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Abstract Book

Short Free Papers

Date: 2017-11-30

Session: Foot & Ankle Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46383

ASSESSMENT OF FOOT ALIGNMENT IN PATIENTS WITH HALLUX RIGIDUS: THE ROLE OF WEIGHT-BEARING CT SCAN

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Background: An association between hallux rigidus and metatarsus primus elevatus (MPE) has been reported. These findings were based on standard weight-bearing radiographs and have not found consensus among foot and ankle surgeons. This study's aims were: 1) assess foot alignment in patients with hallux rigidus using 3D reconstructions from weight-bearing CT scans, and 2) assess intra- and inter-observer reliability of these measurements. **Methods:** A prospective study was performed in 50 consecutive patients with hallux rigidus and 50 control patients who underwent a weight-bearing CT scan for other reasons. Two investigators measured 1st and 2nd metatarsal declinations, 1st and 2nd metatarsal lengths, 1st-2nd intermetatarsal angle, hallux valgus angle, and foot width. Each investigator repeated the measurements after one month. **Results:** 1st-2nd metatarsal declination ratio was significantly lower in the hallux rigidus group (0.81) than the control group (0.92). Patients with grades 3 and 4 hallux rigidus under Coughlin and Shurnas' classification demonstrated significantly lower declination ratios than patients with grades 1 and 2 hallux rigidus. Hallux valgus angle was significantly lower in the hallux rigidus group (11°) than the control group (15°). Intra- and inter-observer reliability were excellent. **Conclusions:** Patients with hallux rigidus demonstrated MPE, which correlated with the severity of arthritis. It could not be determined whether MPE caused or was a consequence of hallux rigidus. The smaller hallux valgus angle in hallux rigidus patients indicates that true hallux rigidus in association with a true bunion is unlikely. Finally, weight-bearing CT imaging was a reliable method of assessing foot alignment.

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Abstract no.: 48137

ACUTE ACHILLES TENDON RUPTURES : ABOUT 112 CASES

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Introduction: Achilles tendon ruptures are frequent. Authors report a retrospective study of 112 cases of acute ruptures of Achilles tendon. Methods: between 2006 and 2013, 112 patients with an average age of 37 were operated for an acute Achilles tendon rupture. 85% of the patients were athletes. Football was the sport more frequently concerned in 90%. All patients were operated with open surgical repair using a postero medial approach, followed by a cast immobilization and rehabilitation. Results: patients were assessed on surgical follow-up, clinical evolution and resumption of sports activities. We obtained 85% good results with good tendon healing and recovery of ankle mobility. For athletes, the return to sport was effective on average at the 6th month. We noticed 2 cases of large cutaneous disunion requiring a covering flap and 7 cases of minor complications: 4 cases of superficial sepsis, 3 cases of skin disorders. Discussion: the optimal treatment strategy for an acute Achilles tendon rupture remains controversial, and both operative and nonoperative methods have distinct advantages and disadvantages. Among the available operative treatments, such as a traditional open surgical repair, there are also proponents of less-invasive surgical techniques including percutaneous and mini-open repairs. The open surgical repair has the advantage to restore the tendon length. Athletes can return to sport after a period of rehabilitation. Conclusion: direct surgical tendon repair is an excellent technique for the treatment of acute Achilles tendon ruptures. It ensures good healing of the tendon and restore it length

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WAPNER TECHNIQUE MODIFICATION

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WAPNER TECHNIQUE MODIFICATION There are different techniques to repair chronic Achilles tendon ruptures; among them is the Wapner technique. Demonstrate our results with modified Wapner's technique to get longer graft. Between 2010-2016, six patients went into surgery after chronic Achilles tendon rupture, using modified FHL transposition. Mean age: 41.8 years (21-55), 4 males and 2 females, 1 year minimum follow-up. In four, the transposition was a rescue of a failed primary repair and in two patients after neglected ruptures with big defects. Surgical technique: We performed the same medial incision on the midfoot to release the adhesions from the FHL with the flexor digitorum longus but in our technique, we get a longer graft getting the tendon from the base of the big toe proximal phalanx. Next, we performed a single transverse transosseous tunnel through the calcaneus, tunneling the FHL. We suture it on itself and on both ends of the Achilles tendon. We classified the results according to the Mann criteria. 3 patients achieved excellent results (without postoperative pain, activity limitation neither soft tissue complications, excellent strength and standing toes) and 3, good results (mild pain, decreased strength and mobility and small limitation in their activities). Longer FHL allows to cover greater defects and perform and augmentation with the Achilles tendon. The technique is simplified by performing a single transosseous tunnel. We propose our modification as a technique to consider in selected patients.

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Abstract no.: 48097

COMPARATIVE STUDY BETWEEN EXTENSILE LATERAL APPROACH AND FIXATION BY CALCANEAL PLATE VERSUS LIMITED LATERAL SINUS TARSI PPROACH AND FIXATION BY SCREW ONLY IN MANAGEMENT OF INTRA ARTICULAR CALCANEAL FRACTURES

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Introduction: Although extensile lateral approach and fixation with calcaneal plate remain the gold standard for management of intra articular fractures of the os calcis, recently, a great interest in less invasive approaches and fixation methods has aroused to minimize the soft tissue complications. **Methods:** A retrospective study was undertaken to compare the clinical and radiological results of the patients presenting to our institution in the period from December 2012 till August 2015 with sanders' type II and III fractures. Sixty-six patients with unilateral, isolated, simple intra-articular fractures were identified and divided according to the method of management into two groups. **Results:** Thirty three patients (mean age 35 years old) were treated by open reduction using limited lateral approach and fixation by screw only technique (Group I) and the other 33 cases (mean age 29 years old) by open reduction through extensile lateral approach and fixed internally by low profile calcaneal plate and screws (Group II). With a mean follow up of 28.8 months, no statistically significant differences between both groups were found clinically or radiologically. However, Group I had less soft tissue complications, postoperative hospital stay and were more cost effective than group II. **Conclusion:** Although extensile approach remains the gold standard however the new less invasive sinus approach shows comparable results both clinically and radiologically for management of these complex fractures.

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Abstract no.: 48152

FINE WIRE CIRCULAR FRAME FIXATION OF CALCANEAL FRACTURES

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Intra-articular calcaneal fractures are a potentially devastating injury. They represent 2% of all fractures commonly resulting from high energy injuries in younger patients. These fractures are challenging for orthopaedic surgeons to manage in order to achieve acceptable long term outcomes. Over the years many strategies have been implemented as treatment methods ranging from non-operative, closed manipulation and casting, percutaneous pinning, and open reduction internal fixation (ORIF). The management of such injuries with ORIF has often revolved around a large extensile lateral approach with fixation by use of locking plates. This approach has been associated with significant complications and often poor long term outcomes. The main complications appears to be wound breakdown which is likely to be due to the poor soft tissues associated with these high-energy injuries leaving them unable to cope with the second insult of surgery. Lately there has been more interest in the use of percutaneous fixation by use of fine wire circular frame fixators which may represent a more suitable option for the treatment of intra-articular calcaneal. Fine wire frames being less invasive, therefore compromise the soft tissues less, allow early weight bearing (ORIF does not allow this) and can be manipulated post-surgery. Our systematic review highlights several papers in the scientific literature that have compared such devices to alternative methods of fixation and we have analysed the outcomes and complications to ascertain the suitability over other methods. Overall the results are favourable for complication rates and appear to demonstrate favourable long term outcomes.

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Abstract no.: 48144

DOSE ANKLE MORBIDITY OCCURS AFTER PERONEUS LONGUS TENDON HARVESTING? THE FUNCTIONAL, CLINICAL, RADIOGRAPHIC AND BIOMECHANICAL STUDY.

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Introduction: the hamstring graft is a popular autograft for knee reconstruction. Some patient who has multiple ligament knee injury or small hamstring graft, the peroneus longus graft is an optional graft choice. The study of the ankle morbidity is rear. Method: Patients who undertook the peroneus longus graft harvesting during 2010 - 2015 with data available to be collected. The data included age, sex, height, body weight, side of surgery, sport activity, Visual analogue scale foot and ankle (VAS-FA), Thai version and Foot & ankle disability index (FADI). The functional score is collected at the last time follow up. Results: Fifty-two patients are included in study. Thirty patients are male. The average height, age and last time follow up are 166.6(\pm 9.3) cm, 34 years (22-48 years) and 4 years 2 months respectively. The average peroneus longus graft length is 28.5 cm. One case was reported mild numbness at surgical scar for 1 year. The mean VAS-FA Thai version and FADI are 97.8/100 and 103.5/104 respectively. Two patients report mild difficulty when single heel rise was performed. Eversion and 1st ray plantar flexion muscle. The isokinetic testing was performed in 10 patients. The peak torque of eversion and plantar flexion of harvested side were compared with non-harvested side are 77.2/77.45 N-M($p = 0.48$) and 17.93/17.83 N-M($p = 0.98$). In 6 patients MRI shown peroneus cross-sectional area was no different when compare with non-operative side. Conclusion: peroneus longus tendon harvesting is safe, very low complication and no effect on functional outcome.

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Abstract no.: 48835

A CADAVERIC STUDY OF A NEW TEST FOR SYNDESMOSIS INJURY

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Injury to the syndesmosis can not always be clearly demonstrated on radiographs and different tests have been described to assess for injury. These tests can be difficult to interpret and some are invasive; requiring objects being used to stress the syndesmosis. We have previously developed a simple assessment, which has been shown to give accurate intra-operative demonstration of an injury to the syndesmosis. Our objective was to ascertain if the same test could demonstrate any malreduction of the fibular after repair of a syndesmosis injury. Seven fresh frozen cadavers had complete syndesmosis disruption performed before fixation using a well-recognised technique with a single 3.5 mm small fragment screw. Purposeful malreduction was performed in three ankles and standard reduction in the remaining four. 2-5mls of contrast medium was then injected into the ankle joint. When there had been a malreduction, an obvious 'blush' of dye leaked superiorly into the surrounding soft tissues, whereas a normal ankle arthrogram was shown when the fibular had been anatomically reduced into the incisura and well fixed. This cadaveric study showed the test to be an easy and reliable adjunct to assess for acute malreduction of a syndesmosis injury.

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Abstract no.: 46853

EFFICACY OF PLATELET RICH PLASMA(PRP) VS STEROID INJECTIONS FOR TREATMENT OF CHRONIC PLANTAR FASCITIS

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Treatment of plantar fasciitis pose a therapeutic challenge in clinical practice. These lesions are managed by anti-inflammatory drugs, shoe modification and rest in early presentation. In chronic cases, intervention with intralesional steroid injections has been used with equivocal results. Autologous Platelet Rich Plasma(PRP) injection is in use recently with satisfactory results. This randomized controlled trial of 60 patients with plantar fasciitis was done in a tertiary care centre. Those patients with age more than 30 years, duration more than 6 months and no previous injection were included in the study. Patients with unhealthy skin condition around heel, neuro-vascular deficits and associated co-morbidities were excluded. They were grouped in two randomly. Group A received steroid injection and group B received autologous PRP injection. The reduction in pain, disability, sustained response, improvement in Visual Analogue score (VAS) & Foot and Ankle Disability Index (FADI) scores were compared with each other. Both groups showed improvement in VAS and FADI scores, however the results were significant ($p < 0.001$) and sustained in PRP group at the end of two years. Study showed no requirement for second intervention in majority of cases of PRP as compared to steroid group. Intra-lesional steroid injections in plantar fasciitis has good short term outcome but with a high recurrence rate. PRP accelerates healing of degenerative lesion with consistent relief from pain and can be considered as a safe, effective and reliable method in management of plantar fasciitis.

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Abstract no.: 46545

LONG-TERM FOLLOW UP OF CAPSULAR INTERPOSITION ARTHROPLASTY FOR HALLUX RIGIDUS

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Background: Capsular interposition arthroplasty is a joint and motion sparing procedure that has been shown to be an effective alternative to fusion. This study aimed to evaluate patient function and satisfaction after long-term follow up. Methods: There were 64 patients treated with capsular interposition arthroplasty for hallux rigidus by the senior author performed between February 1998 and July 2011. There were 22 patients who could not be reached for follow up and were thus excluded from the analysis. Therefore, 42 remaining patients were evaluated using VAS, FFI, SF-12, and patient satisfaction scores. The mean follow up was 11.3 (range, 4 - 16) years. Results: The mean VAS for pain was 7.9 preoperatively and 1.8 postoperatively ($p = 0.003$). The mean preoperative SF-12 physical score was 42.0 vs. 64.2 postoperatively ($p = 0.02$). The mean preoperative SF-12 mental score was 50.7 while the postoperative SF-12 mental was 54.6 ($p = 0.01$). The total FFI score also significantly improved, with a preoperative value of 98.3 and a postoperative mean score of 49.6 ($p = 0.001$). There was impressive patient satisfaction, with a mean score of 7.4/10. Overall, 39 of 42 patients (92.9%) stated they would have the surgery again. Four of the 42 patients (9.5%) required conversion to hallux MTP fusion at mean 6.1 years after index procedure secondary to pain but no other complications were reported. Conclusion: Capsular interposition arthroplasty represents a safe and effective treatment for severe hallux rigidus. These long-term results demonstrate a high level of patient satisfaction.

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Abstract no.: 48012

MODIFIED BROSTROÖM PROCEDURE FOR CHRONIC LATERAL ANKLE INSTABILITY IN PATIENTS WITH GENERALIZED JOINT LAXITY

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Background: Generalized joint laxity(GJL) has been considered a risk factor for late failure of ligament reconstruction in the knee; however, it is not known whether GJL is the cause of recurrent instability after the modified Brostroöm procedure for chronic lateral ankle instability. Purpose: To compare the clinical results of the modified Brostroöm procedure for chronic lateral ankle instability in patients with or without GJL. Methods: A total of 100 ankles who underwent the modified Brostroöm procedure were divided into 2 groups. Age and body mass index were matched between the 2 groups; laxity group(44 ankles; Beighton score>4) and 42.9 months in the nonlaxity group(56 ankles). Results: The mean preoperative Karlsson and AOFAS scores were improved to 87.4 and 89.5, respectively, in the laxity group and to 94.1 and 94.8, respectively, in the nonlaxity group at final follow-up. The mean talar tilt angle and anterior talar translation were improved to 7.3° and 6.0 mm, respectively, in the laxity group and to 5.2° and 5.0 mm, respectively, in the nonlaxity group at final follow-up. Failure rates were 11.4%(5 patients) in the laxity group and 1.8%(1 patient) in the nonlaxity group. Significant differences were found between the 2 groups in terms of the Karlsson score, AOFAS score, talar tilt angle, anterior talar translation, and failure rate at final follow-up($P<0.05$). Conclusion: Patients with GJL showed inferior outcomes and a higher failure rate compared with patients without GJL. Therefore, GJL appears to be a risk factor associated with recurrent instability after the modified Brostroöm procedure.

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Abstract no.: 46219

SAGITTAL RESECTION OSTEOTOMY WITH SUBTALAR FUSION FOR TREATMENT OF MALUNITED CALCANEAL FRACTURES

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Aim: The aim of this prospective study was to evaluate the results of combined lateral sagittal resection osteotomy with subtalar distraction fusion in heels with painful malunion of the os calcis. **Methods:** This case series included twenty two patients (23 feet). The mean age of the patients was 37.52 years. Sixteen (69.6 %) patients were initially treated conservatively, 5 (21.7%) patients were treated surgically and the last 2 (8.7%) were missed. The mean time elapsed before surgery was 11.43 months. The resected bone slice was used as a local graft for subtalar joint fusion. The mean follow up period was 20.83 ± 6.09 (range 19-35) months. **Results:** According to the scoring system, the mean score was 81.04 ± 13.71 . Satisfactory results were found in 18 (82.6%) patients, while 4 (17.4%) patients had unsatisfactory results. Post-operative radiographic assessment revealed an average increase in the heel height of 7.70 ± 1.22 mm and an average decrease of heel width of 8.39 ± 1.47 mm. The average correction in the coronal axis was about 8.04 ± 1.26 degrees. Complications included infection and non-union in 3 (13%) heels. Two (8.7%) heels still had varus heels post-operatively and one (4.3%) patient had injury to the sural nerve. The restoration of heel height, the reduction of heel width, and the primary fracture pattern had a significant relation with the final score. **Conclusion:** In conclusion, this method is a successful method for management of subtalar arthritis due to malunited calcaneal fractures with broadening leading to lateral abutment.

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Abstract no.: 48017

COMPARISON OF TOTAL ANKLE ARTHROPLASTY OUTCOMES FOR OSTEOARTHRITIS WITH MODERATE AND SEVERE VARUS MALALIGNMENT AND THAT WITH NEUTRAL ALIGNMENT

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Background: Higher complication rates have been reported in ankles with preoperative coronal deformity than in those with neutral alignment during total ankle arthroplasty(TAA). The purpose of present study was to compare the outcomes of TAA of preoperatively moderate and severe varus ankles and neutral ankles. Methods: One hundred and five ankles were divided into three groups by preoperative coronal plane tibiotalar angle during the mean follow-up period of 51 months. Thirty-five patients in each group had moderate varus alignment(5–15°), severe varus deformity(>15°), and neutral alignment(<5° varus). Each group was matched for age, sex, body mass index, and follow-up duration and had similar characteristics to those obtained from preoperative demographic data. Results: Mean postoperative AOFAS, VAS scores, ROM and complication rates did not differ among three groups significantly. By comparison, there was less improvement in the SF-36 score of the severe varus group($p<0.05$). The mean postoperative tibiotalar angles were 3.1°, 4.6°, and 2.6° in the moderate varus, severe varus, and neutral groups, respectively. Although the severe varus group showed less corrected alignment than the neutral group, the mean tibiotalar angles of the three groups were within neutral alignment. Conclusions: TAA for ankles with moderate and severe varus deformity showed similar satisfactory clinical and radiographic outcomes as those with neutral alignment. These results suggest that TAA could be an appropriate treatment strategy for treating osteoarthritis of the ankle joints regardless of coronal varus deformity in the presence of proper implant positioning and ligament balancing.

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Abstract no.: 47012

FACTORS AFFECTING FUNCTIONAL OUTCOME AND UNION IN MANAGEMENT OF DISTAL TIBIA FRACTURE USING MINIMALLY INVASIVE PERCUTANEOUS PLATE OSTEOSYNTHESIS.

