterial strains that are relevant for the PJIs field like *Cutibacterium* (formerly *Propionibacterium*) *acnes* and why not *Ralstonia pickettii* or *Pseudomonas* spp.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51076

ECONOMIC IMPACT OF AN ANTIBACTERIAL HYDROGEL COATING IN PRIMARY JOINT ARTHROPLASTY: A MARKOV EXPECTED UTILITY ANALYSIS

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Little is known about cost-effectiveness of technologies that provide local antibacterial protection of implanted biomaterials in case of a widespread adoption to prevent postsurgical infection in orthopaedics. This study models the use of an antibacterial hydrogel coating (DAC®, Defensive Antibacterial Coating) in primary total hip or knee arthroplasty, to determine whether the use of this device is cost-effective, when compared with implants without coating. We used a Markov decision model to tabulate costs and quality-adjusted life years (QALYs) accumulated over time. Infection revision rates were used to determine the probability of undergoing a revision arthroplasty because of infection or infection recurrence. Other relevant data, such as medical costs, utilities and mortality rates, were estimated from the arthroplasty literature or from in-hospital resource. The analysis shows that DAC reduces cumulated costs by 45% and increases effectiveness, in terms of QALYs, by 5.1%. The cost of one additional QALY with DAC is equal to €1,581.94, 47% less than the unitary cost obtained without DAC. In a population with a 2.0% revision rate, DAC is a dominant strategy that generates significant savings, amounting to € 7,905.34, for each patient undergoing a primary TJA. Last, the coating is already cost-effective in a population of patients undergoing primary hip or knee replacement with an expected incidence of infection, without the coating, of 0.5%.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51857

AETIOLOGY AND ANTIMICROBIAL SUSCEPTIBILITY OF SURGICAL SITE INFECTIONS AT MOI TEACHING AND REFERRAL HOSPITAL, ELDORET, KENYA

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Background: Surgical Site Infection (SSI) increases cost, hospital stay and causes significant morbidity and mortality. The incidence of SSI in sub-Saharan Africa is approximately 10% and 60% for clean wounds and dirty wounds respectively. We determined bacterial etiology and antimicrobial susceptibility of surgical site infections at Moi Teaching and Referral Hospital, Eldoret, Kenya. Methods: Data was collected on sociodemographic and clinical characteristics of 57 cases of SSI using a structured questionnaire. Pus swab was collected from the cases for culture and antimicrobial sensitivity. Blood culture was done for participants with fever of 37.50C and above. Frequencies and proportions were determined for bacterial etiology and antimicrobial susceptibility. Results: A total of 55 bacterial organisms were isolated from 46 patients. The most common isolate was *Staphylococcus aureus* - 22 (40.0%) followed by *Escherichia coli*- 11 (20.0%), *Acinetobacter baumannii*- 6 (10.9%), *Klebsiella pneumoniae* -5 (9.1%), *Pseudomonas aeruginosa*-4(7.3%), *Proteus mirabilis* 2(3.6%) and *Streptococcus pyogenes* 1 (1.8%). Methicillin Resistant *Staphylococcus Aureus* (MRSA) comprised 59% (13) of all *Staphylococcus aureus*. Gram positive bacteria had over 50% resistance to Ceftriaxone, Cotrimoxazole, Ciprofloxacin, Azithromycin, Erythromycin, Cefuroxime and Levofloxacin. Gram negatives had more than 50% resistance to Ceftriaxone, Cefotaxime, Ceftazidime, Cefepime and Levofloxacin. MRSA and *Acinetobacter baumannii* showed multidrug resistance. Conclusion: *Staphylococcus aureus* was the commonest causative agent for SSI with MRSA constituting 59% of *Staph aureus* infection. Organisms causing SSI were resistant to most commonly used antimicrobial agents at MTRH. Active surveillance for SSI causing organisms and their susceptibility patterns should be instituted at MTRH.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51141

DISINFECTION OF CONTAMINATED STEEL IMPLANTS WITH AN ER:YAG LASER

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Background: Infections related to orthopaedic procedures are considered particularly severe when implantation materials are used, because effective treatments for biofilm removal are lacking. In this study, the relatively new approach for infection control by using an Er:YAG laser was adapted to an orthopaedic setting. Methods: For preliminary testing, 42 steel plates and 42 pins were seeded with mixed cultures. The minimally necessary laser energy for biofilm removal was determined. We subsequently compared the effectiveness of biofilm removal with the Er:YAG laser and the cleansing of the metal implants with Octenidine-soaked gauze. We compared the effectiveness of biofilm removal on 207 steel pins from 41 patients directly after explantation. Sonication and scanning electron microscopy were used for analysis. Results: Laser fluences exceeding 2.8J/cm² caused a complete extinction of all living cells by a single laser impulse. Cleansing with Octenidine-soaked gauze and irradiation with the Er:YAG laser are both thoroughly effective when applied to seeded pins. In contrast, when explanted pins were analysed, we found a significant advantage of the laser procedure as far as the completeness of biofilm removal is concerned. Conclusion: We demonstrated the clear advantage of laser irradiation in the removal of fully developed biofilms from extracted half-pins. The Er:YAG laser offers secure, complete, and nontoxic removal of all kinds of pathogens from steel implants without damaging the implant and without the possible development of resistance. The precise noncontact removal of adjacent tissue is an advantage over other disinfectants.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 50599

ANTIBIOTIC IMPREGNATED BONE CEMENT MAY PLAY A ROLE IN THE MANAGEMENT OF EARLY INFECTION AFTER FRACTURE FIXATION WITH RETENTION OF THE IMPLANTS

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Background: Local antibiotic therapy has gained increasing attraction in the prevent and treatment of fracture infection. However, no reports have used local antibiotic therapy in the management of early infection after fracture fixation with retention of the implants. Methods: The patients were identified from our database and selected based on specific inclusion and exclusion criteria. Finally, ten patients with early infection after fracture fixation were included. All these fractures were fixed with plates, and the fracture infections were treated with irrigation, debridement and retention of the implant combined with systemic and local antibiotic therapy. The average time from initial procedure to debridement was 15 (9-25) days. The lateral surface of the plates were coated with antibiotic cement after through debridement. Bone union and infection recurrence were recorded. Results: The mean follow- up was 2.0 years (6 months to 4 years). The bone union rate was 100%, the average time to bone healing was 5.5 months. Infection recurred in one patient before bone healing, but the implants were left in place until bone healed, and the infection was eradicated after implants removal. Conclusion: Antibiotic impregnated bone cement may play a role in the management of early infection after fracture fixation.

Date: 2018-10-12
Session: Infections Free Papers (I)
Time: 08:00 - 10:00
Room: Room 522a+b+c

Abstract no.: 49882

A SYSTEMATIC REVIEW OF THE SINGLE-STAGE TREATMENT OF CHRONIC OSTEOMYELITIS

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Background: Despite advances in surgical and antibiotic therapies the treatment of chronic osteomyelitis remains complex and is often associated with a significant financial burden to the National Health Service. The aim of this review was to identify the different types of single-stage procedures being performed for this condition and to evaluate their effectiveness. Methods: Ovid Medline and Embase databases searched for articles on the treatment of chronic osteomyelitis. 3511 journal abstracts were screened by 3 independent reviewers. Following exclusion of paediatric subjects, animal models, non-bacterial osteomyelitis and patients undergoing multiple surgical procedures we identified 13 studies reported in English with a minimum follow up of 12 months. Each study was quality assessed and data extraction performed. Results: 505 patients with chronic osteomyelitis underwent attempted single-stage procedures. Following debridement a range of techniques are described to eliminate the remaining dead space including musculocutaneous flaps or insertion of S53P4 glass beads or antibiotic loaded pellets. The average follow-up ranged from 12 to 110 months. Success was defined as resolution of pain, no recurring sinuses and no requirement for further surgeries to treat infection. Success rates ranged from 60%-100%. Conclusion: There are currently a wide range of single-stage procedures being performed for chronic osteomyelitis with varying success rates. Treating patients with these methods in specialist centres can result in resolution of infection and may lead to improved quality of life for the patient. So far no one technique has been shown to be superior and further long term follow up data is required.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52369

IS THE SPECTRUM OF BACTERIAL INFECTIONS IN OPEN LONG BONE FRACTURES CHANGING?

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Introduction: Multidrug resistant Gram-negative bacterial infections in open long bone fractures of the lower limb presents a challenging problem. Resistance to commonly used antibiotic prophylaxis is escalating. This may dramatically impact the effectiveness of current regimen of antibiotic prophylaxis. Purpose: The purpose of our study was to determine the rate of multidrug resistant Gram-negative bacterial Infections of open long bone fractures of the lower limb. Methods: We performed a prospective cohort study on 170 patients with 206 open long bone fractures of lower limb from October 2015 to October 2016. During follow up, patients were evaluated for signs of infection using the Centers for Disease Control and prevention Criteria. The organisms were determined using routine microbiology culture. The minimum follow up was 9 months. Results: Of the 170 fractures, 71(35.6%) developed deep surgical site infection. The routine microbiology culture was positive in 30 patients (17.6%). 14(46.6%) grew Gram-negative organism, 12(40%) grew Gram-positive bacteria and 4(13.3%) grew both Gram positive and Gram-negative bacteria. The incidence of multidrug resistant Gram-negative infection in our series was 5.2%. Conclusions: It is very important to comprehend the evolution of bacteriology in open long bone fractures of lower limb. There is a high incidence of multidrug resistant Gram-negative bacterial infection in open long bone fractures of lower limb. This may possibly indicate that current antibiotic regimens need to be changed.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52139

PREVALENCE OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) IN PEDIATRIC OSTEOMYELITIS AND SEPTIC ARTHRITIS IN LAST ONE AND A HALF DECADE AND ITS ASSOCIATION WITH ADVERSE CLINICAL OUTCOME.

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BACKGROUND: The methicillin-resistant *Staphylococcus aureus* (MRSA) pediatric osteomyelitis and septic arthritis have been associated with more complications than other organisms. However, there is no large sample study available to provide data of causative organisms. **METHODS:** We performed a retrospective chart review study from 2003-2017 (15 years) records with diagnosis codes for osteomyelitis and septic arthritis in patients from age 0 to 18 years who underwent surgery in form of debridement or incision and drainage. We explored culture and organism reports to find out presence of MRSA. We compared the prevalence of MRSA in patients who underwent single surgery with patients who underwent more than one surgeries. **RESULTS:** A total of 753 patients were included. Patients with follow up less than one year and incomplete data were excluded. Of these, 22.84% (172/753) patients were culture positive for MRSA. In a group of multiple washout patients, prevalence of MRSA was 50.92% (55/108). In the other group of single procedure patients, prevalence of MRSA was 18.13% (117/645). The relative risk of multiple surgery in MRSA positive patients were 4.42 ($p < 0.001$) as compared to MRSA negative patients. **CONCLUSION:** Our study confirms that MRSA is the single most indicator for adverse clinical outcome in pediatric bone and joint infections. Excluding the patients who were never treated surgically is definitely the limitation of this study. We strongly recommend MRSA antibiotic treatment in all pediatric patient with bone and joint infection and it should not be delayed until operative cultures are obtained. **LEVEL OF EVIDENCE:** Level III.

Date: 2018-10-12
Session: Infections Free Papers (I)
Time: 08:00 - 10:00
Room: Room 522a+b+c

Abstract no.: 50730

COMPARATIVE STUDY OF ANTIBIOTIC-COATED NAILING VERSUS CIRCULAR EXTERNAL FIXATOR IN PATIENTS WITH INFECTED NONUNIONS OF LOWER EXTREMITY LONG BONES

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Introduction: Good result of treatment in infected non-unions of lower extremity long bones remains difficult task for orthopedic surgeon. Purpose: Open comparative study of X-Ray and functional results after antibiotic-impregnated cement nailing versus circular frame in patients with infected non-unions. Materials and methods: The study included 70 patients treated from 2009 to 2017. There were two groups: antibiotic-coated interlocking nailing (40 patients) and circular frame (30 patients), not differing by age ($U=591, p=0.919$), sex ($\chi^2=1.294, p=0.255$) and duration of the disease ($U=523, p=0.492$). We performed thorough debridement and fixed the bone either with AB-coated (PMMA+antibiotic) nail or with circular Ex-Fix. Patients additionally received intravenous and oral antibiotics according to the sensitivity. Partial weight-bearing was allowed after the surgery. Follow-up was performed in 6, 12, 24 and 52 weeks. We analyzed safety, early and long-term efficacy. Results: AB-coated nailing group has shown statistically significantly superior results compared to circular frame: shorter in-hospital stay 27.5[20.0;35.0]vs.87.0[53.0;124.0] days ($U=523, p<0.001$), less complication rate 22,5% vs. 65.3%, shorter duration of antibiotic therapy 6.0[6.0;6.0]vs.16[12.0;20.0] weeks ($U=73, p<0.001$), higher incidence of bony union 97,5% vs. 80% ($\chi^2=5.83, p<0.05$) and shorter time to union 6.0[5.0;9.0]vs.12.0[8.0;15.0] months ($U=73, p<0.001$), lower incidence of infection recurrence 32.5%vs.86.7%($\chi^2=20/385, p<0.001$), fewer surgical interventions 1.70 ± 1.04 vs. 4.76 ± 2.43 ($p<0.001$), higher LEFS score in 6 weeks 20.0 [17.5;21.0]vs.15.0[14.0;16.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 52529

REVIEW OF STIMULAN USE IN BONE INFECTION AND ITS OUTCOME

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Local release of antibiotic has advantages in the treatment of bone and joint infections. Adequacy of surgical debridement is still key to successful clearance of infection but addition of local antibiotics seems to afford greater success rates by targeting the residual organisms and delivering much higher local antibiotic concentrations than systemic antibiotics alone. Biodegradable ceramic carriers can be used to fill osseous defects, which reduces the dead space and provides the potential for subsequent repair of the osseous defect as they dissolve away. They also raise the possibility of single stage surgery with definitive closure and avoidance of subsequent surgery for spacer removal. There are only a few commercially available antibiotic carriers licensed for the treatment of osteomyelitis. Of these, Stimulan (Biocomposites, Keele, UK) does not contain antibiotics and is mixed with antibiotics at the time of implantation but this is currently considered off-label usage. We described a series of 199 patients who had vancomycin-loaded Stimulan as part of their management. Indications included chronic osteomyelitis, prosthetic joint infections and open fractures. Hematological parameters, eradication of infection, rate of infection recurrence and reoperation rate were evaluated during the follow-up. The rate of wound drainage in this series was 4.5% and was generally in cases using higher bead volumes. Our data suggests that vancomycin-loaded Stimulan is an acceptable delivery tool for local antibiotic delivery in the treatment of bone infections. Further studies are needed to examine the potential of improving bone and joint infection outcomes with this particular local antibiotic delivery system.

Date: 2018-10-12

Session: Infections Free Papers (I)

Time: 08:00 - 10:00

Room: Room 522a+b+c

Abstract no.: 51051

HOW RELIABLE IS THE CELL COUNT ANALYSIS IN THE DIAGNOSIS OF PROSTHETIC JOINT INFECTION?: A PROSPECTIVE STUDY

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Synovial analysis of joint aspirates is a key diagnostic tool, all major diagnostic algorithms include cell count (CC) and polymorphonuclear percentage (PMN%) as important criteria to make the diagnosis. In this context, we conducted this study to analyze the overall accuracy of CC and PMN%. A single center prospective analysis was performed with clinical data of included patients, with a total of 524 preoperative joint aspirations (255 hips, 269 knees). From aspirated synovial fluid we tested the leukocyte esterase activity, leukocyte CC and PMN%, we sent specimens for aerobic and anaerobic bacterial culture. Depending on the clinical results in accordance with the MSIS criteria for PJI 203 patients were then admitted for aseptic revision, and 134 patients for septic exchange. In 337 cases (64.3% of the study patients) was it possible to measure the cell count. The best cut-off level for PJI of all study patients was 2582 leukocytes/ μ L (Se 80.6%, Sp 85.2%) and a PMN% of 66.1% (Se 80.6%, Sp 83.3%). The chosen cut-off levels for PJI of total knee and total hip arthroplasty were 1630 leukocytes/ μ L (Se 83.6%, Sp 82.2%) and a PMN% of 60.5% (Se 80.3%, Sp 77.1%), 3063 leukocytes/ μ L (Se 78.1%, Sp 80.0%) and a PMN% of 66.1% (Se 82.2%, Sp 82.4%), respectively. Cell count and polymorphonuclear percentage are sensitive methods for diagnosing PJI of THA and TKA. However, there are differences in cut-off levels between knees and hips. International guidelines and diagnostic criteria need revisions in terms of these parameters.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 51572

LONG-TERM CLINICAL SAFETY STUDY: AN ANTIBACTERIAL HYDROGEL COATING OF OSTEOSYNTHESIS IMPLANTS

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Introduction: Infection after osteosynthesis remains a feared complication in trauma surgery. Various antibacterial coatings for implanted biomaterials are under study, aimed at reducing bacterial colonization and biofilm formation; however, only few technologies are currently available in the clinical setting. In vitro and in vivo studies have demonstrated the efficacy and safety of a fast resorbable (<96 h) antibacterial-loaded hydrogel coating (DAC ®, Novagenit Srl, Italy). Objectives: Aim of the present study is to assess the safety of an antibiotic-loaded DAC coating of internal osteosynthesis. Methods: 40 patients, who underwent internal osteosynthesis for closed fractures, were followed-up on average for 42 months (min: 36, max: 48 months). Clinical score (SF-12 score), laboratory tests and x-rays were performed at fixed time intervals. In 6 treated patients, bone histological examination was performed when removing the hardware. Results: No local or systemic side effects, that could be related to DAC hydrogel coating, were noted at the last follow-up. No infection was registered. Histological findings did not show any interference of the hydrogel with bone healing. Conclusion: This study shows that a fast-resorbable antibacterial hydrogel coating can be safely and successfully used in patients undergoing internal osteosynthesis for closed fractures.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49991