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INTRODUCTION Minimally invasive percutaneous plate osteosynthesis(MIPPO) has emerged as the preferred treatment option in the management of distal tibia fractures due to the presence of thin soft tissue coverage in this area. The aim of the study was to analyze factors which effect the functional outcome and union in these fracture. **Materials and Methods** 62 distal tibia fractures including 12 open fractures (5 Gustilo type I and 7 type II) operated using MIPPO with at least one year follow up were retrospectively analyzed. While open fractures (Gustilo grade III) were excluded from the study. The fracture fusion was assessed based on x rays, fuctional outcome were assessed by functional evaluation system of Karlstrom-Olerud. Data was analyzed to see if the dependent variable could be predicted by the independent variables in the study . Only the significant predictors are retained in the model at each step. **Result-** Mean age was 48.4 ± 9.6 years. More than half (n=34) had an antero-lateral plating done, while remaining (n = 28) had medial plating. **Regression model** - [Functional Score = $33.12 - 0.89*(\text{Gender}) - 1.33*(\text{plating type}) + 3.77*(\text{ fracture grade}) - 0.59*(\text{time of surgery})$]. [Fracture union = $11.82 - 7.68*(\text{fracture grade }) + 1.23*(\text{time of surgery})$]. **Conclusion-** While age, comorbidities and classification of fracture did not predict functional score and union. ; Gender, type of plating, time of surgery and fracture grade (open/close) were factors which affects the functional outcome and union in management of distal tibia fracture using minimally invasive percutaneous plate osteosynthesis.

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Abstract no.: 46283

SHORT-TERM CLINICAL RESULTS OF CERAMIC TOTAL TALAR PROSTHESIS FOR OSTEONECROSIS OF THE TALUS

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Introduction: An alumina ceramic total talar prosthesis is one option for osteonecrosis of the talus. Good clinical results were reported in initial studies by the developer. We investigated the clinical and radiographic results of implantation of this prosthesis by an independent hospital. **Methods:** Eight ankles in 7 patients with osteonecrosis of the talus who were treated with total talar replacement from 2006 to 2009 were included. We used an alumina ceramic total talar prosthesis (Kyocera Medical Corp, Japan). All patients were assessed according to the American Orthopaedic Foot and Ankle Society (AOFAS) score at preoperation, postoperation, and final follow-up. Visual analog scale (VAS) for pain (range: 0–10) and satisfaction score (range: 0–5) were also investigated. We evaluated sclerosis of the tibia and talus and migration of prosthesis by radiography at final follow-up. **Results:** The mean follow-up period was 3.3 ± 1.2 years. AOFAS scores were significantly improved from 64.5 ± 11.4 at preoperation to 81.9 ± 4.6 at postoperation and were maintained at 83.9 ± 5.8 at final follow-up ($p=0.004$, 0.001 , respectively). VAS for pain significantly decreased from 64.0 ± 15.4 to 26.9 ± 17.3 ($p<0.001$), and satisfaction scores averaged 4.5 at final follow-up. No patients had sclerosis of the tibia or talus or migration of prostheses. However, two patients who had combined tibia replacement had a radiolucent line of tibia implant. **Discussion:** Good clinical results can be achieved with an alumina ceramic total talar prosthesis at an independent hospital, similar to results of initial studies by the developer. However, further evaluation of mid- and long-term clinical results is needed.

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Session: Shoulder Short Free Papers

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Abstract no.: 47497

**SHORT CEMENTLESS STEM FOR SHOULDER REPLACEMENT:
RADIOLOGIC AND CLINICAL EVOLUTION**

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Introduction: The aim of this study was to analyze radiologic and clinical evolution a mid-term follow-up of uncemented short stem shoulder prosthesis. **Material and Methods:** Thirty six uncemented short stem were evaluated in a single center study: 20 anatomic and 16 reverse primary replacements. The mean age was 69 years old (14 males ;22 female) and the minimum follow-up was 24 months (mean 36 months; range 24-47 months). Clinical assessment was based on Constant score and radiologic analysis was performed on plain X-rays. **Results:** At final follow-up, radiolucent lines were identified in 11%, partial osteolysis of greater tuberosity in 50%, thinning of the cortex in 39%. These radiologic findings had no significant clinical effect and the Constant score significantly improved post-operatively to reach 75 ± 9 pts ($p < 0.001$). No loosening or subsidence was seen. Age, BMI, smoking, design of the prosthesis (reverse vs anatomic), had no significant correlation with radiologic evolution. However, cortex thinning was correlated with high degree of diaphysis filling ($p = 0.04$) and female with anatomic replacement had more bone remodeling. **Conclusions:** Uncemented short stem cause substantial bone adaptation without functional issue at mid-term follow-up. Femal gender with high filling index were even more at risk and a cemented implant would be recommended in this situation. Long term follow-up is required to evaluate the evolution of these remodelling effects on the survival of the implant.

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Abstract no.: 46302

WHAT IS THE BEST GLENOID CONFIGURATION IN REVERSE SHOULDER ARTHROPLASTY?

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The purpose of this study was to analyze the effect of different glenoid designs, and then of combination of glenoid and humeral designs on arm position and range of motion (ROM) following RSA. Methods Using a three-dimensional computer model of RSA, a short curved onlay stem with a 145° inclination was combined to five different glenoid design varying by glenoid sphere diameter and glenoid sphere center of rotation location. Glenoid offset, acromiohumeral distance (AHD), ROM and muscle length were evaluated for each configuration. Results Altering glenoid design led to a nearly 6 mm change in glenoid offset and 3 mm in the AHD. There was a 7° improvement in abduction and flexion between the different glenoid design. Only 2 of them, the 36mm centered and the Bio-RSA, did not reach native adduction. In extension and external rotation arm at side, the eccentric 36 mm sphere was the best configuration. The 42 mm sphere present a limited external rotation at 90° of abduction. When combining glenoid and humeral design, a threshold of 1.8 on the Humeral Offset/AHD discriminated between configuration with external rotation limitation or deficit. Conclusions With varying glenoid prostheses, dramatic change could be observed on extension, external rotation arm at side and external rotation at 90° of abduction. Taking particular attention to a low placement of the glenoid implant, which could be increase by using eccentric sphere, is important as this directly improvement ROM.

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LONG-TERM RESULTS AFTER PROSTHETIC REPLACEMENT OF RADIAL HEAD FRACTURES

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Introduction: The study presents long-term results of a bipolar prosthesis in the treatment of radial head fractures and dislocation fractures of the elbow joint. Material and methods: Thirteen patients were treated with the same bipolar metal prosthesis (Tornier SA, FR) within a period of seven years (1998-2004). Indications were: isolated radial head fractures in four cases (Mason III; group 1), elbow dislocations with radial head fractures in five cases (Mason IV; group 2) and Monteggia injuries in four cases (group 3). Eleven patients were assessed after 12 to 18 years including a radiologic and functional examination. Results: There were no radiologic signs for stem loosening, prosthetic wear, or severe osteoarthritis in any case. The functional result was assessed according to the Geel and Palmer score (CORR 1992). In group 1 and 2 all patients had excellent results with almost free function and no instability or pain. In group 3 all patients had good results with slight motion deficits. However, all patients were satisfied with their result and had returned to former work or leisure activities. Conclusion: Although prosthetic replacement of radial head fractures is a seldom performed procedure, it has proved to be a safe method with a low rate of technical failures. The prosthesis warrants immediate and long-lasting joint stability. Results are influenced more by concomitant injuries of the elbow joint rather than by the prosthesis itself. Consequently, the radial head prosthesis should be kept in the mind of surgeons and in store of any trauma department.

Date: 2017-11-30

Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 48141

RE-EVALUATING FOLLOW-UP STANDARDS FOR COMPLICATIONS AFTER RADIAL HEAD ARTHROPLASTY: SYSTEMATIC REVIEW AND RE-INTERPRETATION OF THE INTERNATIONAL LITERATURE

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The primary objective was to define the minimum follow-up (MF) required to produce a reliable estimate of the true surgical re-intervention rate after radial head arthroplasty (RHA). The secondary objective was to define the leading reasons for re-intervention after RHA. Ovid Medline, Ovid Embase, Scopus, Cochrane Library were searched from 2000 through 2016. we included studies that reported reasons for failure (Group I (GI)), and follow-up results (Group II (GII)) after RHA. With respect to Group I, a meta-analysis was performed to obtain the standard MF, the reasons for failure, and the mean time to surgical re-intervention. For each study in GII, the patients' MF was compared to the standard MF. Among the 1276 studies identified, 40 studies were included; 80 RHA having undergone reoperation (GI), and the results of follow-up an additional 1204 RHP (GII) reported in 3 and 37 articles respectively. The mean time to re-intervention in GI was 16.34 ± 19.64 mos (range: 0-135); the standard MF was 39 months. Painful loosening (44), isolated stiffness (42), and humero-radial conflict (21) were the three primary reasons for re-intervention. With respect to GII, 33 (89.19%) articles reported a MF less than the standard MF; the mean MF of articles (GII) was 22.52 ± 16.85 mos (range: 3-72). Recent literature has not provided a reliable estimate of the true re-intervention rate after RHA. The reproducibility of results could be improved by utilizing a MF of a minimum of 3 years and by establishing consensus definitions for the primary reasons for failure of RHA.

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Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 48198

SHOULDER ARTHROPLASTY FOR THE TREATMENT OF RAPIDLY DESTRUCTIVE ARTHRITIS

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Introduction: Rapidly destructive arthritis (RDA) is the marked destruction of a joint within months after the onset of symptoms (>2 mm in 1 year or 50% joint space narrowing in 1 year). RDA in the shoulder is a rare event. Its pathogenesis remains unclear. This condition presents a diagnostic challenge and a therapeutic one, because the surgeon has to deal with a massive destructed joint. **Case Report:** The authors present the case of a 65 year old male with left shoulder pain started 10 months early, that started after a left hand and wrist cellulitis. He had pain in all range of motion, which was severely restricted. He had type II diabetes mellitus. Didn't have fever and inflammatory markers were negative. X-ray showed a destruction of the humeral head and articular space narrowing. Scintigraphy revealed great inflammatory activity but was negative for infection. CT scan and MRI showed a massive destruction of the humeral head and glenoid. VAS score was 8. SSV 40%. The patient was submitted to a arthroscopic biopsy which was negative for infection. He was submitted to reversed shoulder arthroplasty with bony increased offset. **Outcomes:** The patient followed the rehabilitation protocol and has now 1 year follow-up. VAS is 0. SSV 90%. Follow-up exams are presented. **Discussion:** RDA is a characterized by rapid collapse of the humeral head with no evidence of other nonseptic articular arthropathy. This poses a real challenge for the surgeon who needs to reconstruct joints with large bone defects.

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Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47448

ARTHROSCOPIC VERSUS OPEN LATARJET FOR RECURRENT SHOULDER INSTABILITY : SYSTEMIC REVIEW AND META-ANALYSIS

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Background: arthroscopic and open Latarjet procedures for the management of recurrent anterior glenohumeral instability are both effective surgical options. Our aim is to review the literature for the best available evidence if either of these techniques were superior. Materials and methods: we systematically reviewed the online literature using the PubMed, Cochrane and Google scholar database searching for comparative studies about open and arthroscopic (Latarjet) procedures for recurrent anterior shoulder instability. We included five studies and extracted clinical and radiographic outcome data for meta-analysis. Results: total patients of 907, mean age 26.2 years. Operation time in favor of open, $p = 0.002$ with significant heterogeneity. Post-operative pain (VAS) in favour of arthroscopic $p = 0.0001$. Western Ontario Score Index (WOSI) score was better in open in sport and physical section while no difference in Lifestyle and Emotion section. ROWE score in favor of arthroscopic with significant heterogeneity. Similarly, Walch-Duplay score in favor of arthroscopic with significant heterogeneity. Nonunion and graft osteolysis were higher in open $p = > 0.05$, while graft position and screws angle of convergence (alpha angle) were better in open $p = > 0.05$. No significant difference in the complications such as recurrent instability $p = 0.34$, infection $p = 0.60$, hematoma $p = 0.12$ and graft fracture $p = 0.66$. Conclusion: the functional outcome and complication are comparable; open latarjet is better in operation time, graft positioning and recurrence rate. While arthroscopic is the better regarding pain and graft osteolysis.

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Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46403

THE USE OF THE LARS™ SYSTEM IN THE TREATMENT OF AC JOINT INSTABILITY – LONG-TERM RESULTS AFTER A MEAN OF 7.4 YEARS

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Background and Purpose: The acromioclavicular (AC) joint itself is of great importance for shoulder stability and one of the most frequently injured regions of the shoulder. The purpose of this study was to review the long-term clinical and functional outcome after operative treatment of AC joint dislocation (Rockwood III - V) using the LARS™ system. **Methods:** This study was performed as a retrospective single-centre data analysis of a level one trauma center. All patients treated operatively for an acute AC dislocation with the LARS™ system between 2003 and 2013 were included. **Results:** The study group consisted of 3 female (6%) and 44 male patients (94%) with an average age of 37 years. The overall mean clinical outcomes at latest follow-up were: Constant 93, DASH 2.64, ASES 96, SST 97, UCLA 34 and VAS 0.4 – representing a good-to-excellent outcome at latest follow-up in all patients. Overall, 45 patients (96%) reported to be very satisfied with the achieved result at latest follow-up. In four patients (9%), complications occurred during the follow-up period, requiring surgical revision in three patients (75%). **Interpretation:** Reconstruction of the AC joint with the LARS™ ligament achieves good-to-excellent clinical and functional outcomes at long-term follow-up with a failure rate of 6%.

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Session: Shoulder Short Free Papers

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Abstract no.: 46247

ARTHROSCOPIC REMPLISSAGE: IS IT STILL AN OPTION? A REPORT OF 51 CASES

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Introduction:The posterolateral humeral head defects can be large and engaging on the anterior glenoid and usually contribute to anterior shoulder instability in 40 to 90% of cases. The purpose of this study is to evaluate the results of the largest series of patients who underwent arthroscopic remplissage with Bankart repair for recurrent anterior shoulder instability due to associated bankart lesion with large and engaging (>25% involvement) humeral Hill-Sachs defects.**Patients and Methods:**51 patients underwent arthroscopic Bankart repair with remplissage technique for the treatment of recurrent anterior glenohumeral instability with large and medial Hill-Sachs defects. Preoperative imaging in all patients identified Bankart lesion with an associated Hill-Sachs defect that involved greater than 25% of the humeral head. Rowe score was used to clinically assess the patients.**Results:**Forty six patients were male. The mean age of the patients was 28.7 years. The mean follow-up period was 31 months (range,20-39 months). At final follow-up, 3 patients reported recurrence of instability (2 dislocations and 1 subluxation). The mean Rowe score improved to 95.4 points (function, 45.5 of 50; stability, 26.4 of 30; Motion, 8 of 10; pain, 8 of 10).**Conclusion:**Arthroscopic remplissage technique and bankart repair offered satisfactory results and still considered to be an effective, safe and reliable procedure for treatment of glenohumeral instability in cases with large and medial Hill-Sachs defects.

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Session: Shoulder Short Free Papers

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Abstract no.: 48554

SHOULDER ULTRASOUND: THE PERSPECTIVE AND ACCURACY OF THE ORTHOPEDIC SURGEON

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Background: The use of shoulder ultrasound (US) during the appointment, by the orthopedic surgeon, allows a quicker way for the patient to achieve treatment as it provides the surgeon reliable information about the joint structures (rotator cuff, long head of biceps and acromio-clavicular joint) that have a true impact on the course of the treatment. This study aims to evaluate the sensitivity and specificity of shoulder US, performed by an orthopedic surgeon, to detect rotator cuff tears (RCT). Methods: Using the method described by the BESS Working Group (Oxford University), 40 consecutive shoulders were evaluated with US during the appointment and then the results were compared with the arthroscopy findings. Results: For the detection of supra and infraspinatus tears there was a 100% sensitivity and 81,2% specificity; 81,2% sensitivity and 86,2% specificity for subscapularis tears. 94,7% sensitivity and 50% specificity for the detection of the biceps tendon presence in its groove and 88,9% sensibility and 38,5% specificity for biceps tendon stability. Conclusions: Current literature supports the use of US as a valid diagnostic method for the evaluation of complete rotator cuff tears, being as precise as MR. This study documents a high diagnostic accuracy of shoulder US when performed by a trained orthopedic surgeon, which is in accordance with the literature. The use of shoulder US during the appointment allows the surgeon to provide the patient with a quicker and straightforward resolution of his shoulder pain.

Date: 2017-11-30

Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

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Abstract no.: 48168

**THE NATURAL HISTORY OF FULL THICKNESS ROTATOR CUFF TEARS
IN RANDOMISED CONTROLLED TRIALS**

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Background: Rotator cuff tears represent the most common tendon injury resulting in significant morbidity. There is debate within the literature behind the optimum surgical or non-operative management for these patients. Objective: To assess the overall treatment response to all interventions in full-thickness rotator cuff tears in patients enrolled in randomised clinical trials. Methods: A systematic review of Medline, Embase and CINAHL databases was performed to identify randomised controlled trials (RCTs). Patients ≥ 18 with full-thickness rotator cuff tears were included. The primary outcome measure was change of Constant score from baseline at 52 weeks. A meta-analysis to assess treatment response was calculated using standardised mean difference (SMD) in constant scores. Results: 40 RCTs were included. The pooled SMD, compared to baseline at 3 months was 1.30 (95% CI 0.58-2.03), at 6 months was 3.26 (95% CI 1.32-5.20) and at 12 months was 3.41 (95% CI 1.43, 3.98). Graphical plots of treatment response demonstrated a sustained improvement in outcomes in both non-operative trial arms and all operative sub-group arms. Conclusions: Patients with full-thickness rotator demonstrate a consistent improvement in Constant score irrespective of intervention. Consideration should be given to the natural history of patients with rotator cuff tears who show recovery, regardless of treatment.

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Abstract no.: 48567

ONE TO NINE YEARS FOLLOW-UP AFTER HYDRODISTENSION FOR ADHESIVE CAPSULITIS OF SHOULDER

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Introduction: Adhesive capsulitis is a common condition causing painful limitation of shoulder movements. Physiotherapy is usually the main stay of treatment, but some patients have residual stiffness which may require further intervention. Hydrodistension is one of the techniques, where-in the joint is distended with fluid to release the adhesions and improve shoulder movements. **Patients and Methods:** A prospective study was done until discharge and then functional scores were sent out to patients to analyse outcome of hydrodistension of shoulder. All patients with a minimum one year follow-up were included and secondary adhesive capsulitis due to previous surgery were excluded. All patients had trial of physiotherapy initially. In hydrodistension the shoulder joint was localised using image intensifier and injected with a mixture of local anaesthetic (chirocaine) and normal saline, usually between 100-150 mls. The joint was gently mobilised and improvement in range of movements documented. All patients underwent intensive post-op physiotherapy. Functional outcome was assessed using oxford shoulder and quick DASH scores. Of the 92 patients with complete data, females were predominant. With a mean follow-up of 61.5 (13-107) months, pre-op quick DASH scores improved from 52.4 (21.3-87.5) to 30.35 (0-90.9) and the Oxford shoulder scores improved from 15.2 (3-36) to 34.8 (6-48). The mean pre-op VAS pain score improved from 8.02 (1-10) to 2.02 (1-8). There were no intra-operative complications. Five patients needed arthroscopic release for recurrence. **Conclusion:** Hydrodistension is a safe and effective procedure in the treatment of adhesive capsulitis of shoulder.

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Abstract no.: 46201

PERCUTANEOUS TENOTOMY VERSUS PLATELET RICH PLASMA FOR TREATMENT OF RESISTANT TENNIS ELBOW

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Background: Lateral epicondylitis, or tennis elbow, is a very common cause of elbow pain among the general population. Some cases are resistant to treatment and lead to marked disability. **Patients and methods:** Seventy patients with chronic lateral epicondylitis refractory to conservative treatment were included in this study. The patients were divided into two treatment groups. The first group contained thirty-three cases treated by percutaneous tenotomy of the common extensor origin (group I) whereas the second group contained thirty-seven 20 cases treated by local injection of platelet rich plasma (group II). **Results:** In the first group, after a mean follow up of 36.9 months, the average VAS improved from 8.4 to 3.1, the average DASH score improved from 74 to 48 and the average Nirschl score improved from 5.7 to 2.9. In the second group, after a mean follow up of 37.3 months, the average VAS improved from 8.6 to 1.9, the average DASH score improved from 72 to 44 and the average Nirschl score improved from 5.6 to 1.6. **Conclusion:** Both methods are effective for treating resistant lateral epicondylitis. Percutaneous tenotomy is simple and efficient. Platelet rich plasma should be tried before surgical treatment for treating chronic lateral epicondylitis. **Keywords:** Lateral epicondylitis, PRP, percutaneous tenotomy, DASH score.

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Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46319

THE COMPARATIVE EFFECT OF CORTICOSTEROID AND PLATELET-RICH PLASMA INJECTION THERAPIES FOR THE MANAGEMENT OF LATERAL EPICONDYLITIS: A SYSTEMATIC REVIEW

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Background: Lateral epicondylitis (LE) is a common musculoskeletal disorder of the upper limb. While various modes of treatments are available, none of these modes have been considered as a definitive management of LE. Objectives: To evaluate the comparative effect of corticosteroid and platelet-rich plasma injections. Study design: systematic review. Methods: Eleven databases used to search for primary studies evaluating the comparative effect of corticosteroid and PRP injections for lateral epicondylitis. The included studies were appraised for their quality using Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0, CASP Randomised Controlled Trial Checklist, and SIGN Methodology Checklist 2. Results: 732 study papers were identified. 5 randomised controlled trials met the inclusion criteria. Corticosteroid injections provided rapid improvement in symptoms up to 8 weeks, before its therapeutic effect starts to decline, while PRP injection showed slower steady improvement up to the end-point of 104 weeks (2 studies). Corticosteroid injection showed Improvement in symptoms up to 3 months, although the degree of improvement started to decline after 1-month follow-up, while PRP showed significantly slower but ongoing improvement up to the end-point of 3 months (1 study). Corticosteroid showed its peak therapeutic effect between 6 weeks and 3 months, before declining, while ongoing improvement seen with PRP up to the end-point follow-up of 6 months (1 study). Comparable therapeutic effect of corticosteroid and PRP injections was observed at 6 weeks (1 study). Conclusion: Corticosteroid injections provide rapid but short-term therapeutic effect compared to the relatively slower but longer-term effect of platelet-rich plasma.

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Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

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Abstract no.: 46297

HIGH GRADE BURSAL-SIDE PARTIAL ROTATOR CUFF TEARS: COMPARISON OF MID- AND LONG-TERM RESULTS OF ARTHROSCOPIC REPAIR AFTER CONVERSION TO FULL-THICKNESS

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Introduction:Partial thickness rotator cuff tears are one of the leading causes of shoulder dysfunction. Successful results have been reported with different techniques but there is no consensus about the best treatment choice. The purposes of this study are to evaluate mid- and long-term clinical outcomes of arthroscopically repaired bursal-side partial-thickness rotator cuff tears (PTRCTs) after conversion to full-thickness and to identify the possible effects of age, gender and hand dominance on clinical outcomes. **Methods:**Twenty-nine patients who had undergone arthroscopic repair of a significant bursal side PTRCTs, were evaluated functionally. The repair was made after conversion to full-thickness. The average patient age was 55.2. Evaluations were made preoperatively and postoperatively 2nd & 5th years by physical examination, Constant and VAS pain scores. **Results:**Average Constant score improved from 38.9 preoperatively to 89.2 at 2nd year and 87.8 at 5th year postoperatively ($p=0.0001$). Average VAS pain score decreased from 7.90 preoperatively to 1.17 at 2nd year and 1.31 at 5th year postoperatively ($p=0.0001$). Significant improvement was detected in functional outcome and VAS score of the patients at postoperative 2nd and 5th years compared to preoperative period. The difference in functional scores between postoperative 2nd and 5th years was not statistically significant. The patients who underwent surgery from their non-dominant extremity showed higher increase in Constant scores which was statistically significant ($p=0.022$). **Conclusion:**Arthroscopic repair of high-grade bursal-side PTRCTs after conversion to full-thickness is a reliable surgical technique with good functional outcome and pain relief both at mid- and long-term follow-ups. Surgery of non-dominant side might be related with better functional outcomes.

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Abstract no.: 48326

EFFECT OF THE ALLOGENIC DERMAL FIBROBLAST TO ENHANCE ROTATOR CUFF HEALING IN A RABBIT MODEL OF CHRONIC ROTATOR CUFF TEAR

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This study is to identify the effect of allogenic dermal fibroblast on tendon-to-bone healing in a rabbit model of a chronic rotator cuff tear. Total 33 rabbits were randomly allocated into 3 groups (n = 11 each). Supraspinatus tendon was detached and left for 6 weeks for establishing chronic tear model. Torn tendon was repaired using transosseous manner with the injection of 5×10^6 allogenic dermal fibroblast (ADF) with fibrin in group A, fibrin only in group B, and saline injection as a control in group C. At 12 weeks after repair, the mechanical tensile strength test and Masson's trichrome staining was conducted for the biomechanical and histological assessment of tendon-to-bone healing of repaired rotator cuff. Seven rabbits (1 in group A, 2 in group B, 4 in group C) died before the final evaluation. For the biomechanical test, the mean load-to-failure resulted 46.1 ± 11.9 N/kg, 34.2 ± 9.0 N/kg, 31.5 ± 8.9 N/kg for group A, B, and C, respectively, and group A showed significantly higher load-to-failure than other groups ($p = 0.014$). Although there was no significant difference ($p = 0.413$), group A showed higher incidence of mid-substance tears than insertional tears (mid-substance tear rate was 50% in group A, 22% in group B, 29% in group C). For the histologic evaluation, group A demonstrated better collagen fiber continuity and orientation than the other groups. The current study verified the potential benefit of ADF for rotator cuff healing in terms of biomechanics and histology.

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Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47452

BICEPS TENODESIS: IS IT A MUST TO TENOTOMIZE THE PROXIMAL STUMP? AMR ABDEL-MORDY ALI KANDEEL, MD LECTURER OF ORTHOPEDICS & TRAUMATOLOGY, FACULTY OF MEDICINE, MENOFIA UNIVERSITY

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Background: Literature reported many different techniques of biceps tenodesis with a basic step; to tenotomize the proximal stump of the long head of the biceps tendon off the superior labrum. Hypothesis: Is it a must to tenotomize the biceps tendon during biceps tenodesis or can the labral origin of the biceps tendon be preserved; so expanding the role of biceps tenodesis to include off-loading the superior labrum and proximal tendon stump till healing; avoiding inadvertent biceps tenotomy; decreasing the failure rate of biceps tenodesis; and shortening the operative time? Patients & Methods: 27 patients with different biceps tendon lesions (SLAP lesion, pulley lesion, hypertrophy, atrophic tendinitis, tearing, and instability) were prospectively managed by arthroscopic intra-articular or sub-acromial, or mini-open sub-acromial biceps tenodesis using suture anchor without tenotomizing the biceps proximal stump. Postoperative results were evaluated at 1-year follow-up in terms of pain, range of motion, function, UCLA and ASES scores and return to work. Results: There was a statistically significant improvement in pain, range of motion, functional activity, UCLA and ASES scores and return to work. These results were comparable to those reported in literature for biceps tenodesis with tenotomy of the biceps proximal stump off its labral origin. Conclusion: This technique of biceps-anchor-preserving biceps tenodesis has satisfactory preliminary clinical results, in addition to possible advantages as off-loading of the superior labrum and biceps tendon proximal stump till healing, avoiding the inadvertent biceps tenotomy, decreasing the failure rate of biceps tenodesis and shortening of the operative time.

Date: 2017-11-30

Session: Shoulder Short Free Papers

Time: 10:30 - 12:00

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Abstract no.: 46980

**OUTCOME ANALYSIS OF PROXIMAL HUMERUS FRACTURE
DISLOCATIONS WITH AXILLARY EXTRUSION OF HUMERAL HEAD**

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Aim: Axillary extrusion of humeral head in fracture dislocations are a major challenge in treatment. There is no known study to evaluate the outcome in these patients, where fixation is performed. In view of complete dislocations avascular necrosis thought to be of high incidence. **Materials and methods:** From Jan 2010 to December 2012, Total of 20 patients out of 300 proximal humerus fractures treated in our hospital, with fracture dislocation & axillary extrusion of humeral head. Males-13, Females-7, Mean age- 54.7 (from 34-77yrs). Injury due to Fall (11 cases) ,while RTA(9 cases). 10 patients had comorbidities. **Surgical technique:** All patients operated by Delto pectoral approach and axillary extruded head was reduced by indirect reduction technique using schanz pin as joystick passed through fracture site, with image control, reduction of fragments done and fixed with either Philos or buttress plates. **Results analysed for Union, Avascular necrosis and Functional assessment using Constant & DASH Scores.** **Results:** All fractures had united without Avascular necrosis and without infections. Average time for union 14 weeks. Mean follow up 11 months. Normal Measurements in 100 shoulders(control), HeadShaft Angle-(30–50) 37.67°, Offset-55–65mm (61.22), GreaterTuberosity-6to9mm (7.41mm) were compared with our radiological outcome, at final followup. Average Constant Score was 79.65, DASH Score was 35.24. **Conclusion:** Indirect reduction technique gives excellent outcome. Vascularity doesnot seems to be a major concern, if soft tissues are not disturbed.

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Session: Shoulder Short Free Papers

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Room: 10. Room 1.64

Abstract no.: 48718

DISTAL BICEPS TENDON RUPTURE REPAIR- ACCELERATED VERSUS PROTECTED REHABILITATION OUTCOMES

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Introduction- Incidence of distal biceps tendon rupture has gone up to 10%. An untreated rupture causes loss of strength up to 40% in supination and 30% in elbow flexion. We aimed to assess the effect of accelerated versus protected rehabilitation on final outcome of distal biceps tendon repair. Materials and Methods- It's a prospective cohort study by two different surgeons with similar operative technique using different rehabilitation programme. Clinically suspected distal biceps tendon ruptures confirmed by ultrasound scans or Magnetic resonance imaging are included. Post-operatively clinical and functional assessment done with Quick-DASH, Mayo elbow and Oxford Elbow scores Results- All 39 patients were males, average age 41.61 years, dominant side involvement in 23 patients. There were 28 patients in protected and 11 in accelerated rehabilitation group. Predominant mechanism of injury was lifting or pulling and pushing heavy weight (21) and Sports related injury in 09 patients. Two patients were on steroids, 4 on inhalers for asthma and 4 on long-term statins. 21 ruptures confirmed on MRI and 11 on US, while 7 patients with US required further MRI scan. Average time to surgery from the injury was 21 days and average follow-up 3.7 months. Post-operatively, 13 patients had lateral cutaneous nerve of forearm paraesthesia and they all recovered. At final follow-up, all the patients had full ROM with good power and no re-rupture. 23 patients returned to pre-injury level work. Conclusion- Accelerated and protected rehabilitation programme in distal biceps repair does not have any influence on the final outcome.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 48839

**TREATMENT OF PATHOLOGICAL HUMERAL FRACTURE USING
ENDOPROSTHETIC REPLACEMENT – LONG TERM FOLLOW-UP.**

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Background: The humerus is a common site for pathological fractures and endoprosthetic replacement is one of the standard treatments for both primary and metastatic bone disease. Methods: We have reviewed 177 patients who underwent PR for pathological fracture of humerus between 1976-2016 to assess the clinical and functional outcomes of treatment. 95 patients were males. Mean follow-up was 72-months. Surgical indication included humeral fracture with preexisting tumour, chemosensitive primary malignant bone tumours such as Osteosarcoma and Ewing's sarcoma (33%), solitary metastatic carcinoma (31%). EPRs were proximal (82%), diaphyseal (5%), distal (8%) and total humeral prostheses (6%). Soft tissue reconstruction was performed using Mersilene mesh, Trevira tube or simple closure. Mean length of resection was 143 mm (60-342). Results: The survival of implant at 10, 20 and 30 years were 78%, 75% and 62% respectively. Overall survival was 49% at 10 years, 47% at 20 years, and 33% at 30 years. Diaphyseal humeral prostheses had lowest implant survival with aseptic loosening being the most common mode of failure. Local recurrence occurred in 6 patients (3%). Complications that required surgical treatment occurred in only 28 patients (16%) such as infection (3%), symptomatic subluxation (4%) and aseptic loosening (5%). Average MSTS functional score was 76%, with diaphyseal humeral prosthesis having the best functional outcomes both in score and range of movement. Conclusion: EPR for pathological humeral fractures offer a reliable and durable construct at all locations. Diaphyseal prostheses provided good functional results but had higher rates of failure. Careful patient selection is recommended.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 48357

IS FROZEN SECTION OF MARROW BIOPSY IS NECESSARY AT THE TIME OF RESECTION OF MALIGNANT BONE TUMOURS?

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Introduction: Frozen section of marrow biopsy is routinely done at the time of resection of bony tumours to assess adequacy of resected bony margin. This study was done to know whether it is required when MRI can provide accurate information on intramedullary extent. **Material & methods:** Between 2000-2016, 338 patients with malignant bone tumours underwent en-bloc resection & reconstruction (186) or amputation (153). All patients underwent conventional MRI imaging within 1 wk of planned resection to assess intramedullary and soft tissue extent of the tumour to plan resection length. It was found that intramedullary or soft tissue extent of the tumour has increased in 43 patients. Resection was planned based on the maximum extent of the tumour either on initial imaging or imaging studies done for restaging. After carrying out the osteotomy at planned resection level, marrow biopsy was taken from the bony stump and sent for histopathological examination along with resected segment. No frozen section was done in any of the patient. **Results:** No tumour was found in any of the bone marrow biopsy. Detailed histopathological examination of the resected specimen also confirmed that extent of tumour closely matched the extent of tumour determined on MRI. **Conclusions:** MRI can accurately determine the intramedullary and soft tissue extent of the tumour. Our experience suggests that frozen section of bone marrow biopsy at the time of definite resection is unnecessary. However it is important that MRI to decide resection length should be done within short period before surgery.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 46644

IS THE MIRELS' SCORING SYSTEM FOR IMPENDING PATHOLOGICAL FRACTURES REPRODUCIBLE?

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Introduction: Mirels' scoring system is widely used for predicting the risk of pathological fracture of metastatic long bone lesions and hence the need for prophylactic fixation. This study aimed to assess this scoring system and analyse whether it is reproducible in a separate population. Methods: A retrospective review was performed of all patients undergoing a bone scan to assess metastatic disease between February 2011 to February 2016 at one centre. Patients were included if the scan identified a long bone metastases and simultaneous plain radiographs and clinical letters were available for review. Each lesion was scored using Mirels' scoring system independently by two authors. Patients were followed up for one year to assess if a pathological fracture had occurred. The proportion of pathological fractures for each score was then calculated. Results: During the study period 50 patients were identified; 62% male and the mean age was 70 years (range 45 to 91). The commonest primary tumours were prostate (50%) and breast (32%). The most frequent location for deposits were proximal femur (62%), femur (18%) and proximal humerus (14%). Overall 18% of patients suffered a pathological fracture with a mean Mirels' score of 9 compared to a score of 6.9 where no fracture occurred. An increasing Mirels' score is associated with an increasing risk of pathological fracture; score of 7 had 14.3% risk and a score of 11 had 100% risk of fracture. Conclusion: The Mirels' scoring system has been shown to be reproducible in our population.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 46196

LIMB SALVAGE USING LIQUID NITROGEN TREATED TUMOUR BEARING AUTOGRAFT

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Introduction: Reconstruction of bone defect after en-bloc resection in tumours is challenging. Recycled autograft though seems perfect option. We present our experience of using recycled tumour bearing bone after treating it with liquid nitrogen. **Material & methods:** Between Sep. 2010 and July 2016, 4 females and 6 males with age ranging from 8-35 yrs. underwent this procedure. 7 patients had Ewing's sarcoma, 2 patients had osteosarcoma and 1 patient had liposarcoma. The affected segments of bones were proximal humerus in 2 pts., proximal femur in 1 pt., shaft femur in 2 pts., distal femur in 2 pts. and distal fibula in 3 pts. In all patients after resection, bone was stripped of soft tissue and periosteum. Intramedullary reaming was done. Bone was immersed in liquid nitrogen for 25 minutes followed by thawing, followed by dipping in an antibiotic mixed saline. Internal fixation was done using interlocking plates or combination of intramedullary nailing and plating. **Results:** Bony union was achieved in all patients. There was no local recurrence in any of the re-implanted bone. Mean MSTS score was 84. **Conclusions:** There are many advantages of using recycled bone, wherever feasible. It is an anatomically size matched graft, inexpensive and restores bone stock. Re-implanted bone acts as scaffold for creeping substitution and incorporation. Though there are other methods of treating resected tumour bearing bone such as ECRT, autoclaving, pasteurization, but treatment with liquid nitrogen has shown to be superior as it doesn't denaturize the collagen resulting in better mechanical strength.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47569

THE MID-TERM OUTCOME OF DISTAL RADIUS RECONSTRUCTION FOR GIANT CELL TUMOR: COMPARISON OF UNCEMENTED THREE-DIMENSIONAL PRINTING PROSTHESIS AND OSTEOARTICULAR ALLOGRAFT

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Objectives: To compare the surgical techniques, as well as clinical, radiographic and complications outcomes between uncemented three-dimensional printing prosthesis and osteoarticular allograft reconstruction for distal radius giant cell tumor. **Methods:** Seven and twelve patients who underwent uncemented three-dimensional printing prosthesis (prosthesis group) and osteoarticular allograft (allograft group) reconstruction for distal radius giant cell tumor were evaluated at an average follow-up of 26.0 and 40.0 months respectively. Surgical techniques, clinical records, radiographs, and Mayo wrist score were evaluated. **Results:** In the prosthesis and allograft groups, the average surgical time was 2.8h (2.5-3.0h) and 3.2h (2.7-3.4h), respectively; the length of resection was 9.1cm (7.5-11.5cm) and 8.9cm (8.0-11.0cm), respectively. In the allograft group, the host bone and allograft union rate was 100%, and the average time for bone union was 9m (7-12m). Subchondral bone alterations and joint narrowing were detected in all cases. There were 3 patients suffered from associated pain (especially upon palmar flexion of the wrist). There was no allograft fracture. Both in these two groups, there were no infection, local recurrence and metastasis. The average Mayo wrist score were 65 and 80 points in the prosthesis and allograft groups, respectively. **Conclusions:** Compared with osteoarticular allograft reconstruction, uncemented three-dimensional printing prosthesis reconstruction requires higher preparation technology. However, prosthesis related surgical technology is relatively simpler, the matching degree between prosthesis and the distal wrist joint is closer to the anatomy, the postoperative function of prosthesis reconstruction is better, and there were no allograft-related complications when using prosthesis.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 46716