TUBERCULAR SPONDYLODISCITIS ASSOCIATED PSOAS ABSCESS IN PATIENTS WITH INTACT NEUROLOGY: A SUGGESTED 'TRIAD' PROTOCOL FOR A DIAGNOSTIC AND THERAPEUTIC APPROACH

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Introduction: Skeletal tuberculosis accounts for 10–20% of all cases of extrapulmonary tuberculosis with the most common form being tuberculous spondylodiscitis. Invariably they are associated with an iliopsoas abscess. However, there is no established protocol for evaluation and management of such cases and often is a matter of concern in the developing world. We describe a simple protocol for such cases that involves the “triad” of Percutaneous Catheter Drainage (PCD), CBNAAT based diagnosis and Antituberculous treatment. Materials and Methods: A total of 13 patients were clinically diagnosed with Pott’s spine and associated psoas abscess based on symptoms, signs, laboratory and radiological investigations. All these patients were selected for Ultrasound guided PCD. Pus collected was sent for CBNAAT/Genexpert analysis. Diagnosis was confirmed and MDR – TB was also screened. Antituberculous treatment was started with a four drug regime (H, R, Z, E) for 6 months followed by three drugs (H, R, Z) for 6 months and two drugs (H, R) for 6 more months i.e a total of eighteen months. Followups were done at 2 month intervals when clinical, haematological and radiological parameters were checked. Outcome assessment was done at 6 month intervals with an Oswestry Disability Index score. Results: At final followup, patients showed significant reduction in back and radicular pain. One patient required surgical drainage of abscess while MDR-TB was detected in another patient. We concluded that this “Triad” protocol not only confirms our diagnosis pathologically but also gives an efficient, safe and easy treatment option.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49561

INAPPROPRIATE MEASUREMENT OF POSTOPERATIVE C-REACTIVE PROTEIN IN ELECTIVE ORTHOPAEDIC CASES: A CLINICAL AUDIT

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Background: CRP is an acute phase reactant which rises in response to inflammation. We have noticed that postoperative CRP was requested which has been inappropriate where infection is not suspected. Objectives: We investigated the figures and reasons for requesting it. This quality improvement project aimed to reduce the cost of inappropriate early postoperative CRP testing at a district general hospital. Methods: Retrospective audit. All adult elective orthopaedic patients over a 6-week period were included. Trauma cases, procedures performed under local anaesthesia and day cases were excluded. We have reviewed the CRP requests for these patients within the first three postoperative days. Results: 96 patients were included (mean age 64.8y, range 18-88). CRP was measured in 31 (32%) postoperative patients; 15 (49%) hip replacements, 11 (33%) total knee replacements, 2 (6%) Achilles repair cases and 1 (3%) of each of the following: ankle fusion, knee arthroscopy, total shoulder replacement and revision of total elbow replacement cases. The reasons for requesting the CRP were routine post op monitoring in 17 (52%) cases, hot surgical site in 4 (13%) cases, sepsis in 4 (13%) cases, chest pain in 2 (7%) cases, pain and bruising in 2 (7%) cases, catheter in situ in 1 (4%) case and also diarrhoea in 1 (4%) case. We have identified that in 30 of these patients, there was no clinical reason for requesting a postoperative CRP. At a cost of £13.29 per test, our department spends £266/month or £3192/year on inappropriate testing. Conclusions: Early postoperative CRP testing is common, and may mislead clinical judgement. Avoiding inappropriate postoperative CRP testing in elective orthopaedic patients has a small, but significant economic benefit.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49718

MASQUELET TECHNIQUE FOR MANAGEMENT OF LARGE BONE DEFECTS WITH CHRONIC OSTEOMYELITIS

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Chronic osteomyelitis is a complex problem that results in considerable morbidity and can threaten viability of the limb. Thorough debridement and wound closure at the first stage is essential for infection control as well as sufficient grafting at the second stage to ensure bone union. Wide resection of infected bone improves the odds of achieving remission of infection in patients with chronic osteomyelitis. Aggressive debridement is followed by the creation of large bone defects. Masquelet technique, which is the use of a temporary cement spacer followed by staged bone grafting, is a recent treatment strategy to manage bone defect. In addition to certain biological advantages, the spacer offers a therapeutic benefit by serving as a vehicle for delivery of local adjuvant antibiotic to control local residual infection. This case series of 10 patients uses Masquelet technique to successfully manage chronic osteomyelitis. The induced membrane/ Masquelet technique for the treatment of post-traumatic osteomyelitis is a simple, reliable method, with good early results.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 52357

COMPLEX GAP NONUNION TREATMENT BY LRS

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Management of complex non-union is difficult due to presence of infections, deformity, shortening, bone loss, and lack of soft tissue coverage. Various techniques ranging from Pappeneu technique, Ilizarov's technique and more recently, formation of pseudo-membrane procedures, have been used. Before that, many such cases landed in amputations. Use of rail road fixator by LRS has simplified this procedure. The objective of the study is to avoid amputations in high energy impact accidents causing compound fractures, leading to lost bone pieces or when infection ensues and we have to remove the dead and necrotic bone. We have been treating patients of infected & Gap non-unions using LRS and I am presenting a series of 30 such patients. Initially all cases were managed with radical debridement of the infected soft tissue and the resection of the sclerosed and infected bone segment. Average duration of LRS application was nine months. We achieved bone transport from 4 Cms to 20 Cms. After achieving docking, the system was kept in place for half the duration, for which it was applied. Then, additional procedures like injecting bone marrow aspirate / bone grafting was done at the docking site or the regenerate site if required. Complications in the form of pin tract infection, loosening of the pins, were noticed in many patients. At the final outcome slight mal-union was the most common problem According to ASAMI scoring system, 48% had excellent result, 32% good result, and 20% had fair results.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49714

**PREOPERATIVE S. AUREUS SCREENING AND DECOLONISATION
PROTOCOL AS AN EFFECTIVE STRATEGY TO DECREASE DEEP
INFECTION RATE IN TOTAL JOINT REPLACEMENT PATIENTS**

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Efficacy data of preoperative decolonization of *S. aureus* nasal carriers undergoing hip or knee total joint replacement (TJR) on preventing prosthetic joint infections (PJI) is mixed. We aimed to determine effectiveness of preoperative decolonization of *S. aureus* carriers on PJIs. A quasi-experimental quality improvement study comparing 5-year baseline rates of deep PJIs per CDC/NHSN definition (2005-2010) to a one-year intervention period (2015-2016) was conducted. Consecutive TJR patients were included. Intervention consisted of nasal and throat screening for *S. aureus* pre-operatively, and decolonization of carriers with 2% intranasal mupirocin and chlorhexidine gluconate wipes twice daily over 5 days prior to surgery. All patients were re-screened on surgery date. During the intervention, 22.5% (424/1,883) of patients were *S. aureus* carriers. Of 361 patients who complied with decolonization protocol, 17.7% (64/361) remained carriers at surgery. The overall PJI rate was similar during the intervention phase (0.4%, 7/1883) compared to historic control (0.5%, 42/8505; OR 0.75; 95%CI 0.34-1.67, p=0.58). However, there was a significant reduction in PJI related to *S. aureus* in one case during the intervention (0.05%) compared to a rate of 0.3% in the control group (OR 0.16, 95%CI 0.02-1.18, p=0.049). All 7 PJIs in the intervention group occurred in non-*S. aureus* carriers. Broad implementation of active screening for *S. aureus* and decolonization before TJR was feasible with reasonable compliance. Less than 20% of carriers remained colonized at surgery, and none of the decolonized patients developed a PJI. The reduction compared to the historical control was statistically significant for *S. aureus* PJIs, only.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 51227

DOES EARLY DEBRIDEMENT IN OPEN FRACTURES RESULT IN LESS COMPLICATIONS?: A PROSPECTIVE STUDY IN A TROPICAL SETTING

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The philosophy of urgent management of open fractures has been challenged recently in literature from the West. Deferred management up till 24 hours has been suggested for better resource allocation and this has showed acceptable outcomes. We felt that this may be inappropriate in warmer tropical climates and in developing countries where patients often present with grossly contaminated wounds. We evaluated the effect of time to debridement on union, infection rates and quality of life in open lower limb fractures. 182 patients with 206 fractures involving the femur and/or tibia/fibula were recruited in a prospective observational cohort study over 1 year. The cohort was empirically divided into two groups (early and late) based on the time to debridement (less than or more than 12 hours from injury). Patients were followed up till 9 months. The late group had a significantly higher risk for non-unions (OR, 6.94; 95% CI, 2.52-19.12) and infections (OR, 7.49; 95% CI, 2.62-21.39). We observed a linear 6% increase in the infection risk for each hour of delay for the initial 50 hours ($p < 0.0001$). As opposed to 83% of patients in the early group, only 34.7% of the patients in the late group had returned to work at 9 months. This study contradicts recent publications from the West where the environment and mechanism of injury is different. As most open fractures occur in developing countries, our study confirms the need to treat these injuries as soon as possible and to formulate region based protocols.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 50896

ENHANCED BONE HEALING OF GUSTILO III SEVERE OPEN LONG BONE FRACTURES TREATED BY IMMEDIATE ANTIBIOTIC-FORMULATED BONE GRAFTING

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Synthetic bone-substitute coated by polymer-lipid-encapsulation-matrix containing doxycycline (PLEX-DBG), constantly release antibiotics for one month, was used in a randomized controlled study in 4 patients with Gustilo I and II and 47 patients with Gustilo IIIA and IIIB open long bone fractures. Interim results in 24 patients treated with PLEX-DBG plus standard of care (SOC) versus 27 treated with SOC completing 16 weeks follow-up are presented. In the 12 patients treated with PLEX-DBG in addition to SOC, median time from surgery to the initiation of bone healing, as assessed by the presence of a callus in one out of four cortices, was reduced by approximately 31%, compared to 12 patients in the SOC only group. Median time from surgery to primary endpoint; presence of solid radiographic markers for bone healing, assessed by the presence of a callus in three out of four cortices, was reduced by 20% compared to SOC only group. More than 30% of patients treated with the SOC alone had not reached the primary endpoint compared to approximately 8% of patients treated with PLEX-DBG and the SOC. Pain-free weight bearing was demonstrated in 63% of patients treated with PLEX-DBG compared to none of the patients treated with the SOC alone. In addition, statistically significant reductions in Visual Analogue Scale twelve weeks after surgery was observed. No product-related adverse events were reported. Conclusion: Immediate bone grafting with doxycycline formulated bone graft in sever open long bone fractures demonstrated early bone union and reduction of pain on weight bearing.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49756

PROSTHETIC JOINT INFECTIONS: IS GUIDELINE-CONSISTENT SURGICAL TREATMENT BENEFICIAL?

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The diagnosis and treatment of prosthetic joint infection (PJI) remains challenging. In 2013, both the Infectious Diseases Society of America (IDSA) guidelines and an international consensus' recommendations on PJI were published, providing a consistent approach to PJI management. We undertook a study to compare outcomes of PJI cases managed in accordance with IDSA versus those managed outside of the same. A retrospective cohort study of a consecutive series of TJR patients with subsequent deep PJI was undertaken to determine historical clinical variation relative to recently established management guidelines. All cases were completed at one arthroplasty centre over a five-year period predating IDSA guideline development. Of 8505 TJRs, 267 (3.1%) were diagnosed with subsequent PJI. Of these, 42/8505 (0.5%) were culture positive deep PJIs, with 38/42 (90.5%) managed surgically. The odds of treatment failure among cases not managed in accordance with IDSA were 11 times greater as compared to guideline-accordant cases (OR 11, 95%CI 1.84-65.7;p=0.006). This difference was most pronounced among irrigation and debridement cases. We could not demonstrate any significant difference in treatment success or failure for one-stage or two-stage exchange. It is our conclusion that surgical management of PJI in accordance with existing guidelines can optimize success of PJI treatment. In particular, aggressive surgical treatment (including prosthesis removal) is likely warranted in cases where there has been greater than three weeks of PJI symptoms. In cases where deviation from existing guidelines is considered, it is important for physicians to weigh the risk of inferior outcome and counsel patients accordingly.

Date: 2018-10-12

Session: Infections Free Papers (II)

Time: 16:00 - 17:30

Room: Room 522a+b+c

Abstract no.: 49500

**NON-INVASIVE DIAGNOSTIC OF PERIPROSTHETIC JOINT INFECTION
BY URINARY PEPTIDE MARKERS**

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ETTINGER

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Background: Immunohistochemical analysis revealed a variety of differentially expressed proteins in septic and aseptic prosthesis loosening. Proteins are typically degraded to peptides that may pass the blood-kidney-barrier due to their small mass. The aim of this study was to assess if PJI can be diagnosed by the urinary peptide excretion pattern. Methods: According to MSIS criteria, patients were diagnosed as having a high-grade infection (group I, n=10), a low-grade infection (group II, n=10) or an aseptic loosening (group III, n=10) of their knee or hip prosthesis. Preoperatively, a urinary sample was collected and analyzed using capillary electrophoresis coupled to mass spectrometry. Peptides with a differential urinary excretion between the different groups were used to establish a multimarker model. Results: A total of 378 peptides were differentially excreted between group I and III, and 293 peptides between group II and III. Out of these two peptide pools 137 peptides were identical and all of these demonstrated the same direction of regulation. The identified peptide markers were fragments of structural extracellular matrix proteins, which is potentially due to their origin from the periprosthetic tissue. A multimarker model with 83 peptides revealed the best diagnostic performance for diagnosing PJI (group I and II) with a sensitivity of 95%, a specificity of 90% and an AUC of 0.96. Conclusion: The diagnostic of PJI by the urinary peptide excretion pattern seems to be a promising approach. This procedure is non-invasive and has therefore the potential to become a part of the diagnostic workup of PJI.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 52722

**KEY NOTE LECTURE: NON-IDIOPATHIC CLUBFOOT: FROM THE
BEGINNING TO THE END**

Patricia FUCS

, . (BRAZIL)

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 51434

OUTCOMES OF MODIFIED REVERSE STEP-CUT OSTEOTOMY IN CUBITUS VARUS DEFORMITY

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Introduction: Osteotomies for cubitus varus are marred with complications including inadequate correction, nerve palsy, lateral condyle prominence, loss of motion, posterolateral rotator instability. There is no such technique at present that gives maximum possible deformity correction and cosmetic appearance. We used a modified reverse step-cut osteotomy with medial translation of distal fragment. By this technique we have corrected varus and sagittal plane deformity and tried to achieve anatomical alignment of the elbow and reduced the lateral condyle prominence. **Methods:** Fifteen patients with cubitus varus resulting from malunited supracondylar humerus fractures were included in study group. We designed new technique modified reverse step-cut osteotomy. In contrast to reverse V osteotomy, we used posterior approach to distal humerus and transverse osteotomy cut was given just above olecranon fossa. In order to prevent condylar prominence additional correction by taking consideration of normal side carrying angle at the level of elbow joint and medial apical osteotomy cut was given in accordance with this factor followed by medial translation of distal fragment. **Results:** We have achieved better correction and cosmetic outcome by realigning the anatomical axis of humerus and forearm axis. The radiological, functional and cosmetic appearance in the postoperative period was evaluated and was found to have statistically significant improvement. **Conclusion:** With this new modified reverse step-cut technique, we achieved satisfactory results with acceptable cosmetic appearance and functional outcome with minimal complications. We recommend this technique as safe, reliable, reproducible, technically easy procedure for correction of varus and sagittal malalignment.

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Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 51492

NONOPERATIVE MANAGEMENT OF TYPE II SUPRACONDYLAR HUMERUS FRACTURES IN CHILDREN: A PROSPECTIVE COMPARATIVE STUDY

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Gartland extension type supracondylar humerus (SCH) fractures are the most common elbow fracture in the pediatric population. Operative vs. non-operative treatment consensus exists for Gartland Types I and III fractures, but controversy remains for Type II fractures. This is a prospective observational study to determine clinical, functional, and radiographic outcomes of pediatric non-operatively treated Type II SCH fractures. Patients aged 2-12 years with an isolated, closed, Gartland Type II SCH fracture were recruited and underwent closed reduction and immobilization through taping, long-arm casting, or splinting at a single institution. Demographic, radiographic, complications and functional outcome data were collected. The primary outcome measure was change in lateral humeral capitellar angle (LHCA) between post-reduction and final follow-up. Secondary outcomes included change in Baumann's angle (BA), Flynn's Elbow Score, complications, and functional outcome scores. A total of 44 participants with a mean age of 5.80 years (95% CI [5.21,6.38]) underwent non-operative treatment (30 casted, 13 taped, 1 splint). At 3 months post-reduction, mean change in LHCA was 6.48° [4.38,8.59] and 11.54° [7.74,15.34] in the casting and taping groups, respectively. At 1-year post-reduction, mean change in LHCA was 18.95° [13.11,24.78] and 9.20° [0.65,17.75] in casting and taping groups, respectively. Taping resulted in adequate maintenance of reduction and safe immobilization for Gartland Type II fractures compared to casting, which saw clinically significant loss of reduction at final follow-up. Findings suggest that both taping and casting are potentially adequate methods of immobilization producing good functional outcomes; however, taping may result in better radiographic outcomes than casting.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

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Room: Room 524a

Abstract no.: 51798

COMPARISON OF EFFICACY OF ABOVE ELBOW POP VERSUS BELOW ELBOW POP IN DISTAL FOREARM DISPLACED FRACTURES IN CHILDREN

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Introduction: There is an ongoing debate about the treatment of displaced distal forearm fractures in children. Objective: To compare the efficacy of above elbow versus below elbow POP cast in distal forearm displaced fractures in children. Study design: Randomized Controlled Trial. Duration of study: 1st December 2014 till 31st May 2016. Methods: 264 patients were selected using consecutive non-probability sampling and were randomized into two groups, one group underwent MUA+above Elbow POP while the other group underwent MUA+below elbow POP. Efficacy was checked at 1 week by X-rays showing presence of re-displacement. Results: 56% patients were male while 44% patients were female. Bone involvement stood at 14.8%, 54.9% and 30.3% for Ulna only, Radius only and Ulna+Radius respectively. Efficacy was 70.45% in the below elbow group as compared to 52.2% in above elbow group ($p=0.002$). Conclusion: Below Elbow Cast is better than Above Elbow cast in the treatment of displaced distal forearm fractures in children in terms of re-displacement.