LONG-TERM SURVIVAL AFTER SURGICAL TREATMENT IN PATIENTS WITH BONE OR SOFT TISSUE METASTASES FROM RENAL CELL CARCINOMA

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Purpose: Owing to the improvement in treatment outcomes of renal cell carcinoma (RCC), surgical resection is now recommended in patients with metastatic lesions. This study evaluated the long-term outcome of surgery for bone or soft tissue metastases from RCC. **Patients and Methods:** Between 1993 and 2014, 58 patients (46 men and 12 women) underwent surgery, excluding palliative surgery, for bone or soft tissue metastatic lesions from RCC at our institution. These patients were retrospectively evaluated for factors associated with prognosis by using the log-rank test and Cox proportional hazards analysis. **Results:** The patients' mean age was 60 years, and the mean follow-up period was 52 months. The surgical sites included the spine (33 patients), bone of extremity (10 patients), pelvis (8 patients), thoracic bone (4 patients), and soft tissue (3). The surgical procedures were total en bloc spondylectomy (TES) in 33 patients, wide excision in 13, and curettage in 12. The 3-, 5-, 10-, and 15-year overall survival (OS) rates were 75%, 62%, 48%, and 25%, respectively. According to the surgical methods, the 5-year OS was 64% for TES, 62% for wide excision, and 46% for curettage. By multivariate analysis, non-clear cell type RCC and treatment history of two or more metastases were independent risk factors for poor prognosis. **Conclusion:** Our findings suggest that the surgical resection of bone and soft tissue metastatic lesions from RCC is a favorable option for improving prognosis even in patients with unfavorable conditions.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 46621

SURGICAL MANAGEMENT OF METASTATIC SPINAL COLUMN TUMOURS BASED ON MODERN PRINCIPLES: A REPORT OF FIVE CASES

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With about fifty percent of all skeletal metastases, the spine represents the most common site of bony metastases as well as the third most common site of metastasis overall. Tumours of the lung, breast and prostate have the highest frequency of metastasis to the spinal column of all primary tumours. Spinal cord compression is a common complication among patients with spinal metastases and is reported in five to ten percent of patients with spinal metastases. Development of spinal surgery and surgical management of metastatic spine tumours in the last five decades with the "NOMS framework" provides us with a modern approach with three main goals: 1) spinal stabilisation, 2) decompression of neural structures and 3) pain management. Surgical treatment results in a better outcome when combined with radiotherapy rather than radiotherapy alone. Indications for surgical treatment of metastatic spinal column tumours include pain, pathological fractures (impending and actual) and neurological deficit. The Tomita score and the revised Tokuhashi Score have proven to be very useful tools in the decision making process. Additionally, the Spine Instability Neoplastic Score can be applied in the assessment of spinal instability. We present five cases of metastatic spinal column tumours surgically managed by modern principles. Our cases include multiple metastases of breast cancer, kidney cancer metastases and ovarian cancer metastases on various spinal segments. Surgical techniques in our cases included vertebrectomy, spinal stabilisation, intralesional excision, vertebroplasty and percutaneous stabilisation, used in various combinations based on the particular needs of each case.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47879

MANAGEMENT OF RECURRENCE IN GIANT CELL TUMOURS

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Recurrence in Giant cell Tumours is common. This occurs following curettage but also following curettage with cauterization, cementation extended curettage. Most of the cases at this stage by excision and reconstruction do well but repeat recurrences and metastasis to the lungs has also been reported in literature in these cases. We are reporting our experience of managing recurrence in GCT of bones. Material and Method: We treated 8 cases of recurrence in GCT in the past 20 years. These include GCT proximal femur 1, GCT distal Radius 2, GCT distal femur 2, GCT 1st Metatarsal 1, GCT middle Phalanx little finger 1 and GCT proximal fibula 1. All of these cases were treated with repeat surgeries and in one case of proximal fibula the patient is continuing without any progress on Ibandronic acid 150 mg orally on monthly basis. Results: We had soft tissue recurrence in 1 GCT of distal Radius, 2 local recurrences one managed by Ibandronic acid 150 mg oral tablet and 1 by excision and reconstruction and all the rest recurrences reporting to us with excision and reconstruction. Discussion: Metastasis is well known in GCT following repeat surgeries for recurrences. Curettage also known as intra-lesional excision leaves microscopic tumour remnants which bring about recurrence in spite of cauterization, cementation or extended curettage. Our 7 cases with repeat surgeries did not metastasize and also did not show local recurrence in long run. We recommend excision and reconstructions for all cases of aggressive GCT and GCT presenting with recurrences.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47700

**: DIAPHYSEAL RECONSTRUCTION IN MALIGNANT BONE TUMORS –
SURGICAL OPTIONS.**

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BACKGROUND :Diaphyseal malignant bone tumors have various methods of reconstruction after diaphysectomy. **METHODS** :Resection techniques and various methods of diaphyseal reconstruction will be shown including: 1.Metallic implants e.g. Nail & cement, Plate & cement and intercalary endoprosthesis device. Examples of each reconstruction will be shown in DiaphysealOsteogenic Sarcoma Humerus (1 case), Diaphyseal Chondrosarcoma of Femur (1 case) and Diaphyseal Chondrosarcoma of Tibia (1 case) with complete follow up.2.Biological Reconstruction – include use of non-vascularized fibula (single/dual fibula), Vascularized Fibula, Allograft, Composite graft, Extracorporeal radiotherapy and Distraction Osteogenesis. The cases include DiaphysealOsteogenic Sarcoma of Femur (3 cases) , DiaphysealOsteogenic Sarcoma of Tibia (1 case) and Ewings Sarcoma of Tibia (1 case).**RESULTS** :Non-vascularized fibula undergoes fatigue fracture if defect is longer than 8 cms. Dual nonvascularized fibula keeps the patient on bed for long time. Risk of fracture and infection is there with allograft. Extra-corporeal radiotherapy is very inexpensive alternative. Diaphyseal reconstruction with intercalary device has shorter rehabilitation time.**CONCLUSIONS** :Intercalary implants allow early rehabilitation. Endoprosthesis device is good for small central diaphyseal lesions. Plate/ Nail with cement is another good option. Nonvascularizedgraft only if the defect is < 8 cms. Prefer dual fibula in femur / tibia, but single fibula in upper extremity. Composite graft has better results than allograft alone or fibula alone but availability of diaphyseal allograft is a problem. Intercalary resection and ECRT is inexpensive technique with good functional results.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

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Abstract no.: 46987

OUTCOME OF EN BLOC SURGICAL RESECTION OF LOCALLY ADVANCED PANCOAST TUMORS WITH VERTEBRAL INVASION. AUTHORS: TIM JIYA, JOHANNES BOLDER, RICARDO FELLER, CHRIS DIEKHOF, ERIC KRAANEVELD, KOEN J. HARTEMINK

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Introduction: Locally advanced Pancoast tumors with vertebral invasion were previously considered non-resectable and proffered an overall poor prognosis. However, with the advancement of modern spine reconstruction techniques and multidisciplinary approach, en bloc resection with a curative intent is feasible. This study reports on outcome of trimodal therapy with complete resection of locally advanced Pancoast tumor with vertebral invasion. Methods: A retrospective analysis of all patients treated for Pancoast tumor at our institution was performed to identify those patients with stage T4 vertebral involvement. All relevant clinical data, imaging and histological studies were retrieved and analyzed. Results: A total of 18 patients with locally advanced grade T4 Pancoast tumor with vertebral involvement and without mediastinal N2 nodal involvement or distant metastasis underwent en bloc surgical resection. A vascularized fibula graft or an expandable titanium implant aided spinal reconstruction in addition to instrumented posterior spinal fusion. All patients received preoperative chemo-irradiation. Follow up ranged from 7 days to 168 months. Of the 10 patients still alive 5 have survived 5 years with 2 attaining 10 year survival. Seven of the 8 mortality were disease or surgery related. Histology showed radical resection in all but 2 patients with residual vital tumor in 11 patients. Low residual vital tumor load and radical resection favors survival. Conclusion Curative treatment is feasible in locally advanced Pancoast tumor with vertebral invasion although associated with a high mortality and complication rate.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

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Abstract no.: 46553

**EXCISION OF AGGRESSIVE BENIGN TUMORS OF DISTAL FIBULA
WITH RECONSTRUCTION USING FIBULAR AUTOGRAFT**

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MASHHOUR²

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Resection of the distal fibula has usually been indicated only for pseudoneoplastic lesions or benign or low-grade malignant tumors. After the introduction of combined therapy and improved preoperative radiographic staging, local surgery has been the main line of treatment also for aggressive benign lesions known to have high rate of local recurrence. Patients and methods: in this study, we evaluate the midterm follow up results of en block excision of benign aggressive tumors of distal fibula followed by reconstruction using ipsilateral fibular auto graft. Nine patients who are skeletally immature and had the diagnosis of distal fibular tumors had the treatment method consisting of tumor excision with preservation of growth plate followed by ankle reconstruction using their ipsilateral fibula. Results: at the last follow up visit, no cases had any recurrence of the tumor and no alteration of ankle growth has been seen in any of our study group. Conclusion: en block excision of distal fibular tumor followed by reconstruction using ipsilateral distal fibular autograft is a simple, efficient and reproducible method of treatment of aggressive benign lesions affecting such an important area.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47839

FATE OF STRUCTURAL ALLOGRAFT FOR THE BONE TUMOR IN CHILDREN AND ADOLESCENTS

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The purpose of study is to observe the incorporation of allograft in reconstruction for wide resection of the bone tumors in children and adolescents. Twenty patients, who had been treated with structural allograft reconstruction for wide resection of the bone tumors from 1992 to 2010 were retrospectively reviewed. The duration of follow-up was 5 to 24 years (average 10 years). There were 14 males and 6 females, and age ranged from 3 to 15 years old (average 9 years). Diagnoses were 13 osteosarcomas, 4 osteofibrous dysplasia, and 1 Ewing sarcoma, 1 adamantinoma, and 1 fibromatosis. The anatomical locations were 8 femurs, 7 tibiae, 3 humeri, and 2 others. The length of allograft ranged 5 to 21 cm (average 13 cm). Thirteen patients of malignant tumors were received chemotherapy, and 7 not. The overall survival rate in 15 malignant tumor patients was 73%. Reconstruction related complications were delayed or non-union in 3(15%), graft resorption in 1(5%) and fracture in 4(20%). The overall complication rate was 45%. Once allograft united to the host bone, radiographic bone density increased with time. Periosteal appositional bone formation over the surface of the allograft and remodeling of the bone were observed. It is well incorporated to the host bone with periosteal new bone formation over the junction and surface of the allograft and remodeling. Structural allograft acts as not only osteoconductive, but also osteoinductive material in children and adolescents.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47727

FUNCTIONAL OUTCOME IN SACRAL TUMORS WITH NO RECONSTRUCTION FOLLOWING EXCISION

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Limited data is available on surgical management and subsequent functional outcome following resection for sacral tumors which pose special challenges in management. Our study aims to evaluate the functional outcome following surgical excision for sacral tumors without any reconstruction. An observational prospective study on patients undergoing surgery for sacral tumours from January 2006 to January 2015. A total of 28 patients who had undergone partial or total sacrectomy were evaluated for age, gender, sacrectomy levels, tumor type and functional outcome using the Patient Reported Outcomes Measurement Information System(PROMIS) Global Item short form. Of 28 patients, there were 17 males and 11 females, average age was 35.6 years(range 22 to 64 years). Chordoma was the commonest tumour seen in 19 patients(68%). There were 4 Malignant Peripheral Nerve Sheath Tumours, 2 Ewing sarcomas, 2 Chondrosarcomas and 1 MFH. The sacral levels of tumour were S1(n=6), S2 (n=12), S3(n=7) and S4(n=3). With posterior approach, total sacrectomy was done in 15 cases while level based resection was done in the rest. Average follow up was 38.5 months(24 to 44 months). PROMIS score was done at end of 2 years in 21 patients, 5 had died and 2 were alive with the disease and excluded. Chi square test and Fisher's test were used for comparing level based resections. More cephalic the resection, poorer was the physical health on PROMIS, total sacrectomy 38 to 44 versus S4 56 to 68, higher was the morbidity (total sacrectomy 26 to 48 versus S4 60 to 62).

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47702

PROBLEMS AND COMPLICATIONS OF MEGA-PROSTHESIS IN LIMB SALVAGE SURGERY- A RETROSPECTIVE ANALYSIS OF 25 PATIENTS

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BACKGROUND :Retrospective analysis of 25 cases where various kinds of Indian mega prosthesis were used.Post-operative complications were noticed. Picking up mega prosthesis of improved design or metal for reducing complications.**METHODS** patients included 25 (15 males and 10 females) of age 17- 45 years from year 2001 till 2016. Distal femur (10 cases) proximal tibia (7 cases) proximal humerus (5 cases) pelvis (2 cases) and diphyysis tibia (1 case). Histopathology included Osteogenic Sarcoma (7) Chondrosarcoma (4) Ewings Sarcoma (1) Malignant Spindle Cell Tumor (4) Aggressive Giant cell tumor (7) Solitary myeloma (1) and Solitary bone metastasis (Renal cell carcinoma) (1).**RESULTS :**Local recurrence with lung mets was seen in 1 case and pulmonary metastasis without local recurrence seen in 3 patients. Various complications in 21 cases included skin necrosis (2 cases),aseptic loosening (1), infection (7 cases),problems with polyethylene component(2),mechanical failure (a) with trauma (2 cases),(b) without trauma (1),periprosthetic fracture (1),removal of megaprosthesis(3), amputation later on(2), metallosis(3 cases),heterotrophic ossification(1),incorrect surgical technique leading to removal(1),wrong custom implant (1), massive limb edema(1). Overall megaprosthesis survival was 15 out of 21at 3-14 yr follow up. Revision rate were 4 out of 21 within 3 yrs of implantation. Patient survival was 21 out of 25.**CONCLUSIONS :**Limb salvage surgery is not a one time heroic procedure.However Improved surgical techniques, Modular implants, better design and metals,Lesser mechanical problems given better results in Indian scenario.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47579

CLINICAL EXPERIENCE WITH LOCAL ADJUVANT BISPHOSPHONATES FOR TREATMENT OF GIANT CELL TUMORS OF BONE

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Background: In addition to inhibiting osteoclast-mediated bone resorption, bisphosphonates exhibit promising antineoplastic properties. We have developed a surgical bone defect reconstruction method which incorporates local delivery and elution of zoledronic acid (ZA). **Aim:** To report our clinical experience with a combination of local adjuvant use and addition of ZA into a bone defect reconstruction composite for treatment of giant cell tumors of bone. **Methods:** We prospectively followed 7 patients (6f, 1m, mean age 39 (range 21-62)) who underwent surgery for primary (n=3) or recurrent (n=4) giant cell tumor of bone in our department between June 2014 and November 2015. The intervention consisted of extended curettage, local intra-cavitary application of ZA and bone defect reconstruction with a composite of cancellous allograft and an antibiotic-eluting bone graft substitute (Cerament™|G, BONESUPPORT, Lund, Sweden), to which ZA was admixed. Patients were followed clinically and with serial x-rays & CT scans. **Results:** Progressive radiologic consolidation was evident in all cases. All patients remain fully ambulatory at latest follow-up, with good to excellent clinical function and no clinical or radiological evidence of local recurrence. Histology from one case, obtained 18 months postoperatively, confirmed abundant bone formation in the grafted periphery of the bone defect. **Conclusion:** Local delivery and elution of ZA may be a clinically useful adjunct to surgical treatment of giant cell tumors of bone. Local adjuvant bisphosphonates may contribute to a substantial reduction of local giant cell tumor recurrences in our patients. However, further experimental and clinical evidence is needed to confirm this hypothesis.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 48143

PELVIC RING TUMORS. RESECTION AND RECONSTRUCTION

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Primary and secondary malignant tumors as well as aggressive benign tumors are relatively common in pelvic ring. The region II (acetabulum) is the most common, followed by the region I (iliac) and III (rami). 28 patients underwent pelvic/sacral surgery from 2000 till 2016. 10 condrosarcoma, 6 cordoma, 4 giant cell tumor, 2 osteosarcoma and 2 metastases. We also had one case of Ewing sarcoma, peripheral nerve sheath sarcoma, osteoblastoma and schwannoma. There were 7 curettages and 18 resections, 13 with wide margins, 3 marginal and 2 intralesional. There were 4 infections, all in the sacrectomy patients, 2 resolved and 2 became chronic. Also neurologic sequels were presented in the 3 total sacrectomy patients. One of the pelvic reconstruction failed and there was the need for revision. Relapses occurred in 4 condrosarcomas, 3 of which evolved with lung metastases and death, and 1 had the need for pelvic amputation, and the patient is still alive. There were 3 relapses among cordomas, and all led to death. Both cases of osteosarcoma evolved with metastases and death. The functional score (MSTS) of the patients that survived is, in average, 79% in the 9 patients who underwent some form of resection and 94% in the 8 that underwent aggressive curettage. Despite complications, challenge for the limb preservation is worth if we take into account the very good functional outcome of the surviving patients.

Date: 2017-11-30

Session: Tumours & Miscellaneous Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47328

**THE DUAL MOBILITY CUP IN MUSCULAR SKELETAL ONCOLOGY:
RATIONAL AND INDICATIONS**

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Purpose: the hip is a frequent site for primitive e secondary tumors. For primitive bone tumors the mainstay of treatment is wide resection and reconstruction with a mega-prosthesis; for secondary tumors we can identify both wide resection and endomedullary locked nail. Because of the improvement of survival, resection and reconstruction with mega-prosthesis is more and more widespread. Wide resection often causes joint instability so prosthetic reconstructions present a higher risk of dislocation than in primary osteoarthritis cases. The aim of the present paper is to classify the indications for the dual mobility cup (DMC) hip prosthesis based on the anatomic structures involved in the disease and to analyze the rationale to reduce the risk of dislocation. **Methods:** based on all the cases where a DMC prosthesis was used for reconstruction after hip resection in an oncological research hospital, indications were analyzed and classified. **Results and Conclusion:** four classes of indications were identified; for classes I and IV the indication for DMC prosthesis can be considered strong; for classes II and III the indications must be evaluated considering the specific cases, based on life expectancy, performance status, presence of osteoarthritis, availability of adjuvant local therapies. When a DMC prosthesis is indicated, the cup should always be cemented, alone or with augmentation techniques, to decrease the risk of mobilization due to local disease progression.