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Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 51767

**THE STANMORE TRIANGLE OF PAEDIATRIC SHOULDER INSTABILITY:
TRIANGLE OR DIAMOND? A SERVICE EVALUATION CONDUCTED AT
THE ROYAL MANCHESTER CHILDREN'S HOSPITAL**

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Paediatric Shoulder instability is the leading pathology seen by the shoulder service at the Royal Manchester Children's Hospital. The management of paediatric shoulder conditions is therefore of paramount importance in reducing financial costs to the NHS. However, children are having to wait for long periods to be reviewed within this service. This is neither ideal nor acceptable. To evaluate the shoulder service assessment tool which is a data capturing method for subjective and objective shoulder examination at the Royal Manchester Children's Hospital and identify whether waiting times can be cut by improving initial assessment and pathway based care. One hundred paediatric patients aged between 0-18 with a history of a shoulder complaint were recruited and their assessments retrospectively evaluated. Demographic data was analysed using gender, age and laterality of injury. Cluster analysis was completed to allow for the formation of clusters statistically. Significant differences were found showing that females were more predisposed to birthing trauma secondary to the hormone relaxin, whereas males were more predisposed to traumatic injury secondary to poor decision making. The average age for presentation with a shoulder injury was 10.9 years of age with most shoulder complaints occurring after 11 years of age. The ideal number of clusters was four clusters, demonstrated by three separate types of cluster analysis, statistical significance was demonstrated in the formation of four clusters. The Stanmore Triangle of shoulder instability fails to capture all the data effectively for the paediatric population, a diamond format is more appropriate to provide a visual representation.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 49654

A MODIFIED TRIANGLE TILT OSTEOTOMY WITH ANTERIOR SUBSCAPULARIS RELEASE AND TERES MAJOR TRANSFER FOR SHOULDER INTERNAL ROTATION CONTRACTURE DUE TO OBSTETRIC BRACHIAL PLEXUS PALSY

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Background: Internal rotation contracture of the shoulder (IRC) due to obstetric brachial plexus palsy (OBPP), is usually associated with Scapular Hypoplasia Elevation And Rotation (SHEAR) deformity and posterior shoulder instability. Triangle tilt osteotomy (TTO) corrects the bony deformity blocking external rotation of the humeral head. However, it was originally conceived as a secondary procedure following unsatisfactory soft-tissue release and tendon transfer. Patients and methods: This prospective study was performed between January 2015 and December 2016 in the Orthopaedic department of our University Hospital. Fifteen children with (IRC) due to (OBPP) and no previous surgeries were treated by a modified (TTO) combined with anterior subscapularis release and teres major transfer. The mean age at surgery was 7.1 years. The clavicle was osteotomized from a proximal extension of the deltopectoral approach. The acromion osteotomy and teres transfer were done through 2 separate posterior incisions. The arm was splinted postoperatively in abduction and external rotation for 6 weeks. The mean follow-up was 20.9 months. Results: All osteotomies healed. Mean external rotation and elevation improved from -13.7° and 41.7° to 25.3° and 103° respectively. Glenohumeral congruence improved in post-operative CT. The mean modified Mallet score improved from 10.5 to 18. The mean bugler's sign decreased from 112° preoperatively to 29° postoperatively. Resting arm position improved. No major complications were observed during the follow up. Conclusion: A modified (TTO) combined with anterior subscapularis release and teres major transfer improves shoulder external rotation/elevation and function in children with shoulder (IRC) due to (OBPP).

Date: 2018-10-12
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Room: Room 524a

Abstract no.: 51830

LENGTHENING IN CONGENITAL RADIAL CLUB HAND TYPE IV

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Background: The predominant characteristics of radial club hand are defects of the radius, carpal bones, and radial rays, particularly the thumb. A severely bowed ulna may contribute further to the clubbed appearance. The primary objective of lengthening is to improve the appearance (and function if possible) of the upper limb. Patients and Methods: 13 patients with Heikel's type IV congenital radial club hand (with previous wrist centralization) were operated upon. The patients' average age was 5.4 years. Average ulnar shortening was 14.5 cm. (representing 48% of contralateral forearm length) with mean angular deformity of 40°. A one stage procedure including acute correction of the deformity via an ulnar distal closing wedge osteotomy and the application of a mono-plane lengthening device was done. Lengthening was started - from the osteotomy site - 10 days later. Results: Ulnae were lengthened 6 – 9.3 cm (average 7.8 cm); representing 32 – 61 % of their original length (average 52%) and an average of 81% of contralateral forearm length; with a healing index of 35 days (range 27 – 45 days). The angular deformity was completely corrected in all patients; with late mild recurrence of the deformity in two patients. No early or late major complications were encountered during a follow up period of 4.8 years. Conclusion: This one stage procedure of acute correction of the deformity and lengthening of the ulna using a mono-plane lengthening device is a simple technique with satisfactory results and few reported complications.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 50549

ASSESSMENT OF RESIDUAL LIMB-LENGTH DISCREPANCY FOLLOWING PERCUTANEOUS EPIPHYSIODESIS

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Introduction: Percutaneous drilling and curettage epiphysiodesis (PDC-E) is commonly performed in growing children with leg length discrepancy (LLD). Currently, PDC-E is considered successful if LLD at maturity is inferior to 15mm, without accounting for absolute limb height or patient specific functional needs. This study aims at evaluating PDC-E using different definitions of success. Methods: Medical records of all LLD patients operated between 2002 and 2012 were retrospectively reviewed. Radiologic measurements were performed on teleoroentgenograms, standing pelvis radiographs or scanograms. LLD was calculated as the height difference between the femoral heads. Coronal alignment was assessed using standard measurements. Success was defined as: 1) 10mm residual LLD threshold, 2) 15mm threshold, 3) final LLD of up to 1.5% of the contralateral limb at maturity, 4) correction at maturity of over 50% of initial LLD. Paired t-tests allowed values comparison. Results: Amongst 86 operated patients, 74 had a complete follow-up. Average pre-operative LLD was 26.0mm (\pm 8.56) compared to 13.0mm (\pm 9.52) at maturity ($p < 0.001$). Five patients had an angular deviation larger than 5°, which was systematically located on the non-operated limb. Overcorrection occurred in 6 patients. Success rates were 49% ($p < 0.05$), 65%, 61% and 57% for definitions 1 to 4. Conclusion: A 10mm threshold might be too stringent, while definitions 2, 3, and 4 could be interchanged. In addition to residual LLD, other criteria such as overall functional outcome or the need for further surgery should be added to assess PDC-E success.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 51981

IS 'CLOSE' RADIOGRAPHIC FOLLOW-UP REALLY NECESSARY IN THE NON-OPERATIVE MANAGEMENT OF PAEDIATRIC HUMERAL SUPRACONDYLAR FRACTURES?

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Aim: Supracondylar humeral fractures are the most common fractures about the elbow in children. Most can be managed non-operatively. These patients usually have repeated radiographs to monitor for displacement from the original position. The purpose of this study was to determine the incidence of later displacement during the non-operative management of paediatric supracondylar fractures. **Methods:** This was a retrospective cohort study. Inclusion criteria were children aged under 16, with a supracondylar fracture of the distal humerus that was managed non-operatively. The study period was four consecutive years (2013-16). Radiographs were analysed by two observers independently to classify the fractures according to the AO classification system, and to determine the incidence of displacement. **Results:** 164 cases were included in this study. The mean age was 5.47 yrs at presentation (Range 1-12). There were 112 AO grade 1, 48 AO grade 2 and 4 AO grade 3 fractures. All patients had at least one follow up radiograph in the immediate post injury period (6 weeks). 1 patient (AO grade 3) suffered late displacement (2 weeks) and needed subsequent reduction and K-wire fixation. There was no displacement in the remaining 163 patients. **Conclusion:** Based on our results, we recommend that supracondylar fractures be classified according to the AO system when planning management, as AO type 1 and type 2 fractures did not displace, so do not need any further radiographic follow-up. This would save resources, and reduce inconvenience for families. AO type 3 fractures should be monitored.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 52476

OUR EXPERIENCE OF TEMPORARY EPIPHYSIODESIS FOR CORRECTION OF ANGULAR LIMB DEFORMITIES IN CHILDREN

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Introduction: Nowadays epiphysiodesis with tension band devices gains popularity. Those techniques harness the natural ability of the child to grow without a permanent disturbance. The purpose of this study is to present our experience with Hinge plate for correction of lower limb deformities in children. Methods: From 2012 to 2017, we performed 29 hemiepiphysiodesis in 14 patients, using Hinge plate. Etiology of deformities includes metabolic and congenital conditions. The initial deformity and the results achieved were assessed by mechanical axis deviation (MAD) and femortibial angle (FTA). The average follow-up was 23 mo (2-55 months). Average time of epiphysiodesis was 21 mo (2- 38 months) before removal or end of follow-up. Results: Satisfactory correction was achieved in 8 patients, the plates were removed. Skeletal maturity was reached in three cases. In one case at the end of growth deviation was not corrected completely. In the remaining 5 cases correction is still in progress. The average improvement of FTA was 21.28 ° (from 5.9 ° to 27.2 °), the average improvement of the MAD was 40.5 mm (6 to 99 mm). We observed one plate extrusion in our early cases requiring reinsertion, and one case of a deformity relapse requiring re-epiphysiodesis. No case of a mechanical failure of plate or screws was observed. Conclusion: Temporary epiphysiodesis with the Hinge plate is an elegant, reversible, and atraumatic method for limb deformities correction in children. It is appropriate for use in early childhood and in case of "sick physis" with unpredictable growth.

Date: 2018-10-12

Session: Paediatrics Free Papers (II)

Time: 08:00 - 10:00

Room: Room 524a

Abstract no.: 51781

BLOUNT'S DISEASE: THE MYSTERY OF IMPLANT FAILURE STILL PERSISTS WITH EIGHT-PLATE GUIDED HEMIEPIPHYSIODESIS

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Although Erlacher has reported non-rachitic tibia-vara, Blount got his name by describing "osteochondrosis deformans tibiae" in 1937. Due to unknown etiology, it affects posteromedial proximal-tibia leading to a characteristic progressive tibia-vara, procurvatum and internal rotation with limb length discrepancy leading to premature osteoarthritis of the knee. For decades, the Blount staple has been used for angular deformity correction in children with open growth plates. The eight-plate based on tension-band principle introduced by Stevens in 2006. It is said to be superior to the Blount staple for angular deformity, as it is less likely to break or migrate, has more peripheral action of hinge and achieves guided reversible growth arrest. However, few publications in the last decade claims high failure-rates of eight-plates in Blount's disease, but no systemic review has been done till date. Aim of our retrospective study is to confirm such a high failure-rates by comparing our results with a systemic review. Using PRISMA guidelines, we searched 5 online databases like PubMed to include 7 studies that met our criteria. We performed systemic review comparing the various aspect of implant failure in terms of mechanical breakage, non-correction and relapse. This study confirms that failure-rates of eight-plates are exceptionally high from 29-100% ($p < 0.001$) in Blount disease. With an average 48.5 months follow-up, our study of 25 extremities in 17 children suggested 44% failure-rate which was not limited to late-onset, high-deformity or obesity as suggested by previous studies. We recommend the use of stronger implant with solid screws for Blount's disease in future.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 52230

CONSERVATIVE MANAGEMENT COMPARED WITH PLATE FIXATION OF DISPLACED MIDSHAFT CLAVICULAR FRACTURES: A PROSPECTIVE RANDOMISED CONTROLLED TRIAL

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Methods: In a randomised controlled trial , 72 patients with a displaced midshaft fracture of the clavicle were randomized (by chitbox method) to either operative treatment with plate fixation (36 patients) or nonoperative treatment with a sling (36 patients). Outcome analysis included standard clinical follow-up DASH score, and plain radiographs. 6 months of follow-up was conducted. There were no differences between the two groups with respect to patient demographics, mechanism of injury, associated injuries, Injury Severity Score, or fracture pattern. **Result:** DASH scores were significantly improved in the operative fixation group at all time-points ($p < 0.01$). The mean time to radiographic union was 23.5 weeks in the non-operative group compared with 16.4 weeks in the operative group ($p = 0.001$). There were two nonunions in the operative group compared with seven in the nonoperative group ($p = 0.042$). Symptomatic malunion developed in nine patients in the nonoperative group and in none in the operative group ($p = 0.001$). At one year after the injury, the patients in the operative group were more likely to be satisfied with the appearance of the shoulder ($p = 0.001$) and with the shoulder in general ($p = 0.002$) than were those in the nonoperative group. **Conclusion:** Operative fixation of a displaced fracture of the clavicular shaft results in improved functional outcome and a lower rate of malunion and nonunion compared with nonoperative treatment at 6 months of follow-up. Hardware removal remains the most common reason for repeat intervention in the operative group.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 49665

DOES THE NON-RECONSTRUCTABLE RADIAL HEAD FRACTURE EXIST?

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Introduction: Satisfactory internal fixation of comminuted radial head fractures is often difficult to achieve, and radial head resection has been the accepted treatment. In this study, we discussed the extracorporeal reconstruction of the highly comminuted radial head fractures and their re-implantation as bioprosthesis. Method: We performed this technique in 43 cases, we could follow up 38 cases. We did extracorporeal radial head reconstruction using either Vicryl sutures or absorbable pins. Then we reimplanted it back without fixing it to the shaft and neck. Results: We evaluated the patients according to the Broberg – Morrey Score, Mayo Clinic Functional Score, Radin – Righsborough Score. 33 patients scored excellent and good 2 patients scored fair, 1 patient poor, 27 patients returned to their previous jobs (e.g. artistic blacksmith operated/replanted on the dominant side). Conclusion: Comminuted fractures of the radial head, which would otherwise require excision, can be successfully treated with an 'on-table' reconstruction technique.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 51823

A MODIFIED MASQUELET TECHNIQUE FOR THE FOREARM INFECTED SEGMENTAL BONE LOSS

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Introduction: The use of a temporary bone cement spacer followed by bone grafting, is one of the recent treatment strategies for post-traumatic bone defects, especially in the presence of infection. **Patients and Methods:** This is a prospective study that includes a series of 16 patients with infected long bone defects in the radius or ulna. Patient's age was from 9 - 46 years. Average bone loss was 6.5 cm. (range: 4.5 – 11 cm.). All patients were treated with the technique of free non-vascularized bone grafting and plate fixation following placement of an antibiotic-loaded cement spacer. A special novel modification in the original technique; was bone stabilization during 1st. stage using special K. wire internal construct (instead of external fixation). **Results:** All cases showed bone union with sound consolidation in all; with persistence of infection in only one case. Total complications were few and minor after a minimum follow-up of two years (range 2-3.5 y.). **Conclusion:** This modified Masquelet technique is a satisfactory option in the management of infected segmental forearm bone defects at a low complication rate.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 51819

ADVANTAGES OF EXPULSION-PROOF PINS IN THE TREATMENT OF OLECRANON FRACTURES WITH TENSION BAND WIRING: COMPARISON WITH A CONTROL GROUP

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Introduction: Tension band wiring is considered the standard treatment for transverse olecranon fractures. Its main complications are pin migration and discomfort caused by the hardware. We have designed and used “expulsion-proof” pins that are shaped to prevent migration and reduce discomfort. This study compared the complication rate between our device and Kirschner pins (controls). Material and methods: This retrospective, single-center, multi-operator, observational, study examined data from January 1996 to December 2014. The primary outcome was the occurrence of pin migration. Secondary outcomes were the occurrence of one or more additional complications and the hardware removal rate. Results: The study enrolled 101 patients: 53 (52.4%) with expulsion-proof pins (EPP) and 48 (47.6%) controls. No cases of migration (0%) were found in the EPP group versus 21 (43.7%) cases in the controls ($p < 0.05$). One or more complications occurred in 18 (33.9%) patients in the EPP group versus 46 (95.8%) controls ($p < 0.05$). There was material discomfort in 13 (24.5%) cases and 1 (1.9%) case of secondary displacement in the EPP group, compared with 38 (79.2%) and 7 (14.6%) cases, respectively, in the controls ($p < 0.05$). The rate of delayed consolidation was statistically identical in the two groups ($p = 0.103$). The hardware was removed in 13 (24.5%) cases in the EPP group compared with 36 (75%) controls ($p < 0.05$). Conclusions: In comparison with the standard technique, our expulsion-proof device avoids pin migration and decreases the frequencies of complications and hardware removal.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 51368

MANAGEMENT OF NEGLECTED DISLOCATIONS AND FRACTURE-DISLOCATIONS OF THE ELBOW

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We performed treatment of 37 patients with neglected dislocations and fracture-dislocations of the elbow, including 29 patients with "unhappy triad of the elbow joint". Average age of patients was $38,5 \pm 11,7$ years. There were three groups of patients: Group 1 - untreated patients (17), up to 4 weeks after injury; Group 2 - previously operated patients (9), with no signs of dislocation, but with pain, instability and contracture in the elbow; Group 3 - chronic instability or dislocations of the elbow joint (11 patients). Group 1, after elimination of dislocation, restoration of anterior capsule integrity was performed with synthesis of coronoid process of the ulna and head of the radius and suture of damaged ligaments. Group 2 - arthrolysis of elbow joint and restoration of ligaments were performed. Group 3, after elimination of dislocation or subluxation, anterior capsule plastic and radial head arthroplasty (in case of bone defects) were performed. In patients with Essex-Lopresti injury we also made ulnar shortening osteotomy. Posterior cast immobilisation on upper extremity with elbow extended in 30 degrees was applied after surgery. Rehabilitation started from first day after operation, included immobilization in extension (30°) for night and flexion of the elbow (over 90°) during day period. According to MEPS scale we obtained excellent and good results of treatment in group 1 in 84% of cases. In groups 2 and 3 with more neglected injury we received excellent and good results in 53% patients, fair - in 31% and poor - in 16% of cases.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 50424

CLASSIFICATION AND TREATMENT OUTCOMES OF DISTAL CLAVICLE FRACTURES BASED ON CORACOCLAVICULAR LIGAMENT RUPTURE

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Purpose: Some studies have reported postoperative acromioclavicular dislocations in distal clavicle fracture cases. In this study, we classified these fractures into three types based on the rupture of coracoclavicular ligaments (conoid and trapezoid ligament) and investigated the treatment outcomes of these fractures. **Methods:** Patients from 45 cases with distal clavicle fractures were enrolled in the study. Three-dimensional computed tomography images of all patients were obtained, and the cases were classified as follows: type 1 (10 cases), in which the ligaments were preserved; type 2a (2 cases), in which only the trapezoid ligament was ruptured; type 2b (15 cases), in which only the conoid ligament was ruptured; and type 3 (18 cases), in which both the ligaments were ruptured. The treatment procedures comprised hook-plate fixation (24 cases), single locking plate fixation (11 cases), and combined locking plate and coracoclavicular fixation (3 cases). **Results:** In types 1 and 2, no acromioclavicular dislocations were observed regardless of the fixation method. In type 3, 6 of 18 cases exhibited dislocations. Of these, all four cases that underwent single locking plate fixation exhibited dislocation. **Discussion:** In type 3, postoperative acromioclavicular dislocations were observed, indicating that force had been applied to the distal bone fragments. Our results revealed that single fixation with a locking plate was unable to prevent postoperative dislocation in cases where both the ligaments were ruptured. If a locking plate is used, the addition of temporary coracoclavicular or acromioclavicular fixation is considered necessary.

Date: 2018-10-13

Session: Trauma Free Papers (Upper Limb)

Time: 10:30 - 12:00

Room: Room 517d

Abstract no.: 52228

MANAGING COMPLEX UNSTABLE RADIAL HEAD FRACTURES

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Introduction: Stable Radial head fractures are common injuries with good outcomes. However, unstable Radial head fractures with associated injuries causing elbow instability, are complex injuries with poor outcomes. These fractures are invariably difficult to reduce and fix and are best treated with Radial head arthroplasty, with good functional outcomes. Methods: We have retrospectively assessed our hospital data for Complex Radial head fractures who underwent Radial head arthroplasty (with or without ligament repair) over the last 4 years. They were all operated by Upper limb surgeons. We reviewed their demographics, mode of injury, time to surgery, operative notes, rehabilitation times, functional & radiological outcomes and any complications. Results: There were 19 patients (Mason 3/4) over a period of 4 years that underwent this procedure. All of them had an unstable injury pattern. They were predominantly male, average age of the cohort being 48 years, and were usually operated within 2 weeks following their injury. Most of the patients achieved complete functional recovery by 12 weeks. Limitations in terminal extension was a common but acceptable outcome. Regarding the rotational arc, Pronation improved better as compared with Supination, and was functionally acceptable. Two patients had to undergo a second procedure; one for removal of prosthesis (overstuffing of the radio-capitellar joint) and the other for extensive soft tissue release to gain range of movement. Conclusion: Radial head arthroplasty (with / without ligament reconstruction) for unstable radial head injuries allows early mobilisation with good functional outcomes and minimal complications.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 50706

MULTIMODAL PROPHYLAXIS OF THROMBOEMBOLISM IN TOTAL HIP ARTHROPLASTY

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We present our advancements, research and experience in the prevention of venous thromboembolism (VTE) following THA at the Hospital for Special Surgery, NY. Over the last five decades we have identified the exact timing of the thrombogenic stimulus, which occurs at the time of the invasion and instrumentation of the femoral canal. We also defined the role of magnetic resonance venography, which can identify intrapelvic clots, not visualized during routine ultrasound. Furthermore, we established the role of certain genetic and acquired factors (thrombophilia and hypofibrinolysis), which increase the risk of VTE. Based on these studies, we implemented in the late 1980s a Multimodal Prophylaxis (1) consisting of a series of safe preventive measures which are applied prior, during and after surgery, addressing all three components of the Virchow triad (hypercoagulable state, stasis and endothelial injury). They include preoperative identification of predisposing factors, discontinuation of procoagulant medications, epidural hypotensive anesthesia, expeditious surgery, minimizing the obstruction of the femoral vein which occurs when the lower extremity is kept in extreme positions, pneumatic compression boots, prompt mobilization, and frequent and vigorous dorsiflexion of ankles throughout the recovery period. If these safe preventive measures are carefully followed, postoperative aspirin prophylaxis is sufficient in the patient with no predisposing factors and who mobilizes expeditiously. We don't favor aggressive anticoagulation which is associated with bleeding and higher all-cause mortality (2). Our clinical experience of over 30,000 THA performed during the last couple of decades demonstrates that this Multimodal Prophylaxis is safe and effective, resulting in a very low incidence of VTE.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 51829

AN EVALUATION OF METAL ION LEVELS BETWEEN PATIENTS WHO UNDERWENT A 'REVISION' PROCEDURE FOR BOTH HIP RESURFACING AND TOTAL HIP ARTHROPLASTY

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INTRODUCTION: There were over 60,000 metal-on-metal hips implanted in the United Kingdom. In 2018, we are now well aware of both the complications and the implications of raised metal ion levels in metal-on-metal (MoM) hips. One of the important factors for the release of metal ion levels is the diameter of the articulation used. Our study follows up 890 patients that underwent a resurfacing or arthroplasty between the years of 2009 and 2014. **AIMS:** The primary aim of the study was to assess the difference in metal ions generated between the arthroplasty group (36mm MoM Pinnacle - Corail THA system) and resurfacing group (Birmingham & Cormet Hip Resurfacing). **METHODS:** Only patients that underwent the Pinnacle THA / Birmingham or Cormet Resurfacing were included. 93 patients that met these criteria. 46 had received a resurfacing prosthesis and 47 a total hip arthroplasty. **RESULTS:** It was found that the average Cobalt and Chromium level for the resurfacing group was 36.29 ppb and 21.41ppb and for the total hip arthroplasty group was 27.54 ppb and 18.01 ppb. There was a slightly higher level of cobalt ions in the resurfacing group (not statistically significant $p < 0.05$). Pain and the formation of pseudotumours were the most common causes of revision in both the groups. Both groups had 1 re-revision each. **CONCLUSION:** Our study has NOT shown selective elevation of Cobalt as a result of trunnion wear in the THA group which has been reported in similar studies.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 50805

SPICA MRI PREDICTORS FOR EPIPHYSEAL OSTEONECROSIS AFTER CLOSED REDUCTION TREATMENT OF DDH

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Background: Spica MRI with intravenous contrast after closed reduction of developmental dysplasia of the hip (DDH) is helpful to determine reduction and identify risk for osteonecrosis. The purpose of our study is to evaluate spica MRI predictors for osteonecrosis after closed reduction for DDH. Methods: Retrospective study for patients undergoing closed reduction for DDH followed by gadolinium enhanced spica MRI. Patient demographics and clinical information including the development of epiphyseal osteonecrosis and need for re-intervention were recorded. MRI data included hip abduction angles and percentage of femoral head enhancement. Results: 25 hips were included (mean age 0.99 years, range 0.4-3.1 years). Mean follow-up was 3±1.5 years (range: 0.65-6.1 years). 8/25 hips (32%) went developed osteonecrosis. Epiphyseal osteonecrosis was more likely with <80% enhancement (sensitivity 87.5%, specificity 88.25%, positive/negative predictive value 78% and 94% respectively). The mean contrast enhancement for hips developing osteonecrosis compared to those who did not was 37.5% and 86.5% respectively; p=0.001. The development of epiphyseal osteonecrosis was not statistically significant when the abduction angle was greater than 55 degrees (P=0.1). The odds of osteonecrosis was 9% lower with every 1% increase of perfusion. Three hips underwent re-intervention based on the immediate post-reduction spica MRI results. From this subset, one developed epiphyseal osteonecrosis. Conclusions: Immediate post-spica MRI with gadolinium is a useful prognostic tool for determining risk for epiphyseal osteonecrosis. Even in cases with partial epiphyseal enhancement, osteonecrosis may still develop. When epiphyseal enhancement is less than 80%, it is recommended that spica cast revision be considered.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 49835

TOWARDS A COMPREHENSIVE CLASSIFICATION OF ACETABULAR DYSPLASIA ALIGNED WITH SURGICAL TREATMENT

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Purpose: Aim of the study was application of a comprehensive dysplasia classification to find incidence of different types of acetabular dysplasia in symptomatic hips undergoing periacetabular osteotomy (PAO). Methods: This was a retrospective radiographic and chart review of 134 dysplastic hips with PAO by a single surgeon over a period of 11 years (2006-2016). Two fellowship trained observers independently used a validated software (Hip to Norm) to measure Lateral Centre Edge Angle (LCEA), Acetabular Index (AI), anterior coverage (AC), posterior coverage (PC) and retroversion signs. The comprehensive classification system was then used to classify these hips into predominant Anterior, Posterior or Global/Lateral deficiency groups. This previously proposed system classifies hips as laterally/globally deficiency if LCEA < 20 degrees or LCEA between 20-25 degrees with AI >10. Hips, not laterally deficient, were classified as anteriorly deficient if AC was less than 15% and as posteriorly deficient if PC was less than 36%. Results: There were 79 hips with lateral/global deficiency (59%), 50 hips with isolated anterior deficiency (37.3%) and 5 hips with isolated posterior acetabular deficiency (3.7%). Conclusions: The Comprehensive classification identified a significant number of dysplastic hips without lateral acetabular wall deficiency. We believe that these two patterns (anterior or posterior deficient only) can be easily missed if only LCEA measurements are used to define hip dysplasia. Also, this classification can potentially provide valuable guidance for surgical correction of underlying acetabular deficiency/instability. Further studies are needed to ensure that the system is valid and reliable before getting universally accepted.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 51901

HIP JOINT PRESERVATION SURGERY: DOES IT REALLY PRESERVE THE HIP JOINT AND PREVENT HIP ARTHROPLASTY? A REVIEW OF THE EVIDENCE

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Despite the success of Total hip arthroplasty (THA), when considering the 'young adult' with hip pathology, it is important to be aware of hip preserving surgeries that look to provide pain relief and restore function with the most commonly use being hip arthroscopy and periacetabular osteotomy (PAO). The aim of this study was to determine whether joint preservation surgery actually preserves the hip joint by reviewing papers examining conversion rates to THA following joint preservation surgery. A systematic review was undertaken using PRISMA guidelines. Mean follow-up of 36 months was a requirement for inclusion. When considering hip arthroscopy we found of 21 eligible papers; 5 systematic reviews and 16 studies. Out of the scientific studies there were 2,044 patients with 482 undergoing conversion to total hip replacement (23.6%). Regarding PAO, there were 26 scientific papers including 2,323 patients who underwent PAO with subsequent conversion to total hip replacement in 307 patients (13.2%). Certain features were associated with increased conversion to THA, including; increasing age, worsening arthritis and joint space <2mm. This review suggests that hip arthroscopy and PAO may be effective surgeries, but careful patient selection is crucial to successful outcomes. Despite the information gleaned from it, this review highlights the need for larger studies of longer duration to determine the effectiveness of joint preservation surgery at preserving the hip joint.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 52481

MAGNIFICATION OF HIP RADIOGRAPHS: CORRECTION FACTOR FOR OBESE PATIENTS

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Obese patients have a higher prevalence of total hip arthroplasty (THA) and they are likely to experience a higher rate of pre-operative and post-operative complications. Pre-operative templating is a standard method of THA planning aiming to minimize the risk of complications. The accuracy of pre-operative templating depends on the knowledge of radiographic magnification factor. Whether and to what extent obesity affects radiographic magnification is not well described in literature. The purpose of this study was to determine whether obesity type affects hip radiographic magnification and quantify the relationship between the obesity measured and change in radiographic magnification. Digital radiographs of 303 patients who underwent THA were taken from clinical archives. The size of implanted femoral head was taken as an internal calibration marker to estimate hip radiographic magnification. Patients were stratified into obesity categories by body mass index (BMI). Patients' mass, BMI, and body surface area (BSA) were studied as predictors of hip magnification. There is a significant effect of obesity type on hip radiographic magnification (one-way ANOVA, $p < 0.001$). The radiographic magnification correlates with patients' mass ($r = 0.443$, $p < 0.001$), BMI ($r = 0.450$, $p < 0.001$) and BSA ($r = 0.443$, $p < 0.001$). For every 17 kg increase in patients' mass, 5 kg/m² increase in the BMI. We recommend that 0.7 percent for males and 1.2 percent for females is added to the radiographic magnification estimated for normal-weight patients for each subsequent BMI obesity category in order to get more accurate radiograph magnification for preoperative planning.

Date: 2018-10-13

Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 51545

IS PARKINSON'S DISEASE ASSOCIATED WITH WORSE OUTCOMES FOLLOWING TOTAL HIP REPLACEMENT?

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Introduction: Although neurological conditions are widely accepted as a risk factor for worse outcomes following total hip replacement (THR), evidence to support this association is limited and variable. This study aimed to establish whether patients with Parkinson's disease (PD) had worse outcomes following THR in terms of risk of mortality or revision. Methods: Patients who underwent elective THR for primary osteoarthritis between 1999 and 2012 with PD (n = 490) were identified using datasets available through the Swedish Hip Arthroplasty Register (SHAR). A control group was generated, with 1:1 matching for additional risk factors and comorbidities. Risks of revision and mortality were compared at points over the 14 year study period, using Kaplan-Meier and Log-rank testing; p-values less than 0.05 were considered statistically significant. Results: Risk of mortality did not differ at 30 days or 1 year. At 9 years, mortality was increased for PD patients (p<0.001). Overall, mortality for PD patients was higher (p<0.001). Risk of revision did not differ at 30 days. At 1 year, revision was higher for PD patients (p<0.05). This difference was more pronounced at 9 years (p<0.005). Overall, a higher risk of revision was observed in the PD group (p<0.001). Discussion/Conclusion: Patients with PD had worse outcomes following THR, with increased risks of revision and long-term mortality. The increased risk of mortality might be principally due to the degenerative nature of PD. We believe our findings provide important context for arthroplasty surgeons when deciding to perform THR on PD patients.

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Room: Room 518a+b

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COMPARISON OF DIFFERENT ANTIBIOTIC PROPHYLAXIS REGIMES IN THE RISK OF EARLY REVISION FOR INFECTION FOLLOWING PRIMARY JOINT ARTHROPLASTY OF THE HIP AND KNEE

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Introduction: Administration of perioperative antibiotic prophylaxis (AP) reduces the risk of prosthetic joint infection (PJI) following primary total hip and knee arthroplasty. The optimal type of antibiotic and duration of prophylaxis are subject to debate. We compared the risk of revision surgery for PJI in the first year following THA and TKA compared to AP regimens. Methods: A national survey collecting information on hospital-level AP policy was conducted across the Netherlands and linked to data from the Dutch arthroplasty registry for 2011-2015. PJI status was defined using the surgical indication reported at revision by surgeons on the registry form. Restricted cubic splines Poisson model adjusted for hospital clustering were used to conduct the comparisons on 130,712 THAs and 111,467 TKAs performed in 99 institutions. These included 399 THA's and 303 TKA's revised for the indication of PJI. Results: Multiple doses of Cefazolin (MCZ), of Cefuroxime (MCX) and single shot of Cefazolin (SCZ) were respectively administrated to 87%, 4% and 9% of patients. For THA, the rates of revision for PJI were respectively 31/10,000 person-years (95%CI: 28-35), 39 (25-59) and 23 (15-34) in the groups that received MCZ, MCX and SCZ. The respective rates for TKA were 27 (24-31), 40 (24-62) and 24 (16-36). Conclusions: No evidence of differences between AP regimens was found in the unadjusted and adjusted model (age, gender, BMI and ASA grade). Further work is advocated to confirm whether there is an association between AP regimen collected at patient-level and the risk of subsequent revision for PJI.