Date: 2017-11-30

Session: Trauma Short Free Papers

Time: 16:00 - 17:30

Room: 10. Room 1.64

Abstract no.: 47680

**FACTORS ASSOCIATED WITH TREATMENT FAILURE OF ASEPTIC
TIBIAL NONUNIONS MANAGED BY CIRCULAR EXTERNAL FIXATION**

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Background: Tibial nonunions pose significant treatment challenges despite the regularity with which they are encountered. While several studies have reported the outcome of treating different nonunion subtypes with various strategies, few have investigated the factors that influence treatment and outcome. Aims: This study aims to identify factors that complicate the management of uninfected tibial nonunions and are associated with failure of treatment. Materials and Methods: We retrospectively reviewed all patients with uninfected tibial nonunions who were treated according to a standardized treatment algorithm over a 5-year period. Results: The final cohort consisted of 84 patients with a mean age of 36.5 years (range 5–68 years). Bony union was achieved in 79 out of 84 (94%) tibias. Malalignment ($P < 0.001$), smoking ($P = 0.008$), alcohol use ($P = 0.039$), and time from injury to nonunion management ($P = 0.003$) were found to be associated with treatment failure. The factors found to be associated with increased treatment complexity were smoking ($P = 0.035$), alcohol use ($P = 0.011$), and time from injury to nonunion management ($P < 0.001$). Conclusion: General orthopedic surgeons should, therefore, refer these patients to reconstructive surgeons as soon as the diagnosis of a tibial nonunion is made while reconstructive surgeons should note the importance of host optimization and mechanical alignment during the management of these conditions.

Date: 2017-11-30

Session: Trauma Short Free Papers

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Room: 10. Room 1.64

Abstract no.: 46829

STUDY OF MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS IN FRACTURES OF DISTAL END TIBIA

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Introduction: Fractures around distal tibia constitute up to 5 – 10%. Challenges include poor soft tissue coverage, wound healing problems. Minimally invasive plate osteosynthesis addresses these challenges, along with good functional outcomes. Methodology: Prospective analysis of forty patients with fracture of distal tibia treated with minimally invasive plate osteosynthesis with the use of pre-contoured locking plates were evaluated with follow up upto two years. Results: Forty patients in an age group from 23 to 60 years with the mean age of 43 years. The pattern of fractures in twenty three patients was AO Type – A1, in thirteen patients – AO Type – A2, in four patients were AO – Type A3. Duration for bony union was less than 10 weeks in twenty four patients(60%), 10 – 12 weeks in twelve patients(20%), 12 – 14 weeks in three patients (7.5%).Mean range of motion at the ankle joint was 25 degrees of dorsiflexion and 38 degrees of plantar flexion. Functional outcome assessed using Tenny and Wiss clinical rating system at the end of two year post operative period had fifteen patients (37.5%) with “ Excellent “ outcome, Eighteen patients (45%) had “ Good” outcome, six patients (15%) had a “Fair” outcome and one patient(2.5%) had “Poor” outcome. The average duration of surgery was 73 minutes. The mean blood loss during surgery was around 75 ml. Conclusion: Minimal invasive plate osteosynthesis with precontoured locking plates for distal tibia fractures is associated with good functional outcomes.

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Abstract no.: 46777

THE FLOATING KNEE INJURIES IN ADULTS: TWENTY SIX CASES OF IPSILATERAL FRACTURES OF THE FEMUR AND THE TIBIA OUTCOME

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We evaluated ipsilateral femoral & tibial fractures in adults, and the effects of both fracture type and severity of skeletal injury on the results, irrespective of type of fixation used. The study included 26 patients (25 men, 1 women). According to the classification by Blake & McBryde the types of the fractures were: type I (6), type 2 (20), type 2A (17), type 2B (3). Femur fractures were treated by locked nails, plates, LRS external fixator, and tibia fractures by LRS External Fixator, plates, locked nailing, Illizarov, with or without Bone Grafting, and if needed corticotomy, distraction osteogenesis and bone transport. The mean follow-up was 2.5 years. According to the criteria by Kalstrom and Olerud, the results were excellent in four patients, good in seven patients, acceptable in nine patients, and poor in six patients. Patients having good and excellent results were having either closed or Gustuilo I or II open injuries and patients having fair and poor results all were Gustuilo III A or more. Thirteen patients had at least one complication. Patients with type 2B and those with Gustuilo 3A and above are more likely to have fair or poor results due to the open fracture and to increased involvement of the knee and other joints. Although there is not an ideal method, rigid internal fixation seems to be more appropriate in fractures other than type 3 open fractures. LRS or Illizarov can be used in case of massive bone loss for distraction osteogenesis and bone transport.

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Abstract no.: 46773

OUTCOME OF VALGUS REDUCTION IN TROCHANTRIC FRACTURES- A STUDY OF 90 CASES.

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Introduction: DHS remains the implant of choice in peritrochanteric fractures because of its favorable results and low rate of non-union or hardware failure. Despite the widespread use of DHS, cut out rates of 5-17% have been reported in the literature. The present study was conducted to evaluate the outcome of valgus reduction in intertrochanteric fractures fixed by 1350 DHS and to correlate its influence on TAD and trabecular angle and possible anisomelia. Materials and methods: 90 cases of peritrochanteric fractures (51 males and 39 females) with mean age of 65.4 years were treated with valgus reduction and internal fixation with DHS. Mean follow up was 28.03 months. Results: The mean neck shaft angle of hip was 1290, the mean trabecular angle was 1590 in contralateral hip. The mean neck shaft angle of operated hip was 1380, the mean trabecular angle of operated hip was 1620 at final follow up. 61 patients had TAD index greater than ideal (<25mm) and mean TAD index was also found to be high (26.5mm). Union was achieved in all the patients. The average time of union was 9.3 weeks. No patient had cut out or implant failure. 75 patients had limb length equalization and 10 had shortening and five had limb lengthening at final follow up. Average Harris hip score was 92.1 Conclusion: We advocate valgus reduction of peritrochanteric fractures to achieve reliable functional and radiologic outcomes in peritrochanteric fractures. Valgus reduction reduces the chance of shortening of the leg, and prevents implant cut out

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Abstract no.: 46522

**RETROSPECTIVE COMPARISON BETWEEN SURGICAL OUTCOMES OF
COMMINUTED SUBTROCHANTERIC FRACTURES OF FEMUR-
TREATED BY NAILING VS. BIOLOGICAL PLATING**

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Comminuted subtrochanteric fractures of femur usually result from high-energy trauma. These are challenging injuries, because reduction and alignment of the fracture fragments may prove very difficult. Overenthusiastic open reduction for anatomic reconstruction of these fractures may lead to extensive dissections and periosteal stripping and ultimately end up in complications. The frequently witnessed complications are malunion, nonunion, delayed union, infection and implant failure etc. More and more comparative studies are necessary to understand these fractures and their ideal management. Eighty seven cases of comminuted subtrochanteric fractures were retrospectively analysed; out of them 48 fractures were managed with intra-medullary nailing following either open or closed reduction manoeuvre and 39 were treated with minimal invasive biological plating technique between May 2011 to February 2015 at a tertiary care hospital. Factors like duration of surgery, blood loss, time to union and weight-bearing, complications and functional outcomes of both groups were studied and compared. Eighty two patients were available for outcome evaluation with a minimum two-year's follow-up. The functional evaluation was done by LEFS scoring system. The nailing group was found to have significantly more number of delayed union, nonunion, implant failure and secondary surgeries like bone grafting and re-fixation. But there was no significant difference in the functional outcome score between the two groups after a minimum of two-year's follow-up. Intra-medullary nailing may not always yield desirable results in comminuted subtrochanteric fractures. Closed reduction followed by biological plating has shown very good promise in minimizing the post-operative complications in these fractures.

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Abstract no.: 48529

ANALYSIS OF DISTAL LOCKING PATTERNS IN INTRAMEDULLARY NAILING IN DISTAL TIBIA FRACTURES- A RETROSPECTIVE STUDY

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Introduction: Distal tibia extraarticular fractures pose challenge to definitive fixation with intramedullary nailing. With advances in instrumentation, indigenous distal tibia nails having multiple locking options in different planes have been introduced. Twenty cases were analysed to assess optimum locking configuration. Methods: This was a retrospective study. Data was retrieved from hospital records and follow-up in out-patient department. Cases were divided into 3-locking pattern types: Type-A:2-mediolateral screws, type-B:2-screws(1-mediolateral and 1-anteroposterior) and type-C:3-screws (2-mediolateral and 1-anteroposterior). Following parameters were assessed- time to union and weight-bearing, tibial angulation and rotation, distal locking screw prominence and complications if any. Results: Twenty cases were evaluated. There were fourteen males and six females. Type-A distal locking pattern was present in 11 cases; Type-B locking pattern in 4 cases and Type-C pattern was found in 5 cases. Average operating time was 92.6 minutes. Average time to union was 16.2 weeks. Toe-touch-down weight bearing was started in all cases in immediate post-op period. There was no clinically significant tibial malalignment or malrotation. Screw prominence was noted in 4 cases. These were removed after fracture union. There was one superficial infection which resolved with oral antibiotics. No implant failure or breakage was noted in this series. Conclusions: Newer specific distal tibial nails add versatility to treatment of such fractures. Different locking screw patterns do not translate into statistically significant difference. Two-screw pattern reduces exposure to radiation and surgical time. Use of more than two screws is doesn't appear necessary unless there is difficulty in putting first 2-screws.

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Abstract no.: 47286

SURGICAL TREATMENT OF SEGMENTAL TIBIAL FRACTURES: DOES MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS YIELD BETTER ALIGNMENT THAN INTRAMEDULLARY NAILING?

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Introduction: This study was undertaken to compare the outcomes and complications between intramedullary nailing (IMN) and minimally invasive plate osteosynthesis (MIPO) in the treatment of segmental tibial fractures. **Methods:** Fifty-five cases with segmental tibial fractures who underwent surgical treatment of either IMN (n=20) or MIPO (n=35) were reviewed. Radiologic assessment with bony union and alignment was performed. Functional assessment was carried out by Knee society score and American Orthopedic Foot & Ankle Society (AOFAS) score. Complications including nonunion and infection were also analyzed. **Results:** In IMN group, primary bony union rate was 85% (mean 18.4 weeks), and that of MIPO group was 85.7% (mean 19.5 weeks). We could not discover a significant difference in the union rate and union time between 2 groups. The incidence of malalignment was significantly higher in IMN group (60%) than in MIPO group (31.4%) ($p=0.039$, Chi-square test). Mean knee society score in IMN group was 94.1 and that of MIPO group was 93.5 ($p=0.711$, independent t-test). Mean AOFAS score in IMN group was 92.4 and that of MIPO group was 91.5 ($p=0.607$, independent t-test). There showed deep infection rate of 5% in IMN group and 5.7% in MIPO group ($p=0.402$, Fisher's exact test). **Conclusion:** Our findings demonstrate that both IMN and MIPO yield satisfactory outcome in terms of bony union and functional assessment for the treatment of segmental tibial fractures. Nevertheless, MIPO is thought to be a way to reduce the possibility of malalignment rather than IMN.

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Abstract no.: 47284

AUGMENTATIVE INTERLOCKING SCREWS WITH EXCHANGE NAILING IMPROVES THE HEALING IN THE INFRA-ISTHMIC NONUNION OF FEMORAL SHAFT

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Exchange nailing after reaming has been a procedure of choice for the treatment of aseptic nonunion of femoral diaphysis. However, several factors are known to exert adverse effect to the outcome with this technique. The purpose of this study was to evaluate the potential risk factors of failure after exchange nailing for femoral diaphyseal nonunion. Thirty consecutive, aseptic nonunions of femoral diaphysis presented with a nail in situ (isthmic: n=15, infra-isthmic: n=15) with an average of 67 weeks, were retrospectively reviewed. A nail at least 2 mm larger in diameter than the previous nail was used, without any additional procedures such as bone grafting, dynamization, or augmentative plating. Interlocking was done in static mode, while fixing three or more interlocking screws at the distal segment in infra-isthmic nonunion. In primary outcome, the radiographic and clinical evidence of healing of nonunion and time to union were measured. Possible adverse factors were analyzed as a secondary outcome. Twenty-eight of 30 femoral nonunions (93.9%) healed after exchange nailing. The average time to achieve union was 23.1 weeks (range, 13.7-36.7). There were two failures in isthmic nonunions, while all infra-isthmic nonunions were united. These were two out of ten nonunions with 2 distal interlocking screws, while all with 3 or more distal interlocking screws were healed successfully. Exchange nailing for the treatment of aseptic nonunions of femoral diaphysis can achieve a very high healing rate. Three or more interlocking screws may be helpful to gain the further stable construct in infra-isthmic nonunions.

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Abstract no.: 47283

EVIDENCE-BASED SIMULATION OF HIP FRACTURE SURGERY

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INTRODUCTION: Hip fracture surgery simulation has been shown to be able to discriminate between novices, intermediate and expert surgeons. However, an evidence-based mastery learning program has not yet been developed. The aim of this study was to establish the learning curve cumulative summation test (LC-CUSUM) with clear pass/fail standards in hip fracture surgery simulation. **METHODS:** Prospective observational study. Novices and experts performed dynamic hip screw surgery utilizing haptic 3D simulator TraumaVision. Thirteen successive passed procedures were required at each of the 3 competency levels before moving on to the next level: (1) guide wire insertion, (2) guide wire + clinical variability (3) full DHS procedure incl. clinical variability. Failure was punished by requiring 7 additional passed procedures. These LC-CUSUM characteristics ensure a minimum 90% succession rate for the participants, who successfully complete the simulation course. **RESULTS:** All experts and 80% of the novices successfully completed the simulation course. The tip apex distance was 14mm (95%CI 12-16) by the end of the course in both groups ($p=0.9$). However, time to completion varied from 31min for 48 procedures from the fastest expert to the slowest novice with 268min for 91 procedures. The difference in mean times and procedures was highly significant ($p<0.01$). Furthermore, experts used significantly less radiographs than novices, factor 2.5 (2.2-2.9), $p<0.05$. **CONCLUSION:** The simulation course revealed significant differences between novices and experts. Furthermore, some novices did not successfully complete the course and further simulation training or a higher degree of supervision may be advisable before clinical practice.

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Abstract no.: 47108

USE OF FASCIOTOMY IN CLINICALLY-SUSPECTED COMPARTMENT SYNDROME FOLLOWING SNAKEBITE

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Background: Compartment syndrome is an uncommon but serious complication of venomous snakebite. However, snakebite can clinically mimic this condition without causing a significant pressure rise in the muscular compartment. Fasciotomy may be inappropriate and even harmful in these cases, with an accompanying venom-related coagulopathy often present. This review examines the variations in criteria used to determine whether to perform fasciotomy in a painful, swollen limb following snake bite. Methods: Systematic review of Pubmed was performed using the following search strategy: snake*[Title/Abstract] AND compartment syndrome[Title/Abstract], limited to studies published in the last ten years. Results: Nineteen relevant articles identified. 42.1% used clinical assessment alone or advised that clinical assessment alone can be sufficient to determine whether fasciotomy is indicated following snakebite. 57.9% consistently used direct intracompartmental pressure measurement to guide this decision, but threshold values varied widely. 10.5% reported using additional tests as adjuncts. Conclusions: There is clear evidence that using clinical judgement alone in this context results in a higher rate of fasciotomy than where direct intracompartmental pressure measurements are taken. The fact that a proportion of centres in both developed and developing nations are omitting to use this diagnostic tool suggests that a burden of excess morbidity exists. Education about the use of pressure measurement, optimisation of medical management, and the specific risks of surgical intervention following snakebite is likely to improve outcomes for snakebite victims who show clinical signs consistent with compartment syndrome.

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Abstract no.: 48494

INSUFFICIENCY FRACTURES- A NOVEL DIAGNOSTIC AND TREATMENT ALGORITHM.

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Method: Typically patients presented with continuous pain at multiple sites (hips, pelvic region and other weight bearing areas being common), sedentary lifestyle, morbid obesity (BMI>30) and obvious stress. These patients were subjected to blood investigations to check for PTH and Serum vitamin D levels (suspecting insufficiency disease) besides ESR, liver functions and renal functions were also done to ascertain the root causes (suspecting multiple myeloma or malignancy). A skeletal survey using digital radiographs involving the painful sites were undertaken. Treatment of insufficiency fractures usually consisted of conservative measures, including pain control, limited weight-bearing and gradual physical rehabilitation. Healing was typically achieved within four months. If serum vitamin D levels were low or raised PTH levels alone was found, vitamin D supplementation, avoidance of stressful activity, lifestyle modification and treatment of the root cause was instituted. On the other hand if low vitamin D levels and raised PTH levels were coupled with raised ESR, serum alkaline phosphatase and suspicion of fractures on radiographs, then a PET SCAN was undertaken. Serum protein electrophoresis was done when multiple myeloma was suspected. An MRI was also necessary to rule out malignancy and extent of soft tissue involvement. **Results:** A novel treatment algorithm was formulated on the basis of the following results ranging from diagnosis to treatment of insufficiency fractures. **Implication:** This study aims to achieve standardization in diagnosis and treatment of insufficiency fractures by proposing a novel treatment algorithm for insufficiency fractures. This in turn can be incorporated in our future strategy.

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Abstract no.: 46645

HOW EFFECTIVE IS CONSENT TRAINING FOR NEW ORTHOPAEDIC TRAINEES?

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Introduction: The consent process forms a crucial part of surgical care and the ability to gain valid consent ensures the patient is suitably informed of the risks and benefits of the procedure. The recent Montgomery ruling has further highlighted the need to gain adequate consent. In addition, new surgical trainees may feel uncomfortable and underprepared for the task of consenting. The aim of this study was to assess the competency and self-rated ability of new orthopaedic trainees to consent for common trauma operations. Methods: Initially both an audit analysing the quality of consent against British Orthopaedic Association and General Medical Council guidelines was performed. Secondly, new orthopaedic trainees were asked to complete a questionnaire assessing their knowledge of the consent process and guidelines, training they had previously received and how comfortable they being asked to consent patients. Subsequently specific consent training targeted at these junior surgeons was carried out before the questionnaires and audit were repeated. Results: Significant improvements were seen in quality of the written consent forms after training. The questionnaire revealed that 92% found the training beneficial and the proportion who felt uncomfortable consenting reduced from 45% to 12%. The understanding of GMC guidance and Montgomery ruling increased from 36% and 9% to 84% and 76% respectively. Conclusion: The consent process is poorly understood and executed by new surgical trainees. Targeted training has been shown to improve their knowledge, performance and confidence in performing this task.