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Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 51104

THE SPOUSAL PERSPECTIVE IN TOTAL HIP AND KNEE ARTHROPLASTY

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Advances in hip and knee arthroplasty have improved patient satisfaction after surgery. The demographics of arthroplasty patients are such that the primary caregiver is often the patient's spouse and their perspective and improvement in quality of life is generally overshadowed, or even overlooked. We undertook a study to determine the congruence of responses between the patient and their spouse regarding the patient's perceived pain and disability before and after surgery, and to measure the benefits of arthroplasty surgery for both the patient and their spouse. The patient and their spouse each responded to a questionnaire to quantify the patient's pain scores pre- and post-operatively, the patient's level of disability in activities of daily living, and to list five ways in which the surgery affected their quality of living. In total, 33 couples (66 respondents) were surveyed -17 male patients and 16 female patients. Patients reported lower pre (7.5 vs 8.2/10) and post-operative (0.9 vs 1.5/10) pain scores than their spouses. Overall, the patients and their spouses reported a significant improvement in their level of disability following the surgery in all aspects of daily living. The spouses noted that the arthroplasty significantly improved their quality of life because it resulted in their ability to resume their favorite leisure and sporting activities (69%), there was less suffering of their partner (61%), they were more independent and less need to be a caregiver (55%), they had an improved marital relationship (55%), it improved their social and family life (27%) and it allowed them to travel (27%). This is the first study to specifically address the benefits of arthroplasty for the patient's spouse. The improvements in mobility and pain allow patients to partake in activities with their spouse, which has a positive effect.

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Session: Hip Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 518a+b

Abstract no.: 50672

EFFECT OF EXTRAACORPOREAL SHOCK WAVE THERAPY IN SICKLE CELL DISEASE RELATED-HIP OSTEONECROSIS

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Background and Purpose: Sickle cell disease related-hip osteonecrosis is a progressive disease with significant morbidity and long term disability. Different modalities of treatment including both surgical and nonsurgical options have been used with varying levels of success. Extracorporeal shock wave therapy (ESWT) is a non-operative treatment option described for early-stage disease, however; exact indications have not been established yet. To the best of our knowledge, the use of ESWT for the management of sickle cell related-hip osteonecrosis has not been described. The aim of this study was to assess the effectiveness of ESWT in the treatment of osteonecrosis of the femoral head (ONFH) in sickle cell disease patients. Patients and Methods: Eighteen hips were included in this study. Pre- and post-operative clinical assessment utilizing VAS pain score and Harris hip scores were performed. Radiological evaluation using plain radiographs and MRI were performed pre- and post-operatively. Results: The overall clinical outcomes were improved in 60.6%, unchanged in 12.1% and worsened in 27.3%. Plain radiographs showed only 6.06% improvement, 78.78% remain unchanged while 15.1% were worsened. On MRI, the lesions showed progression in 4.7%, regression in 42.9% and were unchanged in 52.4%. Conclusion: Functional outcomes of sickle patients treated with ESWT for early ONFH appear to be effective although long-term results are needed to validate the efficacy of ESWT sickle cell related-hip necrosis.

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Session: Knee Free Papers (Revision)

Time: 10:30 - 12:00

Room: Room 519a+b

Abstract no.: 52724

**KEY NOTE LECTURE: STABILISING THE REVISION TKR
COMPONENTS: WHAT COMBINATION OF STEMS, CEMENT AND BONE
GRAFT WILL WORK?**

Tim WILTON

, . (UNITED KINGDOM)

Date: 2018-10-13
Session: Knee Free Papers (Revision)
Time: 10:30 - 12:00
Room: Room 519a+b

Abstract no.: 52526

METAPHYSEAL FIXATION WITH CONES AND SLEEVES IN REVISION TOTAL KNEE ARTHROPLASTY: A SYSTEMATIC REVIEW

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Background: Revision total knee arthroplasty (TKA) often involves varying degrees of femoral bone loss that presents unique reconstructive challenges. Recently major tibial and femoral bone defects have been reconstructed using metaphyseal cones and sleeves. **Methods:** A systematic review of the literature according to the preferred reporting items for systematic reviews and meta-analyses guidelines was performed. A comprehensive search of PubMed, MEDLINE, Embase, and Google Scholar was conducted for English articles between 1998 and 2017 using combinations of the keywords “knee replacement”, “knee arthroplasty”, “knee revision”, “TKA”, “TKR”, “cone”, “tantalum”, “porous metal”, “sleeve”. **Results:** In all, 33 articles met our inclusion criteria. These included a total of 1764 total knees arthroplasties, which were divided into 2 groups: studies dealing with tantalum cones (733 knees) and those dealing with titanium sleeves (1031 knees). Amongst tantalum cones the mean aseptic loosening rate was 1.35% at a mean follow up of 42 months, with a mean survivorship of 98.6% considering aseptic loosening as the endpoint. Within metaphyseal sleeves the mean aseptic loosening was 1.27% at a mean follow-up of 47 months, and a mean survivorship with aseptic loosening as endpoint of 98.7%. **Conclusions:** The available data showed that cones and sleeves represent a viable option for surgeons when dealing with severe bone loss during revision TKA. These devices showed excellent fixation and good clinical outcomes at mid-term follow-up. Long-term analysis and comparative study are needed to determine whether these reconstruction methods will provide superior long-term clinical success.

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Session: Knee Free Papers (Revision)

Time: 10:30 - 12:00

Room: Room 519a+b

Abstract no.: 52164

CONSTRAINED TOTAL ARTHROPLASTY IN POST TRAUMATIC KNEE: A SERIES OF 21 CASES

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Objective: To describe a series of constrained total knee arthroplasty in posttraumatic sequelae. Materials and methods: Retrospective descriptive study of patients operated with constrained prostheses between 1998 and 2016, by same surgical team, with posttraumatic sequelae due to intraarticular fractures and multiligament knee injuries. Patients with incomplete imaging studies were excluded. Demographic variables, prosthetic design, time between injury and arthroplasty, complications (infection, loosening), range of mobility and work reinstatement were recorded. Results: Twenty-one patients (21 knees), with a mean age of 56.7 years at the time of surgery and a mean follow-up of 43 months (6-144) were included. Most frequent traumatic history was the intraarticular proximal tibia fractures (7 cases), followed by the intraarticular distal femur fracture (5), multiligament knee injuries (4) and 1 case of floating knee. Constrained arthroplasty was performed on average 6.4 years post trauma as a primary arthroplasty in 12 patients and as a revision in 9. Three resulted infected (all primary), 2 were rescued and 1 required amputation. There were no signs of radiological loosening and the range of average mobility was 0° of extension and 103° of flexion. Only 11 patients achieved a total or partial work reinstatement at 43 months average (6-144) and 1 died from other complications. Conclusion: Primary or revision constrained arthroplasty is a therapeutic option in the treatment of post-traumatic knee osteoarthritis with satisfactory results. However it presents higher incidence of complications.

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Room: Room 519a+b

Abstract no.: 51792

DIAGNOSTIC ACCURACY OF INTERLEUKIN-6 AND PROCALCITONIN IN PATIENTS WITH PERIPROSTHETIC JOINT INFECTION

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It remains unclear whether these biomarkers are clinically useful in ruling out PJI. In this meta-analysis, we reviewed studies that evaluated IL-6 or/and PCT as a diagnostic biomarker for PJI and provided sufficient data to permit sensitivity and specificity analyses for each test. We identified 18 studies encompassing a total of 1,835 subjects; 16 studies reported on IL-6 and 6 studies reported on PCT. The area under the curve (AUC) was 0.93 (95% CI, 0.91 to 0.95) for IL-6 and 0.83 (95% CI, 0.79 to 0.86) for PCT. The pooled sensitivity was 0.83 (95% CI, 0.74 to 0.89) for IL-6 and 0.58 (95% CI, 0.31 to 0.81) for PCT. The pooled specificity was 0.91 (95% CI, 0.84 to 0.95) for IL-6 and 0.95 (95% CI, 0.63 to 1.00) for PCT. Both the IL-6 and PCT tests had a high positive likelihood ratio (LR); 9.3 (95% CI, 5.3 to 16.2) and 12.4 (95% CI, 1.7 to 89.8), respectively, making them excellent rule-in tests for the diagnosis of PJI. The pooled negative LR for IL-6 was 0.19 (95% CI, 0.12 to 0.29), making it suitable as a rule-out test, whereas the pooled negative LR for PCT was 0.44 (95% CI, 0.25 to 0.78), making it unsuitable as a rule-out diagnostic tool. In conclusion, IL-6 has higher diagnostic value than PCT for the diagnosis of PJI. Moreover, the specificity of the IL-6 test is higher than its sensitivity. Conversely, PCT is not recommended for use as a rule-out diagnostic tool.

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Session: Knee Free Papers (Revision)

Time: 10:30 - 12:00

Room: Room 519a+b

Abstract no.: 51097

THE KNEE MEGAPROSTHESIS: A 43-CASE REPORT

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Introduction: to face the reconstruction after bone tumor resection at the knee, we use the megaprosthesis locking or not, for improve the function Methods: we report 43 cases of reconstruction at the knee; the patients are between 17 and 38 old. The distal part of the femur was resected in twenty five patients and the proximal part of the tibia in eighteen patients. Results: the median duration of follow-up was seventy months. Twelve megaprosthesis are put in first intention, and thirty one are put in second intention. ; the antirotation pin appeared to have good mechanical benefits for us, mostly after revision. The reconstructions was performed with locking , sixteen patients in first intention and five after revision. Discussion: average postoperative of the Musculoskeletal Tumor Society Scoring was 23/30. The complications warranting implant revision surgery were documented in 15% of patients. The limb salvage rate was 83% overall patients survival was 79% at 5 years and 71% at 10 years.

Date: 2018-10-13
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Abstract no.: 52266

PLACEBO EFFECT IN CARPAL TUNNEL SYNDROME TREATMENT

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The placebo effect has been recognized to significantly modulate the response to active treatments, but this effect has not been quantified. We conducted a double blinded prospective study comparing palmitoylethanolamide (PEA) against placebo in cases of low grade or mild CTS. During 2 months, 68 patients were given 300mg of PEA twice a day or two tablets of placebo. A clinical study was recorded for each patient before and after treatment, together with an EMG study. The results showed an improvement of clinical data in both groups with no statistical differences. The positive effect of placebo was surprising in this study and we intend to quantify it. 31 patients received placebo for two months and were evaluated clinically. Their mean age was 53.32 years (± 13.43) and BMI 28.85 (± 4.84). Before treatment, average symptoms severity score (SSS) of the Levine questionnaire scored 2.57 (± 0.74) and the functional status score (FSS) 2.24 (± 0.66). After treatment, they decreased to 2.11 (± 0.81) and 1.96 (± 0.77), statistically non-significant for SSS ($p=0.0865$) and significant for FSS ($p=0.0028$). Pain was also measured using a Visual Analogue Scale (VAS), and showed a non-significant decrease ($p=0.3407$). After placebo treatment, SSS, FSS and VAS improved 0.46, 0.28, and 0.81 points respectively, which can be expressed in percentage as 17.89%, 12.5% and 19.95%. We can conclude that the placebo effect could account for up to 20% of improvement in the conservative treatment of CTS in the measured items. This data can help maximize treatment outcomes in the clinical setting.

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Session: Miscellaneous Free Papers

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Room: Room 520a+b

Abstract no.: 52525

PATIENT-CENTRED CONSENT IN THE ELECTIVE SETTING: A CHANGE IN OUR PRACTICE

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As a result of the 2015 Montgomery versus Lanarkshire Health Board ruling, the guidance from the GMC and Royal Colleges has been to instruct clinicians to ensure the consenting process for elective surgery is tailored to the individual patient. The Royal College of Surgeons along with medical protection groups have issued recommendations in order to aid clinicians in their practice when consenting patients. Prospective data was collected through audit in our department via clinic letters and consent forms in order to assess compliance with these new guidelines for patients presenting to hospital for elective surgery. Several key areas of deficiency were highlighted and through a process of feedback and education within our department, a clinic letter protocol was developed and distributed to members of the department based on the Royal College and protection society recommendations. A re-audit of our consenting process was performed 7 months later following the intervention introduced above. Overall, post intervention, improvements were noted in the quality of documentation, including listing of surgical options (66 to 98%), general risks (40 to 77%), and inclusion of information booklets in patient notes (6 to 76%). We introduce an innovative approach to ensuring the consenting process adopted for elective joint replacement surgery in our department is patient-centred and in line with new guidance helping to ensure this process is medico-legally robust.

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Abstract no.: 52013

DUAL MOBILITY CUP AND GROIN PAIN: A PROSPECTIVE MULTICENTRE SERIES OF 548 CASES AT A MEAN FOLLOW-UP OF FIVE YEARS

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Introduction: Groin pain is a cause for total hip arthroplasty (THA) revision; the rate ranges from 0.4% to 26%. No publication reports this event when using Dual Mobility Cups (DMC). Purpose of this study was to evaluate occurrence of this complication and revision in a prospective series of 548 cases of DM at 5 years. Material and methods: From May 2012 to December 2013, 548 patients were operated on with a DM THA. 24 (5%) patients died (unrelated to the THA) 16 (3%) were lost to follow up. We identified patients complaining with significant groin pain (PMA score < 3 or HHS pain marked- disabled). Major revision and minor revision were analysed. Qualitative variables were presented as percentage, quantitative variables as mean and range. Results: Mean age of the patients at surgery was 71.17year (Sd10.45:36-98). 63% were female. Diagnoses were osteoarthritis (479;87%), post traumatic arthritis (9;2%), hip dysplasia (19;3%), aseptic necrosis (36;7%) rheumatoid arthritis (5;1%). A postero lateral approach was used in 458 (84%) cases, antero-lateral (Hardinge) in 90 (16%) cases. 5 (0.9%) patients complained with significant groin pain at more than 1 year. 3 (0,5%) were revised with a cup replacement at 12 and 18 months post op. 2 patients still have groin pain but have not been revised. Discussion: Groin pain rate varies from 0.4% to 26 % according to major national registries (Swedish, New Zealand, England and Wales, Australian). No publication reports the rate of groin pain and revision in DM. Epinette et al. reported 3 cases with pain (not revised) among 325 DM. Guicherd et al. reported on a multicentre series of 64 cases of arthroscopic release of the ilio psoas tendon in THA (21% were DM). Conclusion: According to our results we would suggest that.

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Abstract no.: 51875

THE INHIBITORY EFFECTS OF TACROLIMUS ON GLIOSTATIN PRODUCTION IN RHEUMATOID ARTHRITIS SYNOVIOCYTES

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Introduction: Gliostatin (GLS) is known to have angiogenic and arthritogenic activities. To determine the inhibitory effects of tacrolimus (TAC) on GLS production in RA, we investigated the modulation of serum GLS by TAC therapy and the effect of TAC on the production of GLS in cultured fibroblast-like synoviocytes (FLSs). Methods: Serum samples were collected from eleven RA patients with active disease at baseline and after 12 weeks of TAC treatment. RA patients had a history of unsatisfied response with at least one csDMARD or biological DMARD. Serum concentrations of GLS and matrix metalloproteinase (MMP)-3 were measured by enzyme immunoassay (EIA). Synovial specimens were obtained from RA patients of total knee arthroplasty. FLSs were stimulated by TNF alfa with or without TAC. The expression levels of GLS were determined using RT-PCR and EIA, and MMP-3 protein was measured by using EIA. Results: Six patients fulfilled good and moderate responder and the other five patients fulfilled no responder with EULAR response criteria. DAS28, serum GLS, CRP and MMP-3 were significantly down-regulated in TAC responders. In RA FLSs, GLS mRNA and protein were significantly induced after treatment with TNF alfa alone (GLS mRNA 21.9-fold, protein 1.5-fold). These inductions were suppressed by TAC in a dose-dependent manner. MMP-3 protein was induced by TNF alfa and was similarly suppressed by TAC in a dose-dependent manner (MMP-3 protein 2.9-fold). Conclusions: The beneficial effect of TAC in RA might be due to, at least in part, to anti-angiogenic and anti-arthritogenic activity following the down-regulation of GLS.

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Room: Room 520a+b

Abstract no.: 50522

SYNOVASURE ALPHA-DEFENSIN IS UNRELIABLE IN THE DIAGNOSIS OF LOWER LIMB PERIPROSTHETIC JOINT INFECTION: A BRITISH TERTIARY REFERRAL CENTRE EXPERIENCE

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Background: Periprosthetic joint infection (PJI) is a major complication of total joint arthroplasty. Establishing a prompt diagnosis is essential but often challenging as the clinical presentation of PJI varies. Currently no gold standard test is available for the detection of PJI. Synovasure, an alpha-defensin lateral flow assay has shown promise in the intraoperative detection of PJI. The purpose of this study was to evaluate the diagnostic accuracy of Synovasure in detecting or excluding PJI. Methods: Patients undergoing revision hip or knee arthroplasty were retrospectively reviewed in a single tertiary revision arthroplasty centre between 2014 and 2017. Synovasure was performed on patients with a chronically painful prosthesis undergoing joint aspiration for diagnosis or during revision surgery. 37 patients were identified comprising 19 total hip arthroplasties and 18 total knee arthroplasties. Synovasure test results were compared to laboratory tissue sample analysis sent intraoperatively. Results: The synovasure test achieved an overall sensitivity and specificity of 36% and 77% respectively. The overall positive and negative predictive values were 40% and 74% respectively. For total hip arthroplasties, synovasure displayed a sensitivity of 43% and specificity of 75%, with a positive predictive value of 50% and negative predictive value of 69%. For total knee arthroplasties, synovasure displayed a sensitivity of 25% and specificity of 79% with a positive predictive value of 25% and negative predictive value of 79% respectively. Conclusions: This study illustrates a limited ability of Synovasure to reliably detect or exclude PJI during lower limb revision arthroplasty.