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Abstract no.: 46610

**PRELIMINARY RESULTS WITH THE USE OF POLYLACTIC ACID (PLA)-
ANTIBIOTIC COATED NAIL IN OPEN TIBIAL SHAFT FRACTURES**

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INTRODUCTION: To study infection rates, radiological outcome (union) and functional outcome in open tibial shaft fracture cases managed with polylactic acid (PLA)-antibiotic coated nail. **METHODS:** 54 patients underwent debridement of wound, followed by open reduction and internal fixation with PLA-antibiotic coated nail (CE-certified, OSSIPRO, MatrixTM). The fully resorbable antibiotic coating consisted of polylactic acid matrix containing gentamicin sulphate. The thickness of antibiotic coating was 10 micrometers. Total drug in average size nail was 50 mg. **RESULTS:** 50 patients (40 open grade 2, 10 open grade 3a, Gustilo-Anderson classification) completed the minimum follow up of 6 months. Infection rate overall was 8% (4/50) (grade 2; 0% {0/40}, grade 3a; 40% {4/10}, P value 0.001). Union rate overall was 80% (4/50) (grade 2; 90% {36/40}, grade 3a; 40% {4/10}, P value 0.002). PCS (SF-36 score) at 6 months of follow up was 55.2 ± 20.10 (grade 2; 58.95 ± 9.99 , grade 3a; 40.19 ± 16.37 , P value 0.002) whereas MCS (SF-36 score) was 54.96 ± 23.5 (grade 2; 57.96 ± 16.63 , grade 3a; 42.94 ± 23.75 , P value 0.04). Infection rates reported in literature with the use of standard tibia nail are 3.5-10% and 5.1-15% for open grade 2 and grade 3 fractures respectively. **CONCLUSION:** The use of PLA-antibiotic coated nail in our study has shown promising results in open grade 2 fractures but not in grade 3 fractures. However, a larger sample size and a longer follow up would be required to further determine the usefulness of this implant.

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Abstract no.: 46303

THE ROLE OF BMP-7 IN OPERATIVE TREATMENT OF ASEPTIC LONG BONE NONUNIONS

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Introduction: Our surgical revision concepts for the treatment of aseptic humeral, femoral, and tibial diaphyseal nonunion were evaluated. It was determined if nonunion healing occurred more frequently, if time to bone healing was shorter, and if clinical and radiological outcome was better following application of additional recombinant human Bone Morphogenetic Protein-7 (BMP-7) compared to no BMP-7 use. **Methods:** Between 06/2006 and 05/2013, 112 patients were treated with the diagnosis of aseptic diaphyseal humeral (22 patients), femoral (41 patients), and tibial (49 patients) nonunion using rigid internal fixation and autologous bone grafting. Additional biological augmentation with BMP-7 was applied in 62 patients. Clinical and radiological follow-up was performed at least 12 months after revision surgery in accordance with the DASH Outcome measure in the humerus, the LEFS Score in femur and tibia, and the SF-12 for all entities. **Results:** One hundred and two out of 112 (humerus: 19, femur: 37, tibia: 47) nonunions healed within 12 months after revision surgery without any significant differences between the cohort groups. According to the DASH Outcome Measure in the humerus ($p=0.679$) and to the LEFS in the femur ($p=0.251$) and in the tibia ($p=0.946$) as well as to the SF-12 for all entities no significant differences between the cohort groups were found. **Discussion:** Aseptic long bone nonunion in humerus, femur, and tibia healed irrespective of additional BMP-7 application. For successful treatment, vital bone ends and internal stable fixation is necessary to gain a high degree of rigid stability.

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Abstract no.: 48355

COMPARATIVE STUDY BETWEEN MINIMALLY INVASIVE PLATE OSTEOSYNTHESIS AND OPEN REDUCTION FOR DIAPHYSEAL FRACTURE OF THE HUMERUS

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Introduction: Standard procedure for any shaft of humerus fracture has been open reduction and internal fixation (ORIF). Due to various complications such as infection, delayed union, implant failure because of non-union and radial nerve injury has brought the minimally invasive plate osteosynthesis (MIPO) technique into the forefront as it is more biologically acceptable. Material and methods: 22 patients with various patterns shaft of humerus fractures were evaluated and managed with either MIPO technique or ORIF between October 2015 to January 2017. 10 patients were managed with ORIF and 12 patients were managed with MIPO. Gender ratio, surgery time, radiation exposure, fracture union time and complications were studied. UCLA shoulder and MAYO elbow scores were used for evaluating post-operative outcome. Results: Out of 22 patients 14 were males and 8 were females. Mean surgical time for MIPO was 64min and for ORIF 114min. The mean fracture union time was 10 weeks for MIPO and 12 weeks for ORIF. One patient in each group had superficial infection whereas deep infection was seen in one case of ORIF group. Shoulder function was good to excellent in 19 patients and fair in 3 patients. Conclusion: This study showed a faster union time and lesser complications in cases with MIPO. Although in simple transverse fractures ORIF gave a better union time, comminuted fractures managed with MIPO had better results. Hence MIPO is a simple, less time consuming technique for shaft fractures and should be considered as an alternative to ORIF.

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Abstract no.: 46982

RADIOLOGICAL CORRELATION TO THE FUNCTIONAL OUTCOME IN PROXIMAL HUMERUS FRACTURE MANAGED WITH INDIRECT REDUCTION & FIXATION WITH PLATE AND SCREWS

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Purpose:To evaluate the surgical reduction accuracy based on radiological parameters to the functional outcome. **Methods:** 33 patients with mean age of 50.3yrs having displaced three (15) and four (18) part fractures, underwent fixation with plate and screws with minimum follow up of two years were analyzed. Surgical technique involved single surgeon and Indirect reduction and fixation. 17 patients had PHILOS (AO) plate and 16 had T Buttress plate fixation. Radiological parameters studied were Head shaft angle, offset and the distance of greater tuberosity to articular margin. The functional outcome evaluated by DASH and Constant Score. **Results:**All patients had union in 14 weeks without infection. Varus collapse seen in 2 patients. Asymptomatic Avascular necrosis seen in 1 patient. Average neck shaft angle was 36.7 (19.3 to 59), Lateral offset of 59.23 (47.55 to 72.67) and the distance of greater tuberosity to articular margin was 8.14 (3.24 to 17.28). All these indicated good alignment. However only 20 patients (61%) had abduction above 90 degrees. With DASH scores (Avr 13) and Constant score (Avr 82) had good to excellent outcome. **Conclusion:** Surgical technique to get near normal radiological outcome gives good to excellent functional results. Only 61% had abduction above 90 deg which indicates the need for assessing the integrity of rotator cuff.

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Abstract no.: 46589

UNBLINDED RANDOMIZED CONTROL TRIAL ON PROPHYLACTIC ANTIBIOTIC USE IN GUSTILO II OPEN TIBIA FRACTURES AT KENYATTA NATIONAL HOSPITAL, KENYA

Joshua Nyaribari ONDARI

University of Nairobi, NYAMIRA (KENYA)

Objective: To determine the difference in infection rate between 24 hours versus five days of prophylactic antibiotic use in management of Gustilo II open tibia fractures. **Design:** Unblinded randomized control trial. **Setting:** Accident and Emergency, orthopedic wards and clinics at Kenyatta National Hospital (KNH). **Patients:** The study involved patients aged 18 to 80 years admitted through accident and emergency department with Gustilo II traumatic open tibia fractures. Patients were randomized into either 24 hour or five day group and antibiotics started for 24hours or five days after surgical debridement. The wounds were exposed and scored using ASEPSIS wound scoring system for infection after 48 hours, 5 days and at 14 days. The main outcomes of interest were presence of infection at days 2, 5 and 14 and effect of duration to antibiotic administration on infection rate. There was no significant difference in infection rates between 24-hour and 5-day groups with infection rates of 23% (9/40) vs. 19% (7/37) respectively ($p = 0.699$). The infection rate was significantly associated with time lapsed before administration of antibiotics ($p = 0.004$). **Conclusion:** In the use of prophylactic antibiotics for the management of Gustilo II traumatic open tibia fractures, there is no difference in infection rate between 24 hours and five days regimen but time to antibiotic administration correlates with infection rate. Antibiotic use for 24 hours only has proven adequate prophylaxis against infection as underlined in our study which hopefully shall change practice. A larger, more appropriately controlled study would be useful.

Date: 2017-11-30

Session: Trauma Short Free Papers

Time: 16:00 - 17:30

Room: 10. Room 1.64

Abstract no.: 46558

POLYTRAUMATIZED PATIENTS WITH SEVERE CHEST TRAUMA - CLUB CELL PROTEIN 16 AND CYTOKERATIN FRAGMENT 21-1 MAY PREDICT PULMONARY COMPLICATIONS

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Objective: To test if biomarker levels assessed shortly after trauma may predict the occurrence of acute respiratory distress syndrome (ARDS) and pneumonia in polytraumatized patients with severe chest trauma. **Methods:** In polytrauma victims (ISS \geq 16, AISThorax \geq 3) of at least 18 years of age, who were directly admitted to our level I trauma center within the first posttraumatic hour and who survived their injury for at least 24 hours, the levels of five selected biomarkers were assessed at admission and on day 2 after trauma. For the initial and the follow-up levels of each biomarker comparison of medians, logistic regression analysis, and ROC statistics were performed. **Results:** Within a time period of four years 101 patients (mean age, 40.3 years; mean ISS, 33.7) met the inclusion criteria. 35 patients developed ARDS, 30 pneumonia and 21 both. Regarding ARDS initial levels of Cytokeratin fragment 21-1 (CYFRA21-1), and of the Club Cell Protein 16 (CC16) provided significant results in each statistical analysis, whereas even each analysis supplied significant results for pneumonia and levels of CYFRA21-1 and CC16 at both time points. CYFRA21-1 levels exceeding cut-off value of 1.85 ng/ml and 2.49 ng/ml in the serum shortly after polytrauma may identify patients at risk of ARDS and pneumonia, respectively. However, CC16 levels exceeding 30.51 ng/ml on day 2 after trauma may allow a firmer prediction for the development of pneumonia. **Conclusions:** Initial CYFRA21-1 levels were identified as most promising predictor of ARDS, follow-up CC16 levels have to be considered as most appropriate for predicting pneumonia.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46948

DRIVING SAFETY AFTER SPINAL SURGERY- SYSTEMATIC REVIEW

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Introduction: The driving reaction time is defined as the amount of time, at which a driver can adequately react to a stimulus requiring them to brake emergently. Although, DRTs can vary depending on variables such as mental processing time, movement time, and device response time. There are standard or safe ranges quoted in the literature. Thus, a standardized postoperative DRT might represent an objective indicator for when a patient can resume safe driving after spinal surgery. The aim was to assess (DRTs) after spinal surgery, to establish a timeframe of when postoperative patients can safely resume driving. **Methods:** The MEDLINE and Google Scholar databases were analyzed according to the PRISMA statement for clinical studies investigating changes in DRTs following cervical and lumbar spinal surgery. Changes in DRTs and patients' clinical presentation, pathology, anatomical level affected, number of spinal levels involved, type of intervention, pain level, and driving skills were assessed. **Results:** The literature search identified 12 studies addressing DRTs in postoperative patients; of those studies, 6 studies met the inclusion criteria. Amongst these 6 studies, 5 after lumbar spine surgery and 2 after cervical spinal surgery. The spinal procedures were: selective nerve root block, anterior cervical discectomy and fusion, and lumbar fusion and/or decompression. Overall, DRTs exhibited variable responses to spinal surgery dictated by the patients' clinical presentation, spinal level involved, and the type of procedure performed. **Conclusions:** The evidence regarding patients' ability to resume safe drive after spinal surgery is scarce. Normalization of DRT or returning to pre spinal intervention values represents a widely accepted indicator for safe driving.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46804

METAL RELEASE FROM SPINE INSTRUMENTATION AND THE LOCAL TISSUE REACTION

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Metallosis describes tissue staining, however it is not a clinically relevant definition. Through failure analysis, sources of metal from spine implants are identified and combined with histology; tissue metal concentration measurements; and patient outcomes, metallosis can be relevantly defined. Explanted hardware is documented and inspected for signs of wear and corrosion. Peri-implant tissue samples are collected for histology and ICP-MS/AES analysis. Data from the first five (5) patients of this ongoing program are presented herein. Fretting wear and pitting corrosion was found on all explanted rods and within the tulips of pedicle screws. All stained tissue samples appear fibrotic with areas of scarring and trapped histiocytes surrounding foreign material. Some foreign body giant cell reactions are present. A single patient had mixed CoCr and Ti6Al4V hardware (N=1) and tissue Cr and Co levels were higher (263.2 µg/g and 585.7 µg/g respectively) than published ICP studies on normal muscle tissue (Cr) 0.03 µg/g and (Co) 1.35 ± 1.97 µg/g. In all patients (N=5), mean Ti, Al, V, concentration increased (1537.0 ± 2513.1 µg/g; 110.6 ± 175.8 µg/g; 63.7 ± 117.9 µg/g respectively) compared to published literature normal tissue levels: (Al) 8.4 ± 4.8 µg/g; (Mo) 1.61 ± 1.41 µg/g; (V) 0.06 ± 0.03 µg/g respectively. A "normal" ICP reference titanium level could only be found for whole blood, 0.00072 ± 0.1412 µg/g. Corrosion and wear leads to increases in metal ion concentration in the surrounding tissue possibly supporting a link to poor health outcomes due to a chronic inflammatory response.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47013

AN ATYPICAL CASE OF TUBERCULOSIS OF THE POSTERIOR ELEMENTS OF T2 AND T3 WITHOUT INVOLVEMENT OF THE VERTEBRAL BODIES

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Case: Isolated Mycobacterium tuberculosis (TB) infection of the posterior element of a vertebra is rare, but timely diagnosis affords an opportunity for treatment before spinal cord compression occurs. A twenty-eight-year-old woman presented with bilateral weakness of the lower extremities. The clinical findings correlated with compressive myelopathy, for which the most likely causes include a primary tumor and infection. The diagnosis of TB was based on the magnetic resonance imaging findings, along with ultrasound-guided aspiration showing necrotizing granulomatous inflammation in a patient at high risk for TB. She was managed conservatively with an antitubercular treatment and achieved a good response at the latest follow-up at one and a half years. Conclusion: Even with symptoms of spinal cord compression, some patients with TB infection of the posterior elements of vertebrae can be managed medically without surgery.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46159

RISK FACTORS FOR CHRONIC BACKACHE IN CIVILIAN AND MILITARY POPULATION. ARE THERE ANY DIFFERENCES?

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Introduction: This study describes the epidemiology of adult backache civilian and military population. There is difference in epidemiology and outcome in these two population. **Material:** In civilian population: 1001 backaches on compensation in New Zealand and 654 in military population in Australia between 2010 and 2015 among individuals aged 16–75 years were considered. They were comprehensively assessed by a single surgeon clinically and with aid of MRI/CT performed in all the cases. Analyzed for 22 different variables and statistical analyzed for probability using Chi Square. **Results:** In civilian group of 1001, 636 were males. There were 188 people who had completed diploma or above qualification. In Military group [DVA] included 654 cases, of which 586 were males. 207 had completed diploma or above qualification. Analysis showed statistical significant observations that chronic backache on: educational status, smoking, psychological factors [yellow /black flags], number of surgery for back [>2 surgeries] and duration symptoms [>1 year]. Influencing factors for outcome amongst civilian chronic backaches and chronic backaches in military were compared. **Conclusions:** Back impairments are the most common impairment among young and middle-aged people. Among the factors that do not contribute to long-term disability are: sex, residency, drinking, marital status, race, and velocity of injury. Age, Socioeconomic [educational status], psychological factors, smoking and number of surgery for back and duration symptoms can be considered as risk factors associated in Chronic back aches over 6 months. There is difference between epidemiology and outcome factors between Civilian group and military group.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47150

THORACIC MYELOPATHY CAUSED BY COMBINED OSSIFICATION OF POSTERIOR LONGITUDINAL LIGAMENT AND OSSIFICATION OF LIGAMENTUM FLAVUM: CASE SERIES IN A REGIONAL INSTITUTION IN HONG KONG

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Introduction: Symptomatic thoracic stenosis is an uncommon disease in contrast to cervical and lumbar stenosis. Thoracic myelopathy caused by combined ossification of posterior longitudinal ligament (OPLL) and ligamentum flavum (OLF) at the same level is even more uncommon. Methods: All patients with thoracic myelopathy caused by combined OPLL and OLF who underwent operation in our institution between January 2004 and December 2016 were retrospectively reviewed. Neurological status was scored with modified Japanese Orthopaedic Association (mJOA) scale. Results: Eight patients (2 men and 6 women) underwent surgery at the mean age of 52 years (range 31-65). Two patients had single-level involvement. Two patients underwent decompressive laminectomy whereas the others underwent concomitant posterolateral instrumented fusion. Seven patients reported preserved or improved neurological function, from pre-operative mJOA score 5 (range 2-7) to post-operative mJOA score 7.4 (range 5-9). The recovery rate was 40% (range 20-57%). One patient showed neurological deterioration from mJOA score 3 to 2. She received multiple-level decompressive laminectomy without instrumentation. As a result, backward shift of spinal cord was restricted in the presence of thoracic kyphosis. In our series, there was no incidence of intra-operative dural tear. No patient suffered from infection or haematoma formation that required surgical drainage. Conclusion: Diagnosis of thoracic myelopathy tends to be delayed because of its complex neurological manifestations and rarity. Thus, irreversible neurological damage can result. Conservative management has been demonstrated ineffective. However, surgical intervention is not without challenges. In conclusion, combined OPLL and OLF poses significant difficulties in the diagnosis and treatment.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48676

COMPARATIVE EVALUATION OF PERCUTANEOUS ENDOSCOPIC LUMBER DISCECTOMY AND OZONE-AUGMENTED PERCUTANEOUS LUMBER DISCECTOMY FOR THE TREATMENT OF LUMBAR DISC HERNIATION.

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Background:The increased incidence of low back pain has become a public health problem, with it being the most common reason for outpatient and occupational disease. Low back pain can result in incapacitation and decreased efficiency. The degeneration of intervertebral disc tissue can lead to lumbar disc herniation and nerve root impingement, regarded as the major reason for low back pain. Lumbar disc herniation at the L4-L5 or L5-S1 level account for about 90% of cases. **Aim:**To compare percutaneous endoscopic lumbar discectomy (PELD) and ozone-augmented percutaneous lumbar discectomy (OPLD). **Method:**65 eligible cases, divided as 34 cases for PELD and 31 cases for OPLD. Values of the visual analog (VOA) scale and the Japanese Orthopedic Association (JOA) scale were recorded at pre-operation, 2 weeks post-operation and again at 6 months post-operation. The Macnab value was recorded at six months post-operation. Clinical outcomes were evaluated with the analysis of the data from the two groups. **Results:**The cases were all completed successfully sans serious complications. There were significant improvements in VAS at 2 weeks and 6 months than pre-operation ($P<0.05$) for both groups. The PELD group showed statistically significant outcomes in VAS value at two weeks than the OPLD group (4.77 ± 1.08 vs 5.48 ± 0.80). However, there was no significant difference in the VAS value at 6 months. **Conclusion:**There was no difference between the two treatments. In short-term clinical outcome both PELD and OPLD showed favorable outcomes with the PELD group edging the OPLD group at 2 weeks post-operation.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47021

A SURVEY OF THE USE OF TRACTION BY SPECIALISTS FOR THE REDUCTION OF CERVICAL SPINE DISLOCATIONS.