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Room: Room 520a+b

Abstract no.: 52535

REVIEW OF ORTHOPAEDIC IMPLANTS AND AIRPORT METAL DETECTORS AT A TIME OF INCREASED TERROR FEARS

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Introduction: The number of patients living with orthopaedic implants such as hip and knee arthroplasties is rapidly increasing.(1) Terrorist threat levels are growing with airport security levels tightening to match this threat(2) .This has led to an increase in patient concern regarding whether their orthopaedic implants will set off airport metal detectors. Aim: i. Review the relevant literature both pre and post-9/11. ii. Establish if implants are routinely detected and which factors affect how detectable an implant is. iii. Review major security/border agency protocol for airport scanners iv. Establish if a consensus exists for advice to be given to patients. Methods: The authors performed a Pubmed search combining title word searches of 'metal' or 'implant along with 'airport' or 'security'. The search yielded 43 articles and the abstracts were assessed for suitability. This left 13 appropriate articles. Results: The literature is inconsistent regarding which orthopaedic implants trigger airport metal detectors. However, recurring features that trigger the alarms include cobalt - chrome content and having multiple orthopaedic implants. Conclusion: We conclude that implant cards, radiographs, letters and so on detailing the implant are not required to be issued by the surgeon as security agencies will follow their individual set protocols.

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Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 52088

LIMB SPARING IN DOGS USING PATIENT-SPECIFIC ENDOPROSTHESES AND CUTTING GUIDES: DESIGN, MANUFACTURE AND PRELIMINARY VALIDATION

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Limb sparing is performed in dogs afflicted by primary bone tumors of the appendicular skeleton. The most common anatomic site is the distal radius. Several techniques have been described, however, they generally remain time-consuming with a high rate of complications. There are three main complications related to limb sparing surgeries: implant or bone failure, local recurrence, and infection, which is the most common. The principal objective of this project was to develop and validate the concept of limb sparing surgery in cancer-afflicted dogs using a personalized 3D-printed patient-specific endoprosthesis (PE). This approach would potentially decrease operative time in an attempt to reduce complications. CT-scan was performed on both affected and normal thoracic limbs, and a 3D-reconstruction was used to design a cutting guide (CG) and personalized endoprosthesis. The latter used a mirror image of the normal contralateral radius, and a patient-specific contoured plate, both combined in a single implant. The PE was manufactured from Ti6Al4V powder using a commercial laser powder bed fusion system, while the CG was 3D printed from ABS plastic using a commercial fused deposition modelling system. Several post-processing steps were undertaken. Total turnover time ranged from 65 to 85 hours. Such endoprostheses were first implanted in an amputated limb as a proof of concept, then successfully in 5 client-owned dogs. In conclusion, we confirm the feasibility of this approach thus validating the use of this technology. We are pending the results of an ongoing clinical trial.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 52168

DON'T SHOOT THE MESSENGER: DEVELOPMENT OF CRITERION AND SYSTEMATIC REVIEW OF MESSENGER APPS IN HEALTHCARE

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Background: Increasing use of smartphones has seen the use of mobile applications rise in healthcare. Healthcare professionals (HCPs) have been warned against using Whatsapp. Governance and Caldicott principles are at risk. European General Data Protection Regulation (GDPR) comes into effect from May 2018 and organisations not complaint would be fined. Objective: Systematic review of health messenger applications (HMA) and Assessment of medical communication in Orthopaedic Department. Method: Searches for HMA were conducted on Google Playstore and Apple Appstore which were ranked. HMA were stratified against 5 criteria: End-to-end encryption, cloud photo storage, HMA pin code protection, user verification, temporal message storage. Stratification with ranking/downloads applied. HCP's completed a survey. Results: Questionnaire: 85.7% use smartphones; 98.7% have password protection; 58.4% have patient related images/information on cloud photo storage; 55.8% possible insecure patient data on phone; 33.7% messenger app password protection; 45.5% active cloud storage; 32% accidental viewing of information. 251 apps were found with initial search. 26 HMA fulfilled criteria with stratification showing 5 HMA. 6 known messengers identified in medical literature included although failed criteria. 2 apps fulfilled the criteria: Siilo, Hospify. Conclusion: There is significant data breaching potential where the majority of HCPs use smartphones the hospital setting. The current literature has denounced popular Messengers such as Whatsapp and Facebook messenger for GDPR reasons and do not fulfil our 5 criteria. We have discovered 2 HCM worth further investigation where further research is required.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 51916

USING XR TECHNOLOGY TO IMPROVE SURGICAL DECISION-MAKING UNDER PRESSURE

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Over 60% of surgeons report lack of confidence when making critical decisions under pressure. Recent technology advancements allow smartphones to be converted into immersive, virtual reality headsets. We have developed the Virti platform which uses 360 interactive technology to immerse and assess a surgeon in real-world scenarios to improve decision-making under pressure before they are actually enter the operating theatre. A pilot research study took 75 participants and used 5 different training methods to teach them acute surgical decision-making. Each group was provided 20 minutes of training via their designated training method. After which they were asked to rank their confidence to perform the technical steps of managing a real patient, their enjoyment of the teaching method and their confidence to perform this skill in a real environment under pressure. VR FIITT scored highest in all three areas of assessment compared to the other teaching methods. Participants enjoyed the VR FIITT (P=0.028) and had more confidence to use their skills in clinical practice (P=0.045) compared to all other teaching methods. However it was only shown to be superior to Video and textbook teaching methods (P=0.036) when assessing how confident students felt with the steps of patient management. The nature of critical decision-making is a main factor in why surgeons feel underprepared to attend trauma calls and acutely unwell patients. This project highlights this technology can be used to address this issue. By helping to reduce anxiety, and potentially improve performance, when faced with these events in real life.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 50794

SAFETY AND ACCURACY OF ROBOT-ASSISTED VERSUS FLUOROSCOPY-ASSISTED PEDICLE SCREW INSERTION IN THORACOLUMBAR SPINAL SURGERY: A PROSPECTIVE RANDOMISED CONTROLLED TRIAL

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Aim: To compare the safety and accuracy of the TiRobot system-assisted with conventional fluoroscopy-assisted pedicle screw placement in thoracolumbar spinal surgery. **Method:** 257 Patients suffering from thoracolumbar spinal disease were randomly assigned to robot assisted group (RG) or fluoroscopy assisted group (FG). The primary outcome measure was accuracy of screw placement based on the Gertzein-Robbins scale. Grades A and B (<2 mm pedicle breach) were considered clinically acceptable. Further, the discrepancies between the surgeon's plan and the actual placements were also measured in RG. Secondary parameters included proximal facet joint violation, duration of surgery, length of hospital stay and radiation exposure. **Result:** In RG, 95.2% screws had perfect positions (Grade A). The remaining screws were graded B (3.4%), D (1.4%). In the fluoroscopy group, 86.1% screws had perfect position (Grade A). The remaining screws were graded B (7.1%), C (4.6%) and D (2.2%). The proportion of acceptable screws was higher in RG compared with FG ($P < 0.05$). In RG, the mean deviation was 1.53 ± 3.21 mm for each screw. None of the screws in RG violated the proximal facet joint, compared with 34 screws (8%) in FG ($P < 0.05$). Surgical time for screw placement was significantly shorter in FA compared with RA ($P < 0.05$). Blood loss was lower in the RG than in FG ($P < 0.05$). There was no significant difference in radiation exposure and postoperative hospital stay between two groups. **Conclusion:** Robot-guided pedicle screw placement is a safe and useful tool for thoracolumbar spinal surgery.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 50903

AUTO-REGISTRATION HAS BETTER CLINICAL ACCURACY THAN POINT-TO-POINT REGISTRATION USING AN ACTIVE INFRARED NAVIGATION SYSTEM IN LUMBAR SPINAL SURGERY

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Aim: To measure and compare the clinical accuracy of point-to-point registration (PR) and auto-registration (AR) in an operative set using an active infrared navigation system. **Methods:** A novel method was used to measure the clinical accuracy of the navigation system under an operative set using a Sawbone model with titanium beads on the surface, which was essential to measure the accuracy numerically, instead of a real patient. Both the operative set and the procedure mimicked a regular surgery. We define the average distance between the “navigation coordinate” and the “image coordinate” as the clinical accuracy. The clinical accuracy of PR using preoperative CT images and AR using intraoperative CT images was measured and compared. **Results:** The average clinical accuracy of PR varied in different segments. The accuracy of the most accurate segment was 1.10mm, which was the reference segment, namely the vertebra that provided the reference points during PR. In the two segments adjacent to the reference segment, the clinical accuracy deteriorated to 1.37 mm and 1.50 mm. The accuracy of the farther segments were worse. In comparison, in AR group, there was no significant difference in the clinical accuracy compared among different segments. The average accuracy of AR was 0.74 mm, which was significantly better compared with the best accuracy of PR. **Conclusion:** AR is better than PR with respect to clinical accuracy in navigation assisted spinal surgery.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 50720

THE ROLE OF COGNITIVE SIMULATION IN ORTHOPAEDIC EDUCATION: THE ADVENT OF MOBILE APPLICATIONS

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Background: Simulation provides a safe environment, for trainees to learn, maximizing learning in a time where working patterns are limiting training. The expansion of simulation as a teaching tool has led to innovation in cognitive simulation applications. The evidence regarding the value and transferability of the learning from these applications is however, scarce. We aim to ascertain the value and current role of cognitive simulation from a trainee perspective, to improve surgical training. Methods: We conducted a prospective study of trainee perceptions during junior orthopaedic training. A structured questionnaire was designed and modified after piloting with local trainees. Qualitative and quantitative data was analyzed using statistical frequency analysis and thematic analysis respectively. Results: A representative cohort of trainees participated, with a 58.3% return rate. Touch surgery represented the predominant cognitive simulation application used (42.9%). The overriding theme (85.7%) being that applications form an adjunct to traditional learning, specifically pre-operatively, with an average to good transferability to clinical practice. Thematic analysis highlighted the pre-operative value of cognitive simulation in review of surgical techniques, and skill development. Discussion: Understanding how trainees value and utilize cognitive simulation applications is essential to improving training. These results expand upon the established evidence regarding simulation to include cognitive simulation applications. Trainees are using cognitive simulation pre-operatively, re-enforcing intra-operative learning; a potentially powerful tool for trainers to engage with, allowing optimization of limited learning opportunities. Conclusion: Through adoption of these applications, trainers can tailor individualized learning to specific operative opportunities, enabling trainees to maximize intra-operative learning.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 50735

ROBOT-ASSISTED INTERNAL FIXATION IN CERVICAL SPINAL SURGERY: A RANDOMISED CONTROLLED STUDY

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Cervical spine has large anatomical variations, and the adjacent important organs such as spinal cords, oblongata, vertebral artery and nerve roots make the internal fixation for cervical spinal surgery a huge challenge. Misplacement of internal fixation may lead not only to an instability of the screws, but also to neurological, vascular, and visceral injuries. In this randomized controlled study, the TianJi Robot was used to improve the safety and accuracy of internal fixation for cervical spinal surgery compared with free hand technique. 62 patients were involved, and 212 screws were smoothly implanted without intraoperative complications. In robot-assisted surgery group, 101 of 103 screws (98.1%) were safely placed (<2 mm cortex breach) in 30 patients, and the mean deviation between the planned trajectory and the actual path is 1.12 +/- 0.72mm. In the free-hand surgery group, 103 of 109 screws (94.5%) were safely placed (<2 mm cortex breach) in 32 patients, and the mean deviation between the planned trajectory and the actual path is 1.50 +/- 0.98mm. There was no statistical difference in Gertzbein-Robbins classification distribution between these two groups (P value = 0.97), however, the discrepancies between the actual path and planned trajectory in this two groups have statistical difference (P value = 0.0013). The results demonstrated that robot assisted internal fixation increases safety and accuracy in cervical spinal surgery, which will have expanded applications in future spinal surgery.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 52544

A NEW INJECTABLE THERMOGELLING POLY-D-GLUCOSAMINE/D-GLUCOSAMINE CARBONATE SYSTEM AS A TISSUE REPAIR SCAFFOLDING HYDROGEL

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Injectable thermo-gelling Chitosan systems were first proposed in 2000 with the Chitosan/Glycerophosphate (C/GP) aqueous system. Such thermo-gelling systems have elicited much interest in recent years for biomedical applications such as tissue engineering and cell encapsulation matrices, and for tissue repair such as in articular cartilage defects. In this abstract, a novel Poly-D-Glucosamine/D-Glucosamine Carbonate (PG/GC) hydrogel-forming aqueous system is proposed as a new injectable thermo-gelling biopolymeric system. The PG/GC system is reconstituted by admixing the Poly-D-Glucosamine solution with two buffering solutions (D-Glucosamine, Carbonate) to form an injectable hydrogel-forming composition. The resulting PG/GC system showed a very fast rheological gelling kinetic at +25°C to +37°C, with rheological gelling rate within 1 minute, but the PG/GC system has a longer flowing state thus being injectable for 5-6 minutes. Once gelled, the PG/GC system formed solid bio-adhesive homogeneous hydrogels, reaching storage moduli (G') above 5000 Pa. Under unconfined compression, PG/GC hydrogels showed good mechanical properties the compressive Young's modulus in at 35-40kPa at 50% deformation. The PG/GC composition showed a non-toxic/biocompatible profile (cytotoxicity, irritation, mutagenicity, skin sensitization, acute systemic toxicity, ovine femoral chondral defect) and was totally bio-absorbed within 6 months. Human intervertebral disc cells encapsulated and cultured within the PG/GC hydrogels showed good survival. Encapsulated Mesenchymal stem cells (MSCs) were induced to differentiation into chondrocytes. The Poly-D-Glucosamine/D-Glucosamine Carbonate (PG/GC) thermo-gelling systems may prove to be a new and very performant Chitosan-derived scaffolding materials for stimulating natural cartilage healing when combined with classical arthroscopic cartilage-repair techniques.

Date: 2018-10-13

Session: Emerging Technology Free Papers

Time: 10:30 - 12:00

Room: Room 521a+b+c

Abstract no.: 49701

THE ROLE OF ARTHROSCOPIC SIMULATION IN TRAINING AND TEACHING SURGICAL SKILLS: A SYSTEMATIC REVIEW

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Background: Following the introduction of the European Work Time Regulations (EWTR) along with existing concerns over the non-uniform nature of the traditional apprenticeship model. An alternative method for teaching surgical skills is being sought. Simulation training offers a safe and standardised environment to perfect surgical skills. This study aims to review the most recent research into the utility of simulators in the specific area of arthroscopy. Then by assimilating this into existing research we hope to create a contemporary review of the role for arthroscopic simulators in training and teaching the surgical skills. Methods: A systematic review of Medline, Embase and Cochrane Library databases for English language articles dated between 2014 and November 2017 was conducted. Search terms included; “arthroscopy” or “arthroscopic” with “simulation” or “simulator”. Results: A total of 27 relevant articles were identified simulating ankle, knee, shoulder, hip and simple box arthroscopic environments. The majority of these studies demonstrated construct validity, while a few demonstrated transfer, face and content validity. Conclusions: This review suggests a considerable evidence base for a number of arthroscopic simulators with the emergence of a potential framework for their implementation in formal training. Further work should aim to standardise a simulation based curriculum in which to implement in larger scale multi-centred trials with longer follow up. Level of Evidence: IV, this review contains articles of level I-IV evidence.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 49684

THE EXPERIENCE OF A MAJOR TRAUMA CENTRE IN THE MANAGEMENT OF COMPARTMENT SYNDROME DUE TO BODY WEIGHT CRUSH INJURY

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Body weight crush injury (BWCI) is a type of compartment syndrome. It is caused by prolonged extrinsic pressure on an osseofascial compartment from dependency and immobility. The severity of the condition as a result of a crush is often related not only to the severity of the crush itself but also the duration and amount of muscle affected. Over a 5-year period 11 patients were admitted to our unit with BWCI. 2 died, 5 required one or more amputations and 4 were managed with fasciotomies. We found the early treatment of BWCI to be challenging and discuss a number of these. BWCI is difficult to assess surgically and expedient surgical management is required. Muscle can often appear contractile at the initial debridement as the outer fibres of the muscle body are yet to be affected but at further theatre visits necrosis develops in muscle that initially appeared healthy. Persistently raised or rising CK levels correlated with significant findings of necrosis and surgical exploration. As such CK has a role in the monitoring and development of the condition, in addition to lactate and metabolic acidosis. Infection is a severe complication for crush injury patients. Whilst our case series has no cases of infection as a complication, crush injury patients are well documented in the literature to be at a high infection risk. Therefore, reduction of this risk is a key part of management. Our series demonstrates the severity and complexity of the condition and demonstrates the difficulties in its management.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 51931

A PLEA TO REVIVE THE LOST ART OF NONOPERATIVE TREATMENT OF FRACTURES

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Orthopaedic Surgery has made huge strides in the last few decades and the treatment protocols for a said injury are fairly standardised and uniform. Unfortunately, the healthcare facilities, accessibility, and training facilities for surgeons across the globe are far from uniform. In arriving at a decision on the management plan of an injury, the patient's expectations, lifestyle, socioeconomic status are perhaps equally important as that of the surgeon's preference, if not more. Even today, the fracture healing process is natural and our interventions are mainly to aid nature, not override it. Even today, many fractures can still be managed non - operatively with satisfactory results. Unfortunately, non-operative treatment is a lost art, often it is simply not considered especially by enthusiastic young surgeons who have never been taught about that option. Sometimes a badly operated fracture fares far worse than one not operated. This presentation will be about fractures and situations which still can be managed non-operatively with fairly satisfactory results. This is of utmost importance in third world countries where patients finance their own treatment and often land in the hands of quacks because of the prohibitive costs of surgery. Lastly, the word "conservative" should be replaced with "non-operative" because the former suggests a suboptimal/substandard method which is not always true.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 49630

BONE MINERAL DENSITY MEASUREMENT IN TRAUMATIC DISTAL END RADIUS FRACTURES

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Introduction: Osteoporosis is a global problem affecting over 200 million people worldwide. Around 20% patients experience a second fracture within 1 year of the first fracture. Early diagnosis of osteoporosis and its treatment after a fragility fracture are therefore very important interventions that can help in reducing the socio-economic burden of osteoporosis. We present a case control study of bone mineral density in 100 cases of distal end radius fractures and age - sex matched controls. Materials and method: 100 patients with distal end radius fracture and 100 age - sex matched controls were selected based on pre- determined selection criteria. All selected individuals were investigated for serum calcium, vitamin D and alkaline phosphate. Bone mineral density was measured at 2 sites: calcaneum and distal radius. Data analysis was done to determine the strength of association between various parameters and bone mineral density in cases and controls. Result: The prevalence of osteoporosis was higher in age > 45 yrs (35%) as compared to age <45 yrs (8%). Osteoporosis was higher in females (65%) with Distal radius fractures compared to males (33%). There was a significant association between Serum Vitamin D, alkaline phosphatase and BMD. Presence of distal radius fracture (39%) had a significant association with osteoporosis as compared to controls (17%). Conclusion: There is a significant association between increasing age, female sex, Vitamin D deficiency, High alkaline phosphatase, presence of Distal radius fracture and osteoporosis. Key words: Osteoporosis, Bone mineral density, Vitamin D, distal end radius fracture.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 49643

THE EFFICACY OF FASCIA ILIACA BLOCK IN GERIATRIC HIP FRACTURE PATIENTS: A RETROSPECTIVE MATCHED CASE CONTROL STUDY

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Objective: Hip fractures are common orthopaedic injuries in the elderly. Opioids are commonly used for peri-operative pain relief in hip fracture patients, but they have numerous side effects which may lead to complications in the elderly. Nerve blocks such as the Fascia Iliaca Block (FIB) are gaining popularity as a peri-operative analgesia modality. We compare the efficacy of FIB on peri-operative pain relief, opioid usage and early rehabilitation goals in geriatric hip fractures patients. Methods: In this retrospective matched case control study, 40 elderly patients with hip fractures who had received the FIB from Nov 2014 to April 2016 were matched with a 1:3 ratio with similar patients whom had not received the FIB from our hip fracture database. Results: A total of 157 patients in both the FIB group (N=40) and the control group (N=118) were studied. The post-operative pain scores and total opioid consumption in the FIB group were significantly less than that of the control group ($p < 0.0001$ respectively). The complications in the FIB group were comparable with the control group ($p = 0.62$). However there were no significant differences between time taken to ambulate 10m ($p = 0.0308$) and length of hospital stay ($p = 0.0306$) between the 2 groups. Conclusion: The FIB provides effective post-operative pain relief and a decrease in opioid usage without an increase in complication rate in the elderly with hip fractures and should be considered as an effective modality of analgesia in all geriatric hip fracture patients.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 52347

EVALUATION OF OUTCOME MEASURES IN GUSTILO AND ANDERSON TYPE 3A AND 3B OPEN INJURIES OF TIBIAE BY THE GANGA HOSPITAL OPEN INJURY SEVERITY SCORE

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Systematically classifying fractures assists clinicians and researchers in communicating information by grouping injuries with similar characteristics and separating dissimilar injuries. Most widely used has been the system of Gustilo and Anderson. Open type 3B group of injuries includes a wide spectrum ranging from the easily manageable to almost unsalvageable. The management and prognosis prognosis of these injuries are highly variable making this classification too generalised, non specific and not much of use in prognostication. So to prognosticate Ganga Hospital Injury Severity Score is proposed. A total 106 open injuries of legs were treated. Of them, 77 consecutive patients with Type 3A and 3B injuries of tibia formed the study group. Initial evaluation was done by following the guidelines of Advanced Trauma Life Support. During the physical examination special attention was paid to the neurovascular examination, status of the compartments and the extent of soft-tissue injury and contamination. After debridement it was graded by Gustilo & Anderson classification, those which comes under Type 3A & 3B were included in our study and these were further classified by Ganga Open Injury Severity Score. amputation was done if score was >17, limb salvaged when score was <14. The scores of 15 & 16 constituted a grey area where the decision to amputate called for considerable experience. The final score was <5 in 6 patients, between 6 & 10 in 40 patients, between 11 & 15 in 29 patients and >15 in 2 patients.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 51657

IS OSSEOINTEGRATION THE DEFINITIVE ANSWER TO AMPUTEE RECONSTRUCTION?: EXAMINING THE COMPLICATION AND RE-OPERATION RATES AFTER OSSEOINTEGRATED RECONSTRUCTION

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Osseointegration has emerged as a promising alternative to rehabilitating with a traditional socket mounted prosthesis. A major concern of the osseointegrated approach lies in the risk of infections occurring from the permanent transcutaneous opening often referred to as the stoma. The objective of this study is to look into the rate of occurrence of all subsequent complications requiring a re-operation after a patient receives osseointegration surgery to provide a realistic evaluation on the effectiveness of the treatment and reveal any hidden underlying complexities. An analysis has been performed on all osseointegration surgeries performed by the Osseointegration Group of Australia between since 2010. All events leading to a readmission and subsequent re-operation have been identified through hospital operation records and pooled together for meta-analysis. Among all cases, there were a total of 130 re-operation events recorded which occurred among 66 patients, indicating a high recurrence rate among the same patients. We recorded a total of 29 debridements, 29 neurectomies, 43 soft tissue refashions, 22 implant revisions and 7 periprosthetic fracture fixations. Interestingly, the rate of debridements and soft-tissue refashions were found to be reduced for patients who were operated using a single stage surgery. In this study, we identified several addition possible reasons in which an osseointegration patient may need to be re-admitted into hospital for additional surgery. Through the implementation of improved surgical techniques and rehabilitation protocols, the rate of several of these re-operation events can be largely reduced, thus improving the overall outcomes of patients undergoing osseointegration surgery.

Date: 2018-10-13

Session: Trauma Free Papers (Miscellaneous)

Time: 10:30 - 12:00

Room: Room 524a

Abstract no.: 50841

HIGHER PREVALENCE OF PERIPROSTHETIC FRACTURES WITH CERAMIC-ON-POLYETHYLENE HIP BEARING COMPARED WITH CERAMIC-ON-CERAMIC ON THE CONTRALATERAL SIDE

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It is unclear whether late THA periprosthetic femoral fractures are related to a mechanical mechanism that decreases strength of the femur (for example, loosening) or to a biological problem as osteolysis. It is also unknown if ceramic on ceramic bearing couples decrease the risk of late periprosthetic fractures as a result of the absence of wear and osteolysis. Material and methods: We therefore asked whether the cumulative long-term fractures were different according to the couple of friction ceramic on ceramic or ceramic on polyethylene in 327 patients (654 hips) with bilateral THA (one ceramic-ceramic, and the contralateral ceramic-polyethylene) who had THA with cemented stems performed between from 1978 to 2000 for osteonecrosis. Results There were two intra-operative fractures (0.3%). The median follow-up was 22 years (range, 15–40 years), and at the most recent follow-up, the cumulative number of late (after 7 years of follow-up) post-operative fractures was 32 (5% of 654 hips). Fractures were unilateral, which means for the 327 patients, a 10% rate of fractures. Periprosthetic fractures increased in number with follow-up: seven fractures (1% of 654 hips) occurred within ten years of THA implantation, 20 (3%) within 20 years, 26 (4%) within 30 years, and 32 (5%) within 40 years. The risk of fracture was influenced ($p < 0.001$) by the bearing surfaces at the time of prosthetic implantation, low (0.3%) for ceramic on ceramic (1/32 fractures; 1/327 hips), high (10%) for ceramic on PE (31/32 fractures; 31/327 hips). Conclusion: when the contralateral hip of the same patient is the control, after 40 years of follow-up, post-operative fractures occur 30 times more often on the side with PE cup than on the side with ceramic/ceramic bearing.

Date: 2018-10-13

Session: Developing World Free Papers

Time: 10:30 - 12:00

Room: Room 524c

Abstract no.: 52483

BURNOUT SYNDROME IN PAEDIATRIC ORTHOPAEDICS DEPARTMENTS FROM SOUTHEASTERN EUROPEAN HOSPITALS

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The burnout syndrome is frequently encountered in the medical profession especially in the surgical field and it can lead to a lower efficiency and a decreased quality in health care. The objective of this study is to identify if the burnout syndrome is higher in the pediatric orthopedics then in other surgical fields like traumatology and orthopedics surgery or pediatric surgery. Materials and methods: Starting from the "Maslach Burnout Inventory" and "MBI-Human Services Survey for Medical Personnel (MBI-HSS MP)" we developed a survey with 15 questions rated on a scale of 0 to 6 and 6 questions rated true of false for the orthopedics pediatrics department that best fit the social and economics particularities of the region. The survey was randomized, with a total of 90 responders, which answered it on paper or online. Results: In orthopedic pediatric department 63.3% of responders feel fatigued, 23.3% feel that they do not treat patients as well as they would like to, 30% feel satisfied and only 13.3% feel energetic at the work place at least a few times a week. Also 96.7% consider that the medical staff is insufficient and the number of patients is very high while only 30% of responders consider that the medical act is very efficient; 60% of responders consider that the number of on-duty rotation per month is too high. Conclusions: The burnout syndrome is higher in pediatric orthopedics department and it is in relationship with the insufficient medical staff and the high number of patients.

Date: 2018-10-13

Session: Developing World Free Papers

Time: 10:30 - 12:00

Room: Room 524c

Abstract no.: 52408

EARLY FOLLOW-UP RESULTS OF TOTAL KNEE ARTHROPLASTY USING A NEW HIGH-FLEXION GENUIN PROSTHESIS

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Purpose: The purpose of this prospective study was to evaluate minimum one year follow-up results of total knee arthroplasty (TKA) performed using a new high-flexion prosthesis design (GENUIN). **Materials and Methods:** The one year results of 125 consecutive TKAs (113 patients) with the GENUIN posterior-stabilized prosthesis were evaluated. The patients were assessed clinically and radiographically using the Knee Society scoring system (KSS) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and Range of motion (ROM) before surgery, 3 months postoperatively, 12 months postoperatively. **Results:** The mean range of motion (ROM) increased significantly from 117.4° (range, 75° to 140°) preoperatively to 126.7° (range, 80° to 144°) postoperatively (p<0.001). The mean KSS and WOMAC scores improved significantly from 121.4 (range, 42 to 185) and 56.1 (range, 23 to 88) preoperatively to 174.0 (range, 130 to 200) and 16.4 (range, 0 to 85) postoperatively, respectively (both, p<0.001). One knee required exploration for superficial infection. No knee had aseptic loosening or osteolysis. Radiolucent lines were noted in 2 knees (4%). **Conclusions:** The new high-flexion total knee prosthesis resulted in no early aseptic loosening of the component and improved postoperative ROM comparable to other high-flexion TKA prostheses at one year follow-ups. Furthermore, no premature material failure or unusual biological response to the new bearing material could be detected.

Date: 2018-10-13

Session: Developing World Free Papers

Time: 10:30 - 12:00

Room: Room 524c

Abstract no.: 52219

COPING MECHANISMS AS PREDICTOR OF STRESS IN PATIENTS WITH LOW BACK PAIN: A NIGERIAN STUDY

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INTRODUCTION; Pain evokes emotional responses such as agitation, irritability and anxiety etc. these are normal feelings in everyday life but could result to organic disorder. This study describes the perceived stress and coping strategies as they occur in patients with low back pain. Also, to determine which coping strategy is a stressor. **METHOD;** A descriptive hospital based study. Brief cope and English perceive stress scale questionnaire were administered. Total of 100 patients were recruited. Data was analyzed using IBM SPSS version 22. Variables analyzed are the sociodemographic, dimensions of brief cope scale, perceived stress scale and logistic regression was used to show predictors of perceived stress. P-value of 0.05 was of significant statistical inference. **RESULTS;** Fifty-nine were females while males (n=41), age range 18 – 72yrs, mean SD is 15.93±1.35. Majority of the patients had lumbar spondylosis (n=39), facet joint arthritis (n=16) and TB spondylitis (n=10). Average VAS was 6. The perceived stress was low (M=28, SD=6.94), the coping mechanisms employed most by our respondent includes, religion (M=6.9, SD=1.77), planning (M=6.4, SD=1.34) and emotional support (M=6.0, SD=1.54). Using logistic regression, the coping skills most likely to be stressors are self blame, active coping, instrument support and venting. **CONCLUSION;** Emotional support, religion and planning were the common coping skills while venting, self blame and active coping were the stressors. The management of patients with low back pain should include psychological therapy.

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Abstract no.: 52012

CORRECTION OF NEGLECTED CLUBFOOT: AN EXPERIENCE IN DEVELOPING COUNTRIES

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The neglected clubfoot deformity is a problem of developing countries. There are very little studies available on treatment of the neglected clubfoot with major texts providing little more than anecdotal reference to triple arthrodesis as salvage. The purpose of this study is to develop easy and less invasive approaches for the treatment of neglected clubfoot and to make it pain free, plantigrade with reasonable mobility. Methods: 300 feet of 230 patients were treated in Ln. Mukhlesur Rhaman Plastic Surgery Hospital, Chittagong, Bangladesh, from 2009 to 2016. All patient initially presented with neglected clubfoot were tried with Ponseti method. 100 feet were corrected by Ponseti method. 200 feet did not response to Ponseti were selected for surgical treatment. Age of patients were 3 to 18 years. Non idiopathic clubfoot (syndromic, neuromuscular etc) and age younger than 3 years were excluded. Surgical procedures were PMR, PMR+Lateral Release, PMR+Lateral Release+Calcanocuboid or wedge osteotomy of anterior process of calcaneous. Results: 33% patients were corrected by Ponseti method+ Tendo Achilles lengthening. Among the surgeries, 38% required PMR, 47.5% PMR+ lateral release, 14.5% PMR+ lateral release + calcanocuboid or wedge osteotomy of anterior process of calcaneous for correction. According patient's/parent's satisfaction, 93% were Fully Satisfied, 6% Satisfied and 1% were Not Satisfied. Conclusion: Most of the Neglected club foot can be treated by simple procedures like PMR or PMR+ Lateral Release if initially started with Ponseti method.

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Room: Room 524c

Abstract no.: 51808

PATTERN OF SURGICAL SITE INFECTION AFTER ELECTIVE ORTHOPAEDIC SURGERY IN A MAJOR ORTHOPAEDIC CENTRE

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Objective: To determine the local prevalence rates of surgical site infection (SSIs) and the common causative organisms isolated from the infected wounds with their antibiotic sensitivity. Methodology: This prospective cohort study was conducted in Department of Orthopaedics for a duration of 02 years. Patients undergoing elective Orthopaedic surgery were followed up for a period of 30 days from the day of surgery. Wounds were examined for features of infection using the Southampton Wound Scoring System. Results: Out of the 243 patients, 12 patients 4.9% (7 female and 5 male) developed SSI, 8 out of 144 patients (5.6%) that underwent open reduction internal fixation (ORIF) developed SSI, 3 out of 51 (5.8%) patients that underwent Arthroplasty developed SSIs and 1 out of 38 that underwent soft tissue surgeries developed SSIs. There were no cases of SSIs in the group that had Arthroscopies. Out of the patients that developed SSI, 4 patients were hypertensive, 5 patients diabetic, 1 patient with HIV infection and 2 patients had no known comorbidities. The commonest causative organism isolated from the infected wounds was Staphylococcus aureus except one in which Klebsiella was isolated. All the isolated Staphylococcus aureus were sensitive to Amoxicillin- clavulanic acid combination, cefuroxime and clindamycin. Conclusion: Diabetes increases the chances of SSIs, but more studies need to be done regarding infection rates among diabetics. Since Staphylococcus aureus was the most commonly isolated organism we can use that information to improve skin preparation methods.