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Introduction: Literature supports early decompression of low energy cervical spine dislocations. Closed reduction can safely and rapidly achieve this. However, its use and acceptance amongst specialists is poorly described. This study aimed to assess the training, experience and decision making of trainees and surgeons who manage cervical spine dislocations with the goal of implementing further training and refresher courses as necessary. Methods: Orthopaedic and neurosurgery registrars and specialists in South Africa were emailed a questionnaire consisting of 13 questions related to their training, experience and management of cervical dislocations. Results: 79% of surgeons were taught closed reduction during specialist training. Of neurosurgeons, 92% covered spine trauma compared to 66% of orthopaedic surgeons. Of surgeons covering trauma, 36% would refer, accepting a 2 hour delay in treatment. 38% of neurosurgeons vs 3% of orthopaedic surgeons preferred MRI before closed reduction. 51% of surgeons thought that the risk of worsening neurology during traction was up to 25%. 69% of surgeons felt ER doctors could safely perform closed cervical reduction with training. 81% of surgeons do not think surgical reduction is routinely possible in under 4 hours. Conclusion: There are some misconceptions around cervical traction which may affect clinical practice and optimum management. It is a safe procedure not requiring prior MRI and carries a low risk of worsening a patient's condition. Closed cervical traction reduction is the most rapid, safe mechanism to reduce cervical dislocations and requires education of undergraduates, emergency doctors, and specialists to increase awareness of the reduction process.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46921

NAVIGATOR-ASSISTED TECHNIQUE OF TRANSFORAMINAL PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY AT L5/S1 LEVEL WITH HIGH CREST: A PROSPECTIVE CONTROL STUDY

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Introduction: Percutaneous endoscopic lumbar discectomy (PELD) is a popular minimally invasive technique for lumbar disc herniation (LDH) in 2 routes, namely transforaminal (TF-PELD) or interlaminar (IL-PELD). In L5–S1 LDH with high crest, large facet joint, narrow foramen, and small disc space. IL-PELD is preferred in practice because anatomic limitations for TF-PELD. However, it remained questionable whether TF-PELD was equivalent or even superior to IL-PELD when navigator-assisted technique combined with foraminoplasty for L5–S1 cases. **Methods:** Navigator-assisted TF-PELD was a validated technique mainly based on isocentric guidance. High iliac crest cases are defined when the iliac crest is above the mid L5 pedicle in lateral radiography. We prospectively evaluated the feasibility of puncture-guided TF-PELD versus IL-PELD in L5-S1 LDH cases between May 2014 and March 2016. **Results:** A total of 66 patients with paracentral or central LDH by a single surgeon were included in this study, while there were 31 cases in TF-PELD group and 35 cases in IL-PELD group. There were no significant differences in preoperative radiographic assessment such as iliac height, iliosacral angle and foraminal height ($p>0.05$). In addition, there were no significant differences in operation time or improvements of patient-reported outcomes including VAS, ODI, MacNab satisfaction between the two groups during the follow-up ($p>0.05$). However, two cases of dural tear were found in IL-PELD group. **Conclusions:** Navigator-assisted technique combined with foraminoplasty was feasible in L5–S1 LDH with high crest, which has equivalent clinical outcomes with IL-PELD but has merits of local anesthesia and non-traction of dura.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46535

LEARNING CURVE FOR MINIMALLY INVASIVE SPINE SURGERIES: A RETROSPECTIVE REVIEW FROM FIVE YEARS OF MISS TECHNIQUE.

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Introduction: There is an inherently difficult learning curve associated with minimal invasive surgical (MISS) approaches to spinal decompression and fusion. The purpose is to identify the learning curve and complications encountered in MISS-procedures (both discectomy and fixations combined together) for spine surgeons. **Methods:** This is a retrospective review of 126 patients operated by the same surgeon during first five years of independently implementing minimal invasive spine surgeries. All surgeries were done by MED (Micro-Endoscopic Discectomy) technique (later on also added with MISS-fixations) between 2011 and 2016. The operative time was sequentially noted. The patients were followed up for clinical results, (VAS) Visual Analogue Score, complications and hospital stay duration. **Results:** Average age was 44 ± 11 years and average operation time was 117 ± 54 minutes. The average surgical time decreased to less than 90 minutes after 30 surgeries. The operative time for MED was around one hour after 50 surgeries and MISS fixations were done in less than 3 hours. After 50 surgeries, the timing for single level discectomy and decompression was less than 60 minutes. Hospital stay was around 3.06 ± 1.38 days. Preoperative VAS-score was 8.6 ± 0.9 v/s 1.8 ± 1.3 ($p < 0.05$) in the postoperative period. Intraoperative and postoperative complications were found in initial 50 surgeries. **Conclusion:** Minimally invasive spine surgeries are procedures with early encouraging results. As per this study, first 30 surgeries should be restricted to MISS decompression and discectomy. Next 20 cases can be combined with some MISS fixations. After the first 50 cases, bilateral decompression with fixation and TLIF (Trans-Foraminal Lumbar Inter-body Fusion) may be successfully attempted.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48516

POSTERIOR HEMI VERTEBRECTOMY IN POST TUBERCULAR SPINAL INFECTION

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All tubercular spine infection heals invariably with kyphotic deformity which causes early or late onset of variable degree of neurological claudication and/or deficit in these patients. This Deformity can be prevented with surgical intervention during healing process. The authors are sharing their experience of preventing the deformity in 7 cases. There was 4 male and 3 female with age ranging from 25 to 37 years. All patients were presented with varying degree of neurological deficit. Posterior half of most affected vertebra was removed. Affected spinal segment was fixed with the transpedicular screws. Transpedicular and posterolateral bone grafting was done. All patients were given bed rest for 6 weeks and anti tubercular treatment (ATT) for one year. All patients recovered neurologically. Infection healed in all cases. Loss of correction was observed in 4 patients varying from 3 to 5 degrees. It is attributed to local osteopenia due to infection. All tubercular spine infection heals invariably with kyphotic deformity. There are mainly two ways to deal with these above mention problems. Either lengthen the anterior segment or shorten the posterior segment are the only solutions to correct the deformity and to maintain the corrected deformity. Posterior hemi vertebrectomy can be done to correct post tubercular kyphosis to avoid early and late onset deformity and to prevent pressure on cord and resultant neurological claudication and/or deficit.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47084

TRANSFORAMINAL PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY FOR DOWN MIGRATED DISC HERNIATIONS: LEVER-UP, ROTATE, AND TILT TECHNIQUE

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Although transforaminal percutaneous endoscopic lumbar discectomy (PELD) offers certain advantages in the treatment of disc herniations, it used to be limited to non-migrated or low-migrated herniations. With improvements in endoscopic spinal surgery, the range of indications for PELD has expanded. Until now, various techniques including transforaminal and interlaminar approaches for migrated disc herniations have been described in the literature. The purpose of this study is to describe a transforaminal PELD approach to effectively address the down migrated intra-canal soft disc herniations using the lever-up, rotate, and tilt technique. Authors performed a retrospective review of 18 patients who had been operated on with the described technique between October 2012 and December 2015. We assessed clinical outcomes using the visual analog scale (VAS) for back and leg pain and Oswestry disability index (ODI) preoperatively at their respective clinical visits and postoperatively at the patients' final follow-up examinations. The mean preoperative VAS scores for back and leg pain were 3.75±1.34 (range 2-6) and 8.3±0.6 (range 8-10), respectively. The mean preoperative ODI was 67.3±15.3 (range 48-90). The mean VAS scores for back and leg pain improved to 1.38±1.58 (range 0-6) and 1.19±0.75 (range 0-3), respectively at the last follow-up. The mean ODI also improved to 14.1±6.2 (range 8-30) at the last follow-up. All differences between the preoperative and last follow-up scores were statistically significant. (p<0.05) Two surgeries failed because of a remnant disc fragment. The lever-up, rotate and tilt technique for transforaminal PELD is an effective maneuver for treatment of down-migrated disc herniations.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48272

**CLINICAL EFFICACY OF MICROENDOSCOPIC LUMBAR DISCECTOMY
COMBINED WITH ANNULUS SUTURE IN THE TREATMENT OF LUMBAR
DISC HERNIATION**

Dadi JIN

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(CHINA)**

Investigate the safety and clinical efficacy of Microendoscopic lumbar discectomy (MED) combined with annulus suture in the treatment of lumbar disc herniation(LDH), and whether it can significantly reduce the recurrence rate after operation. A total of 290 patients with LDH treated with MED from 3. 2012 to 3. 2015. This study included 118 cases of microendoscopic discectomy combined with annulus suture (suture group) and 172 cases of microendoscopic discectomy (control group).The height of disc space were recorded and measured, together with operation time and blood loss. The clinical outcomes were then evaluated by ODI and VAS. In both groups the ODI and VAS scores were significantly decreased in the last follow up, which is statistically significant($P < 0.05$); but no significant simultaneous difference was observed($P > 0.05$) . On average, disc height reduced in the last follow-up, while the difference was not statistically significant between the two groups. The recurrence rate was 8.14% in the control group and 2.54% in the suture group. The reoperation rate was 3.49% in the control group and 0.85% in the suture group . The two groups displayed significant difference in the recurrence rate and reoperation rate. These findings indicate that microendoscopic discectomy combined with annulus suture is simple in operation, safe and feasible. Compared with discectomy alone, additional annulus suture can obtain equivalent and remarkable clinical outcomes. The recurrent rate and reoperation rate can be reduced significantly if the procedure is performed in patients with certain surgical indications.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47991

THERAPEUTIC EVALUATION OF ALIF WITH SELF-STABILIZED CAGE TO TREAT DEGENERATIVE LUMBAR DISORDERS

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To investigate the clinical outcome and surgical technique of the ALIF with self-stabilized cage in lumbar degenerative disorders. 32 consecutive patients aged from 41-66 years old were enrolled in this study. Preoperative diagnosis: lumbar spine instability in 6, discogenic low back pain in 17, degenerative spondylolisthesis in 6, revision for failed posterior lumbar surgery in 3. All of them, 27 cases received single-level fusion, 5 cases received two-level fusion, mini open extraperitoneal approach for L3/4 and L4/5 segments, transverse incision in the right abdomen for L5/S1 segment. Recording the ODI, VAS, height of disc space, angle of disc space, lumbar lordosis, operation time, blood loss, complications, postoperative bed—leaving time and postoperative hospitalization duration. Fusion rate evaluated by CT and X-rays taken routinely during follow up. Average length of incision is 6.5cm, average blood loss is 103ml, mean operation time is 92 minutes, mean postoperative bed—leaving time is 3 days. Complications: peritoneum dehiscence in 3, bone donor site pain in 13. All cases were followed up successfully for an average of 12 months. ODI decreased from preoperative 60.4% to postoperative 21.3%, VAS decreased from preoperative 6.7 to postoperative 2.6. Height of disc space ascended from preoperative 8.2mm to postoperative 13.5mm, angle of disc space ascended from preoperative 10.9° to postoperative 12.3°, lumbar lordosis angle ascended from preoperative 43.6° to postoperative 52.7°. All cases received bone fusion. The clinical outcome of ALIF with self-stabilized cage through mini open extraperitoneal approach to treat lumbar degenerative disorders is satisfactory. The Advantages include less invasive, early ambulation.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47716

EFFICACY OF EXPANSIVE LAMINOPLASTY FOR QUADRIPLEGIC PATIENTS WITHOUT CERVICAL BONY INJURY

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Introduction: The main aim of surgical treatment for cervical injury with spinal cord damage is to maintain a stability of vertebral column by locating damaged spine to normal position and fixing the location to achieve decompression. **Methods:** We picked 38 emergency room patients who showed quadriplegia after trauma between 2003 and 2015. Spinal cord compression was observed on MRI from the patients and expansive laminoplasty was operated on them. Clinical outcomes such as the grade of spinal cord edema on MRI before the operation, postoperative neurological changes, respiration state, complications and survival periods were analyzed. **Results:** The emergency room patients' motor index score was 23 in average (4-30), during follow-up periods the average score was changed to 29 (4-43). There was no significant neurological recovery except two subjects. The average time to have an operation after the injury took 26 hours (9-72 hours). 6 patients showed paradoxical respiration when they first admitted emergency room and the symptom continues after the operation and during follow-up periods. Another 8 subjects showed paradoxical respiration 2 days after the operation due to muscular fatigue. In the follow-up period, 14 patients died due to respiratory failure within 1 year after the surgery. **Conclusions:** It is thought to be the efficacy of expansive laminoplasty for the quadriplegic patients without cervical bony injury is limited. In many patients, no significant neurological recovery was observed but it was clearly identified that prognosis was related to the grades of spinal cord edema and paradoxical respiration.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48492

DOES PRESERVING OR RESTORING LUMBAR LORDOSIS INFLUENCE THE FUNCTIONAL OUTCOME IN LUMBOSACRAL TUBERCULOUS SPONDYLODISCITIS?

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Introduction:In lumbosacral tuberculosis loss of lordosis leads to altered lumbosacral biomechanics. All available studies have assessed treatment outcomes with respect to bone healing, neurological improvement and functional outcomes. But, none have correlated functional outcomes with post-treatment lumbar lordosis. We reviewed 63 patients with lumbosacral tuberculosis, with an attempt to analyse the impact of restoration of global lumbar lordosis (GLL) on functional outcomes. **Methods:**Sixty-three patients with lumbar and lumbosacral tuberculosis were treated conservatively (n=33) or surgically [n=30, debridement with standalone posterior stabilization(n=5), Transforaminal/Posterior Lumbar Interbody Fusion (n=25)] from March 2009 to July 2013. Average follow-up period was 35.2+/-8.7 months. Outcomes were analysed with respect to Visual Analogue Scale(VAS) scores, clinical and neurological improvement, functional outcomes (Oswestry Disability Index), improvement in GLL and radiological evidence of bone healing. Correlation between the final post-treatment GLL and functional outcomes were analysed using Pearson's correlation coefficient. **Results:**All patients showed good bone healing (at 8.4+/-1.5 months), significant improvement in neurology, VAS scores, ESR and CRP, p<0.05. Mean loss of lordosis in conservatively treated group was 6.43+/-5.69 degrees, while lordosis was restored by 12.58+/-7.92 degrees after surgery. Pearson's correlation test showed a strong negative correlation between GLL and degree of disability (r = -0.812, p<0.001). **Conclusions:**Early disease with minimal loss of lordosis, can be managed conservatively, while in advanced disease with gross hypolordosis/kyphosis, posterior stabilization with or without global spinal reconstruction is essential to regain lumbar lordosis. The management of lumbosacral tuberculosis should aim at preserving or restoring the normal lumbar lordosis to achieve good functional outcomes.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47051

TB SPINE IN CHILDREN – RETROSPECTIVE ANALYSIS OF 36 CASES

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INTRODUCTION: Spinal TB in children causes grotesque spinal deformity which continues to increase with growth even after healing. The paucity of followup data on childhood spinal TB exist. We hereby present retrospective analysis of children treated surgically for various indications. **METHODS:** 36 children of spinal tuberculosis with two or more spine at risk signs, aged 2-10 years were operated from 2004 onwards. Besides ATT surgical intervention for deformity correction and/or neurological deficit was performed. The kyphotic deformity was surgically corrected by anterior corpectomy, posterior column shortening, instrumented stabilization (harshill rectangle, n=20) anterior and posterior bone grafting in active disease while pedicle screw fixation (n=6) in partially treated. 6 cases with paraplegia were operated for ALD+ posterior instrumentation, while 4 with healed kyphotic deformity anterior epiphysiodesis. Preoperative and FU modified konstam angle were measured and compared to document progression/improvement in kyphotic deformity **RESULTS:** Dorsal spine was affected in 27 patients while dorsolumbar spine, lumbar and cervical spine in 6, 2 and one respectively. Preoperative mean kyphus was of 45o(21o– 90o) was corrected to 21.7o (5o– 48o) immediate postoperatively and 25.8o (5o–52o) at final FU with 4.1o loss of correction. Mean follow-up was 24 Months (12-72 mos). 5 patients with more than five year FU continued to improve kyphotic deformity even after healing. **CONCLUSION:** The Kyphotic deformity needs surgical correction in children and extrapleural anterolateral approach with Hartshill sublaminar wiring is cost effective method to correct deformity. Deformity may improve with growth hence anterior epiphysiodesis may be advocated in selected cases.

Date: 2017-12-01

Session: Spine Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 46376

**SEVER RIGID SCHEUERMANN KYPHOSIS IN ADULT PATIENTS .
CORRECTION WITH POSTERIOR ONLY APPROACH**

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introduction:Scheuermann kyphosis is a most common structural kyphosis among adolescence and young people. To our knowledge, there is no definite guideline regarding the choice of surgical approach of severe rigid Scheuermann kyphosis. Methods: From 2013 to 2016 all patients whom had been undergone surgical treatment due to severe rigid Scheuermann kyphosis were evaluated prospectively. Results: There were 4 females and 11 males. Mean age of the patients was 22.4 year (range 15 to 38). Mean kyphosis angle before surgery was 87.2 degree (range 76 to 105) . Mean curve size in hyperextension view was 73.8 degree. Mean kyphosis angle after the correction was 47.4 degree (range 40 to 55). Mean correction of curves was 50 to 55 percent of preoperative curves . Mean hospital stay was 3.5 days after the index surgery (range from 3 to 5 days) . Mean blood loss during the surgery was 250 ml which was measured by anesthesiologist. Mean surgical time was 150 minutes (range from 140 to 200 minutes). Mean follow up period was 9 months (range 8 to 48 months) and there was not significant correction loss in their follow up. Conclusion: It seems that the posterior only approach accompanied by new surgical technique and osteotomies result in good result in patients suffering from severe rigid kyphosis.

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47077

**MODIFIED FOUR-IN-ONE PROCEDURE FOR HABITUAL DISLOCATION
PATELLA**

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Introduction: Habitual patellar dislocation is a rare condition affecting children and has bony and soft tissue pathology. We are describing a modified four- in- one technique, which is a soft tissue procedure for the management of combined bony and soft tissue pathology. Method: We included 6 children (4 females and 2 males) with open growth plates, who were diagnosed as habitual patellar dislocation. The average age of the patients was 9.6 years (range 5-13 years). The cases were managed by extensive lateral retinaculum release, medial transposition of lateral half of patella tendon, reconstruction of medial patellofemoral ligament and distal and lateral shift of vastus medialis. We did not use any implant in our surgical procedure. The average follow up period was 12 months (range 7-24 months). Results: There was no recurrence of patellar instability in any of the case. Before surgery, the mean Kujala score was 48 and after the surgical procedure it improved to 95 with average follow up of 12 months. Conclusion: We conclude that our method of treatment of habitual patellar dislocation by using the modified four- in- one technique in children with open physis reproduced excellent functional outcome..