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Abstract no.: 51805

AWARENESS OF ORTHOPAEDIC DOCTORS AND OPERATION THEATRE ASSISTANTS OF RADIATION EXPOSURE

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Objective: To determine the knowledge of Orthopaedic doctors and operation theatre assistants (OTA) on radiation exposure from fluoroscope; its risks and protective measures. **Material and methods:** This study was conducted using a questionnaire which was distributed among the residents, consultants and operation theatre assistants (OTA) working in Orthopaedic operation theatres of tertiary care hospitals. Centers in which fluoroscope was unavailable were excluded from the study. Questions regarding number of surgeries performed/assisted in a week, no. of surgeries in which fluoroscope used, average no. of times fluoroscope image taken in a week during surgeries, information about the usage of fluoroscope, use of dosimeter, knowledge about the hazards of radiation, methods employed for protection against radiation during surgeries, ever had any symptoms of radiation sickness, etc were recorded. Data analyzed using SPSS version 23. **Results:** A total of 305 (60.4%) Orthopaedic trainees, 80 (15.8%) and 120 (23.8%) operation theatre assistants were included in the study. Average no. of surgeries performed/assisted in a week were n=18 per doctor/OTA, and in an average no. of 12 (66.7%) a fluoroscope was used. An average of 41.5 fluoroscope shot/case. Lead apron was the pre-dominantly (93%) used protective item followed by thyroid protector (17%) during fluoroscopy. Use of dosimeter by only (8%). **Conclusion:** Fluoroscope is an important part of Orthopaedic surgeries. Awareness among doctors and OTAs regarding fluoroscope use and its hazards is inadequate. Information about its use and protective measures should be an essential part of each Orthopaedic institute.

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Room: Room 524c

Abstract no.: 51126

ESSENTIAL FRACTURE AND ORTHOPAEDIC EQUIPMENT LISTS IN LOW RESOURCE SETTINGS: CONSENSUS DERIVED BY SURVEY OF EXPERTS IN AFRICA

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Introduction: Low- and middle-income countries (LMICs) have a growing need for trauma and orthopaedic (T&O) surgical interventions. Part of this is due to the high amount of road traffic accidents in LMICs. LMICs lack surgical resources and we aimed to develop recommendations for an essential list of equipment for 3 different level of care providers. Methods: The Delphi method was used to achieve consensus on essential and desirable T&O equipment for LMICs. Twenty experts with trauma and orthopaedic experience from LMICs underwent 2 rounds of questionnaires. Feedback was given after each round of questionnaire. Results: After 2 rounds of questionnaire, recommendations for each level of care in LMICs included 4 essential equipment items for non-operative based providers; 27 essential equipment items for specialist providers with operative fracture care, and 46 essential equipment items for tertiary providers with operative fracture care and orthopaedics. Conclusion: These recommendations have the potential to improve T&O care in LMICs. The essential equipment lists provided here are reasonable and feasible for LMICs healthcare systems, ensuring limited funding is targeted optimally. The recommendations can help with planning and organising national T&O care to attain appropriate capacity in the different levels of provider.

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Abstract no.: 50527

MEDICAL SERVICES DURING THE LIBYAN WAR

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The intensive fighting in Libya during the year 2011 and the sporadic skirmishes after has put a burden on the medical services with overstretched personnel working under very difficult conditions, and seriously ill and injured patients unable to reach hospitals and clinics. It was difficult to deal with this huge number of injured patients mostly civilians, warriors and militaries even by the best health system. Most of the hospitals were understaffed, and short of medical supplies for treatment of the war-wounded and those with chronic diseases in Libya. The Transient Authority (NTC), the inexperienced staff of the Temporary Department of Health and particularly the hospitals all over the country had a responsibility to deal with casualties. As the air embargo and unsafe land roads with critical shortages of supplies, the help from international was vital, particularly the personnel and medical supply. The Libyan Orthopaedic Association (LOA) with the help of volunteers has set up a charity organization named "National Program for Rehabilitation of the Amputee" (NPRA) has dealt with a Korean team to supply the amputee with state of the art prosthesis. More than 35 amputee benefited from the program that made life easy for them as it was done locally in the presence of their families without having to go abroad.

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Session: Pain Management and Osteoporosis Free Papers

Time: 10:30 - 12:00

Room: Room 525a

Abstract no.: 52220

**INTRA-OPERATIVE LOCAL INFILTRATION ANALGESIA DURING
PRIMARY TOTAL HIP AND KNEE REPLACEMENT: DOES IT WORK?**

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Background: Poor post-operative pain management in primary total hip and knee replacement (THR, TKR) leads to delayed mobilisation and reduced patient satisfaction. Modes of analgesia include oral, regional, peripheral nerve blocks (PNBs) and local infiltration analgesia (LIA). This study compared post operative analgesia and length of stay (LoS) and in THR and TKR, with and without LIA. Methods: Four cohorts were identified during August 2013 to November 2015. Group 1H and Group 1K had general anaesthesia (GA) and PNB for THR and TKR respectively. Group 2H and Group 2K had GA and LIA for THR and TKR respectively. Data collated included demographics, comorbidities, type of anaesthetic and nerve block, use of LIA, analgesia intake, LOS and complications. Postoperative analgesia was recorded daily for the first 4 days of stay. Results: There were 101 patients in Group 1H and 102 patients in Group 2H. There was significantly less analgesic intake in Group 2H on day of surgery and first day post-surgery ($p<0.02$) compared to other days. No difference in LoS was noted between two groups. Furthermore, there were 88 patients in Group 1K and 118 patients in Group 2K. There was significantly less analgesic intake on day of surgery and first day post-surgery ($p<0.01$) compared to other days. LoS in Group 1K showed a median of 3.3 days versus 4 days for Group 2K ($p<0.05$). Conclusion: LIA significantly reduced the need for postoperative oral analgesia up to 24 hrs post operatively although this did not translate into an earlier discharge from hospital.

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Abstract no.: 52016

COMPLEX REGIONAL PAIN SYNDROME: THERAPEUTIC ASSOCIATION OF BISPHOSPHONATES AND PALMITOYLETHANOLAMIDE

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UOC Clinica Ortopedica, AOU Sassari, Sassari (ITALY)

Complex Regional Pain Syndrome also known as Reflex Sympathetic Dystrophy is characterized by localized pain associated with edema and functional limitation as a result of trauma; the typical radiological sign is the marked osteoporosis of the district. According to guidelines, therapy involves use of anti-inflammatory drugs for the reduction of pain and edema, physiotherapy for functional recovery and the use of bisphosphonates to counteract the rarefaction of bone tissue. For the neuropathic component of pain the administration of Palmitoylethanolamide may prove useful. We selected 20 patients, followed on an outpatient basis for Complex Regional Pain Syndrome, who received intravenous 100mg Neridronic Acid therapy, with four consecutive administrations at time 0, day 3, day 6 and day 9, to which it was associated oral therapy with Palmitoylethanolamide for 3 months. Patients were evaluated clinically and with appropriate pain detection with VAS scale at the beginning and at the end of the therapy proposed at our outpatient facility. The association of Palmitoylethanolamide with bisphosphonate therapy, based on our experience, is useful in the reduction of pain symptoms, in particular by reducing the neuropathic component of pain that characterizes the Complex Regional Pain Syndrome. The care of the patient with Complex Regional Pain Syndrome provides the collaboration between the Orthopedic, the Physiatrist and the Physiotherapist for a correct diagnostic classification and for the proposal of a therapy that is as complete as possible and that allows the patient to improve the pain symptoms, the functional limitation but also the marked osteoporosis.

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Session: Pain Management and Osteoporosis Free Papers

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Room: Room 525a

Abstract no.: 49856

SMARTPHONES AND THEIR REPERCUSSIONS ON THE MUSCULOSKELETAL SYSTEM

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Introduction: The use Smartphones can cause musculoskeletal disorders because of repetitive movements and inappropriate positions. Objective: Identify the alterations in the movement of joints: cervical, elbow and wrist during the use of the Smartphone that cause musculoskeletal injuries. Material and methods: Prospective, descriptive and observational study of musculoskeletal pathology related to biomechanics by using the Smartphone in 66 people (10-80 years old), using a survey and photographs. The variables were: age, gender, type of Smartphone, usage time, manipulations, reason and percentage of use, addiction, pain, zone and angulations of the joints. Results: We included 66 people, 40 men and 26 women; average age 33 years, average of 4 hours 32 minutes of use. The average of selfies was 2.17, mostly in women. 23 people felt addicted and 23 suffered pain, 11 in cervical, with increased cervical angle, 1 in elbow, 6 in wrist and 7 in first finger. Statistical differences were observed ($p < 0.005$) between pain and mass of the Smartphone were observed. 17 presented tingling in the fingers, clinical symptoms of carpal tunnel syndrome, and 3 trigger fingers of the first finger. Conclusions: The use of the Smartphone causes pain from overuse and, over time, causes damage to the musculoskeletal system, such as neck pain, carpal tunnel syndrome and a trigger finger.

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Session: Pain Management and Osteoporosis Free Papers

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Abstract no.: 49797

LONG-TERM EFFECTS OF COCCYX EXCISION FOR CHRONIC REFRACTORY COCCYDYNIA

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Introduction: Coccydynia is a common condition characterized by disabling pain in the coccygeal region. Although conservative treatment is effective in majority of the patients, a few refractory cases continue to harbor prolonged pain, affecting daily activities. This study aimed to evaluate the outcomes of coccygectomy in such chronic patients. Materials and Methods: 15 cases of coccydynia, with no response to conservative treatment for 6 months, were included in the study. They underwent complete excision of the coccyx and were evaluated on the basis of a questionnaire, completed after the surgery. Results: All patients were followed up for 2 years. Female patients i.e. 9 were greater in number than males i.e. 6. Excellent results after coccygectomy were obtained in 6 patients, good results in 5, moderate in 3 patients and poor in 1 patient. Complication of superficial infection was seen in 1 patient, which was managed by antibiotics. Conclusions: Excision of the coccyx in carefully selected patients suffering from chronic pain, refractory to other modalities of treatment, produces desirable results with minimal complications.

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Abstract no.: 52018

BONE FRAGILITY IN BETA-THALASSEMIA MAJOR

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Beta-Thalassemia Major is a disease characterized by a deficit of beta globin chains that cause an early destruction of red blood cells. There are several signs that distinguish it: chronic hemolytic anemia transfusion-dependent, diffuse hemochromatosis, growth deficit, bone fragility. The bone fragility that is found in the thalassemia patient is linked to hypoparathyroidism secondary to malfunction of iron storage parathyroid, but also to ineffective erythropoiesis with consequent bone marrow expansion and severe osteoporosis caused by the lack of hydroxylation of vitamin D from related chronic liver injury to hepatic hemochromatosis. We present the case of a male patient, aged 38, suffering from Beta-Thalassemia Major, which comes to our attention for severe spinal instability, an important painful symptomatology located at the lumbar spine, signs of medullary compression. On the basis of the diagnostic investigations performed and the clinical aspects shown by the patient, we performed the surgical treatment of arthrodesis with a posterior approach from L1 to L5, with decompressive laminectomy of L3. During the postoperative period, the patient underwent rehabilitation treatment and followed a therapy with bisphosphonates. In outpatient examinations performed one month, three months, six months after surgery, the patient reported an important improvement in painful symptomatology and the implementation of motility, the disappearance of symptoms related to bone marrow compression. The radiographic controls performed at the same time confirmed the stability of vertebral synthesis.

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Abstract no.: 51106

GAMMA NAIL IN THE TREATMENT OF ATYPICAL FEMORAL FRACTURES DUE TO BISPHOSPHONATES THERAPY

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Introduction: As the life expectancy increased over the years so did the complications due to osteoporosis. Bisphosphonates therapy manages to reduce the incidence of fractures in patients with osteoporosis, although a long-term treatment can lead to atypical fractures. Surgical treatment represents a real challenge for orthopaedic surgeons given the intraoperative difficulties as well as possible postoperative complications. Materials and methods: We conducted a retrospective study between 2010 and 2017 and we included 19 female patients with atypical femoral fractures diagnosed with American Society of Bone Mineral Research radiological criteria. The mean age was 67 years old (extreme ages were 55 and 81 years old). The mean period of bisphosphonates therapy was 5.2 years. We included 12 subtrochanteric fractures and 7 femoral diaphyseal fractures. 15 patients presented prodromal symptoms from 4 weeks to one year before the diagnosis of fractures, all of them following low energy trauma. All patients underwent osteosynthesis with gamma nail. The postoperative mean follow-up was 2 years. Results: Of all 19 patients - 11 patients achieved complete union, 5 presented delayed union and 2 non-union, whereas in one patient we observed implant failure. The mean period of union was 21 weeks, except the 2 cases with non-union. Conclusions: Most patients presented prodromal symptoms. A high number of subtrochanteric fractures was recorded possibly due to muscle action. A high percentage of postoperative complications was observed in patients with previous femoral fractures and treatment with bisphosphonates.

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Session: Pain Management and Osteoporosis Free Papers

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Room: Room 525a

Abstract no.: 51119

SERUM VITAMIN D IN ELDERLY PATIENTS IN AN ORTHOPAEDIC WARD

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Objective: to assess the prevalence of vitamin D (VitD) deficiency in elderly patients in an orthopaedic ward. Methods: Data assessment obtained from a prospective study. Pre-operative VitD levels were measured in two groups of previously ambulatory patients between 65 and 85 years, one admitted with proximal femur fractures and another admitted for hip osteoarthritis surgery. There were no statistical differences in the group baseline characteristics. Statistical analysis was performed with SPSS v22. Results: 86 patients were assessed, 46 with hip fracture and 40 with hip osteoarthritis. The mean value of VitD was 11ng/mL (range 4ng/mL to 35,5ng/mL). Only five patients (5,8%) had VitD levels within normal range (over 20ng/mL), while 40 patients (41,9%) showed insufficiency (10-20ng/mL) and 50 showed deficiency (<10ng/mL). We found a negative correlation between comorbidity (by Charlson Index) and VitD ($p=0,006$). There was also difference between the two groups, patients presenting with hip fracture showing lower levels of VitD than patients with hip osteoarthritis ($p=0,027$). We found no correlation with sex, age, weight or body mass index. Conclusion: We found a very high prevalence of low levels of VitD (94,2%) in our study population. Patients with higher comorbidity had higher risk of lower VitD. Also, patients presenting with hip fracture had lower levels than patients with osteoarthritis, but overall VitD levels in both groups were low.

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Abstract no.: 49700

EVALUATION OF BONE MINERAL DENSITY IN PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY AND TOTAL KNEE ARTHROPLASTY

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Introduction: Advanced age and immobility due to degenerative disorders of hip and knee joints, are two of the important risk factors for developing osteopenia and osteoporosis. However there are conflicting reports in literature which suggest that osteoarthritis protect the patients from osteoporosis. Arthroplasty surgeons have not shown much interest in the evaluation of Bone Mineral Density (BMD) in these patients. Aim of this study was to assess the incidence of osteoporosis in patients undergoing Total Hip Arthroplasty (THA) and Total Knee Arthroplasty (TKA) using Dual Energy X-ray Absorptiometry (DEXA) scan. Material and methods: 50 patients each undergoing TKA (38 females, 12 males) and THA (33 males, 17 females) were evaluated for Bone Mineral Density (BMD). Patients with age of >50years, no history of steroid intake or metabolic bone disease were included in the study. Patients suffering from inflammatory arthritis were also excluded from the study. DEXA scan of femoral neck and lumbar spine was done at 0, 3, 6 and 12 months postoperatively. Results: 43.7% patients (53.3% females, 26.9% males) were found to be osteoporotic, 32.4% patients (33.3% females, 30.9% males) were found to be osteopenic and 23.9% (13.3% females, 42.3% males) were in normal range. More patients undergoing TKA were found be osteoporotic/osteopenic compared to patients undergoing THA. Patients with osteoporosis/osteopenia were given appropriate treatment. Conclusion: Study showed that osteoarthritis does not protect patients from osteoporosis. Hospitalization of patients for TKA/THA provide an opportunity to assess these patients for BMD and start an appropriate treatment where indicated.

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Abstract no.: 49660

CORRELATION OF VITAMIN D DEFICIENCY AND OSTEOPOROSIS IN RURAL POST MENOPAUSAL WOMEN IN CENTRAL INDIA

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Introduction: It has been estimated that 1 billion people worldwide have Vitamin D deficiency or insufficiency. Studies have shown a high prevalence of low 25(OH)D in postmenopausal women with osteoporosis worldwide. Vitamin D deficiency is highly prevalent in India. Various studies have suggested Vit D deficiency leads to decreased serum calcium this in turn leads to secondary hyperparathyroidism. This further adds to postmenopausal osteoporosis. Objective: To determine vitamin D (25OHD) status and its relationship with bone mineral density (BMD) in 100 postmenopausal women. Subjects and methods: Postmenopausal women were included according to inclusion and exclusion criteria after getting informed consent. Serum 25OHD and a peripheral DXA scan of the forearm (distal radius) and calcaneum were taken. The serum levels of vitamin D considered sufficient were ≥ 30 ng/mL, insufficient between 20 and 30 ng/mL and deficient < 20 ng/mL. The bone mineral density was measured and considered osteopenia when T value total of lumbar spine or hip was between -1 and -2.5 and osteoporosis < -2.5 . Results: Mean \pm SD of serum 25OHD levels were 18.0 ± 8.07 ng/ml. The prevalence of vitamin D deficiency was 62%. Patients with hypovitaminosis D had a lower BMD at the distal radius and at calcaneum ($p < 0.05$). Conclusion: We found a high prevalence of hypovitaminosis D and osteoporosis in postmenopausal women. Age, body mass index and vitamin D levels were correlated with bone mineral density at both sites (i.e. at distal radius and at calcaneum).