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46972

REPAIR OF INJURED ANTEROLATERAL SECONDARY RESTRAINTS IMPROVES KNEE STABILITY IN ACUTE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Introduction: In order to improve post-operative rotational stability, repair or reconstruction of antero-lateral complex (LC) have been suggested in association with Intra-Articular Reconstruction (IR). The aim of this paper is to report the results of direct repair of acute injuries of LC occurred in apparently isolated ACL tears performed in addition to ACL reconstruction as compared with IR alone. **Methods:** Eighty-nine patients with acute ACL injury were prospectively selected and evaluated at a minimum follow-up of 4 years. Patients were randomly divided in: group I (only IR with hamstrings); group II (repair of LC+IR). Patients were clinically evaluated according to clinical scales and objective score and a side to side Maximum Manual (S/S M/M) arthrometric measurement. **Results:** All subjective scales improved significantly from preoperative evaluation in both groups with no differences between groups. Considering as a failure a S/S M/M difference > 5mm or a Pivot Shift test ++ or a recurrence occurring in postoperative period, we found 7 cases in group I and 1 case in group II. **Conclusion:** Injuries of secondary restraints often occur in cases of apparently isolated acute tears of ACL and that their direct repair results in better stability, lower rate of failure with no negative effect on subjective symptoms (pain and stiffness) as compared with IR alone.

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47386

THE “HUGHSTON PROCEDURE” – TECHNICAL NOTE OF A FORGOTTEN OPTION TO RESTORE ANTEROMEDIAL ROTATORY INSTABILITY OF THE KNEE

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Although surgical techniques for ACL-Reconstruction kept improving during the last decades, failure and recurrent rupture of the graft still are unacceptably common problems. A missed or not addressed injury or a chronic insufficiency of the posteromedial corner of the knee results in anteromedial rotatory instability (AMRI) and might be an essential cause of graft failure after ACL-reconstruction. A surgical technique for repair in acute cases and restoration of its function in chronic injuries was first established by Hughston in 1973. This procedure includes reefing of the POL with suture material and, potentially, use of suture anchors if the tissue is detached from bone. Additionally, the semimembranosus tendon may be advanced anteriorly to improve dynamic stabilization of the PMC. Finally, the loosened posteromedial capsule is advanced anteriorly and sutured under the strong tissue of the superficial MCL. In literature there is no doubt that in cases of severe AMRI an anatomical reconstruction of the PMC should be done. But there are concerns about the morbidity through harvesting a hamstring tendon of a medial unstable knee. At least in a theoretical aspect it seems reasonable to preserve the dynamic stabilizers of the injured knee. There is a lack of comparative surveys especially comparing reconstruction of PMC with repairing these structures. The “Hughston procedure” appears to be useful in cases of moderate posteromedial insufficiency avoiding retrieval of a tendon graft, so it may be indicated in combination with ACL and/or PCL reconstruction.

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 48256

DOES TIBIAL TUNNEL POSITION IN REMNANT-PRESERVING SINGLE BUNDLE PCL RECONSTRUCTION HAVE AN EFFECT ON OUTCOMES?

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Background and purpose: We wanted to know if tibial tunnel position can have an effect on outcomes of patients operated for remnant-preserving single-bundle PCL reconstruction(PCLR). Hypothesis: A lower tibial tunnel can yield significantly better clinical and radiological outcomes than an anatomical tunnel in remnant-preserving single bundle PCLR. Materials and methods: This was a prospective, comparative study on 35 patients with mean age of (40.49±16.67) years and a mean follow-up of 24 months. All patients underwent trans-tibial remnant-preserving single-bundle PCLR. Based on the position of the tibial tunnel, patients were divided into two groups: Group 1(lower tibial tunnel) and Group 2(anatomical tibial tunnel). Results and analysis: The difference in improvement between the two groups was not statistically significant($p>0.05$). On radiological analysis, side-to-side difference in posterior instability between the two groups was not significant at 1-year($p=0.5699$) and 2-years($p=0.7613$) post-surgery. Radiographic progression of osteoarthritis was similar in both groups at 2-years f/up($p=0.4403$). On MRI , group 1 with lower tibial tunnel showed significantly less progression of ICRS grade than the anatomical tunnel group($p=0.0362$). The difference in graft signal intensity between the two groups was not statistically significant($p=1.000$). Patients with lower tibial tunnel showed more graft width in proximal and distal portions($p=0.0625$, 0.077 respectively). Conclusion: On MRI, lower tunnel group showed less ICRS progression and more graft width in proximal and distal portion. However, on 1-year and 2-years follow-up, lower tunnel group did not show any statistically significant better clinical outcome than the anatomical group.

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47166

CURVED DILATOR SYSTEM HAS AN ADVANTAGE OVER REAMER REGARDING TUNNEL ENLARGEMENT AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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When using a suspensory graft fixation device for femoral tunnel, there is a concern of tunnel enlargement after anterior cruciate ligament (ACL) reconstruction. By using a curved dilator system (CDS) for femoral tunnel creation, condensation of bony tunnel wall occurs, which might help in tunnel widening. The purpose was to compare tunnel enlargement between CDS and reamer at 2 years postoperatively. There were 30 patients each in CDS and reamer groups. In reamer group, a reamer with the same diameter as graft was used to create femoral tunnel. In CDS group, the femoral tunnel was widened in a step-by-step manner, starting with a 6mm-diameter dilator and increasing by 1mm, to match the graft diameter. A reamer was used to create tibial tunnels in both groups. The tunnel diameter was measured based on the method by L'Insalata et al. Comparison of tunnel enlargement 2 years after surgery was evaluated as the percentage of tunnel diameter increase compared to immediate postoperative tunnel diameter. Comparisons of tunnel diameter at each time point were evaluated with the ratio of tibial and femoral tunnel diameters. Femoral tunnel widening was significantly less in CDS group at 2 years postoperatively. Tunnel diameter ratio was significantly greater in CDS group immediately after surgery, which could be attributed to serial dilation effect of CDS. However, tunnel diameter ratio was significantly greater in reamer group at 2 years postoperatively. Femoral tunnel creation using curved dilator system resulted in less tunnel enlargement compared to using a reamer after ACL reconstruction.

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46973

SURGICAL TREATMENT OF SEGOND FRACTURES IN ACUTE ACL RECONSTRUCTION

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Introduction: The Segond's fracture is an avulsion-type fracture located on the anterolateral aspect of the tibia associated with a ligament recently termed the "anterolateral ligament". This injury has been described as pathognomonic for an ACL tear. The purpose of this study was to present and report two year clinical outcomes of a surgical technique for acute ACL reconstruction with fixation of a concomitant Segond's fracture. **Methods:** This retrospective study involved twelve patients who underwent acute reconstruction for complete ACL tears with concomitant Segond fracture. Patients underwent direct Segond fracture repair by either suture alone, suture anchor or cannulated screw fixation based on the size of the lesion. Pre- and postoperative KT-1000, Lachman test, and pivot shift test were performed. **Results:** Side to side anterior laxity was significantly improved in all patients. Pivot shift disappeared after fixation in all but one patient who maintained a 1+. Lysholm, Tegner, and IKDC subjective and objective scores were significantly improved. At a minimum 2 year follow-up, no patient reported re-rupture, and only one patient (8%) underwent a menisectomy. No major or minor complications were reported, and all patients returned to their previous activity level at an average of 6 months post-operatively. **Conclusion:** Direct repair of the Segond fracture demonstrates good clinical outcomes, restoration of rotational stability, and maintenance of knee range of motion at two years post-operatively with no major complications.

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46515

THE INTERNALBRACE; A NEW PRIMARY ANTERIOR CRUCIATE LIGAMENT REPAIR TECHNIQUE WITH 2-YEAR FOLLOW-UP

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Introduction: This study describes a new anterior cruciate ligament (ACL) repair technique using the InternalBrace™ with 2-year follow-up results. **Methods:** 42 patients with an acute ACL rupture undergoing repair using the InternalBrace™ technique were prospectively followed up for 2 years. Patients with mid-substance or distal ruptures, retracted ACL remnants, or with multi-ligament injuries were excluded. KOOS, WOMAC, VAS pain, VR-12 and Marx Activity scale were collected. Patients with a re-rupture were identified. **Results:** The mean KOOS at 2 years were 87.9, 84.5, 93.3, 76.6 and 70.8 for pain, symptoms, ADL, sport/recreation and QOL respectively. The mean WOMAC scores at 2 years were 91.6, 88.2 and 93.3 for pain, stiffness and function respectively. The VAS pain score improved from 2.7 preoperatively to 1.3 at 2 years and the VR-12 physical score improved from 35.9 preoperatively to 50.3 at 2 years. All the previous scores improved significantly compared to preoperatively ($p < 0.001$). The Marx activity scale decreased from 12.8 preoperatively to 8.3 at 2 years. 2 patients suffered from a re-rupture (4.8%, CI -1.7-11.2%). **Conclusions:** This study demonstrates encouraging two year follow-up results of the InternalBrace™ technique for acute ACL repair. The KOOS, WOMAC, VAS pain and VR-12 physical scores improved significantly compared to preoperative. The highest KOOS improvement is seen in sports and recreation. The ACL re-rupture rate was 4.8% which is comparable to other successful techniques. **Implications:** ACL repair with the InternalBrace™ technique is an attractive alternative to ACL reconstruction, avoiding the morbidity associated with large bone tunnels and graft sites, whilst preserving the native ACL and its proprioceptive properties.

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46995

CERAMIC BONE GRAFT SUBSTITUTES DO NOT REDUCE DONOR SITE MORBIDITY IN ACL RECONSTRUCTION SURGERY

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Background: Anterior-knee pain is a major problem following Bone-patellar-tendon-bone graft (BPTB) use in anterior cruciate ligament (ACL) reconstruction. We hypothesized that filling the donor site defect with bone-graft substitute would reduce the anterior knee symptoms in ACL reconstruction surgery. Methods: Patients operated for ACL deficient knee between March 2008 and August 2009 using BPTB graft were divided into two treatment groups. The patellar and tibial donor site bony defects were filled-up with Hydroxyapatite-Bioglass (HAP: BG) blocks in study group (n=15) and no filler was used in control group (n=16). At 2 years, the clinical improvement was assessed using International Knee Documentation Committee score and donor site morbidity was assessed by questionnaires and specific tests related to anterior knee pain symptoms. Results: Donor site tenderness was present in 40% patients in study group and 37.5% patients in control group (p=0.59). Pain upon kneeling was present in 33.3% patients in study group and 37.5% patients in control group (p=0.55). Walking in kneeling position elicited pain in 40% patients in study group and 43.8% in control group (p=0.56). The mean VAS for knee pain was 3.0 in study group and 3.13 in control group, with no statistically significant difference (p=0.68). Unlike control group, where a persistent bony depression defect was observed at donor sites, no such defects were observed in the study group. Conclusion: Filling the donor site defects with HAP: BG blocks do not reduce the anterior knee symptoms in patients with ACL reconstruction using autogenous BPTB graft.

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46823

IN-VIVO COMPARISON OF ENDOBUTTON WITH TIGHTROPE FOR FEMORAL FIXATION OF THE GRAFT IN ACL RECONSTRUCTION IN TERMS OF FUNCTIONAL OUTCOME SCORE AND ANTERIOR TIBIAL TRANSLATION -A RETROSPECTIVE REVIEW

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Purpose: There is lack of in vivo study comparing the functional outcome and knee stability after anterior cruciate ligament reconstruction (ACLR) using EndoButton and TightRope ,as a femoral fixation devices. **Materials and methods:** Two matched groups of patients one of EndoButton group consisting of 53 patients were compared with another TightRope group consisting 50 patients. Functional outcomes were assessed in term of the International Knee Documentation Committee (IKDC) and Lysholm score, knee stability by antero-posterior laxity and side to side difference using KT-1000. The evaluation was performed preoperatively and postoperatively at sixth and 24th month. **Results:** Both group were matched in term demographic, preoperative, intraoperative and postoperative covariates. There were significant improvement in the IKDC, Lysholm score, anterior tibial translation and side to side difference at six and 24 months after ACLR in each group. EndoButton appeared to have better IKDC (79.5 vs 74.9; $p<0.05$) and Lysholm (88.5 vs 83.4; $p<0.05$) score at sixth month postoperative than TightRope. At the end of 24 months of follow up difference in IKDC (85.2 vs 84.3; $p>0.05$) and Lysholm (91.9 vs 91.8; $p>0.05$) score became statistically insignificant. The anterior tibial translation and side-to-side difference were statistically insignificant between the group at all point of evaluation. Both groups were also comparable in term of complications. **Conclusion:** ACLR using EndoButton or TightRope for femoral fixation gives substantially equivalent functional results and knee stability at midterm follow up

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 48259

GRAFT MATURATION FOLLOWING ANATOMIC ACL RECONSTRUCTION USING HAMSTRING AUTOGRAFT: DOES POST OPERATIVE ROM RESTRICTION MAKE A DIFFERENCE?

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Background : The purpose of this study was to compare the clinical outcomes of aggressive rehabilitation and conservative rehabilitation after anatomic anterior cruciate ligament(ACL) reconstruction by assessing clinical scores, stability of the knee joint and tunnel widening & graft signal intensity on follow-up MRI. We hypothesized that conservative rehabilitation would lead to better clinical results and graft maturation on MRI than aggressive rehabilitation group. **Methods:** 95 patients enrolled arthroscopic single-bundle ACL reconstruction with four strand autologous hamstring graft. Group A consisted of 68 patients with aggressive rehabilitation. Group B consisted of 27 patients with conservative rehabilitation(ROM restriction in early phase). We evaluated the clinical results at 1 and 2 year. Also we evaluated and MRI at 1 year. **Results:** At 1 and 2 year follow-up, there was no significant difference in clinical scores, and ROM. And there was no significant difference in stability of knee joint between group A and group B. There was significant tunnel widening after operation on tibia and femur at both groups. Meanwhile, there was no significant difference between two groups in tunnel widening on both tibia and femur. However, conservative rehabilitation group showed lower graft signal intensity at mid substance and femoral side on follow-up MRI than aggressive rehabilitation group. **Conclusions:** There was no significant difference in clinical scores, stability of knee joint and tunnel widening between two groups. However conservative rehabilitation group led to better graft maturation on follow-up MRI in anatomic single bundle ACL reconstruction than aggressive rehabilitation group.

Date: 2017-12-01

Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 47902

**SURGICAL TREATMENT STRATEGY FOR KNEE JOINT DISLOCATION
IN ACUTE AND DELAYED PERIOD**

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Introduction. Knee dislocations are very rare, but manifest a variety of injuries to ligaments, blood vessels, nerves. Conservative therapy leads to poor functional outcomes. Currently there are contradictions regarding the best surgical method, timing and surgical staging. Purpose. To evaluate clinical and functional outcomes of acute and delayed surgery with one- and two-stage approach. Materials and methods. The study included 27 patients with III and IV Schenck type injury, who underwent surgery in 2010-2014. There were 11 (41%) cases of type III with medial ligament, 12 (44%) of type III with lateral ligament and 4 (15%) - type IV dislocations. 17 (63%) patients had acute and 10 (37 %) delayed surgery. In acute period we performed lateral and posterior ligament repair and reconstruction of anterior, while delayed surgery included only ligaments reconstruction. In 15 cases it was one-stage treatment, in 12 - two-staged. The average age of patients at surgery was 34 years, the average follow-up 2,87 (2-6) years. Results. Functional outcome were evaluated by means of ROM and Lysholm scale. There were not statistically significant difference in ROM according to Lysholm scale in Group I patients - 120° (95-130) and 84 (76-92), and 125° (110-135) and 82 (72-90) for Group II. Two-stage treatment showed better results, than one-stage - 120° (105-135) and 86 (78-92), 110° (90-125) and 78 (74-86). After surgery one Group I patient had arthrofibrosis, that required arthroscopic release. Conclusions. Timing of surgery after trauma statistically doesn't influence the outcome. Surgery staging, regardless of timing, reduces arthrofibrosis development and offers good functional outcome.

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Session: Sports Medicine Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 48021

TECHNIQUES OF MAKING PORTALS IN ARTHROSCOPIC ACL RECONSTRUCTION – TRANSTIBIAL OR ANTEROMEDIAL PORTALS: - COMPARISON AND REVIEW OF CLINICAL AND RADIOLOGICAL OUTCOMES

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Introduction: Two arthroscopic techniques are used for creating femoral tunnels, anteromedial (AMP) and transtibial drilling (TT). Transtibial ACL reconstruction places graft in non-anatomical femoral insertion site and this placement is one of the commonest causes of failure. We aim to compare two techniques clinically and radiologically with use of magnetic resonance imaging (MRI). **Methods:** Total 40 cases underwent arthroscopic ACL reconstruction and divided into 2 groups after randomisation and double blinding. Additional knee ligament injuries, previous knee ligament surgery, malalignment, injured contralateral knee were excluded. Preoperatively thorough history, clinical examination and scoring (Lysholm score and IKDC scale) were done. Preoperative and postoperative MRI was done in all for comparison. Sagittal and coronal ACL angles were calculated to look for the graft placement. **Results:** AMP technique showed improved antero-posterior and rotational knee stability. Overall IKDC and Lysholm scores were better than TT technique but difference in functional scores and results were not statistically significant. **Discussion:** TT technique is less demanding, requires shorter operative time, and with fewer chances of posterior femur wall blow out but reconstructed ACL has non-anatomical insertion with vertical orientation. AMP technique provides more freedom to place graft in anatomical position gives improved rotational stability and graft placement resembles course of native ACL. Several authors have compared TT vs AMP technique but it remains unclear which provides better results. Probably a longer follow-up and larger study group shall be required for establishing superiority of one over other

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Session: Research Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 48817

EFFICIENCY OF ORTHOPAEDIC SURGICAL INSTRUMENT TRAYS

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Background: As the cost of healthcare rises in the United States, Orthopaedic surgeons will be held increasingly accountable for operating room efficiency. By streamlining surgical instrument trays, Orthopaedic surgeons can help maintain high quality of care at lower costs. This study aimed to quantify the percent use of instruments among commonly used Orthopaedic trays. We further aimed to calculate time lost when instruments were found to be missing or damaged. Methods: This was a single-site, observational study conducted at a large academic medical center. Data on instrument use and time lost were collected by direct observation by an Orthopaedic resident. Results: The two most commonly used Orthopaedic surgical instrument trays were selected. Thirty-seven procedures using at least one of the two trays were observed. The soft tissue tray used in most upper extremity cases had an average use of 20.4% of instruments with a standard deviation of 6.7%. The basic extremity tray used in most cases involving bony work had an average use of 12.4% of instruments with a standard deviation of 4.6%. Instruments never requested or used by the surgeon in any case comprised 14.9% of the soft tissue tray and 28.6% of the basic extremity tray. There was only one incidence of an instrument requested that was not part of the tray being used. Conclusion: Our study demonstrates a low percent use of instruments in commonly used Orthopaedic surgical instrument trays. By streamlining trays, Orthopaedic surgeons may significantly increase operating room efficiency.

Date: 2017-12-01

Session: Research Short Free Papers

Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47905

**ACCURACY OF THE QUALITATIVE ALPHA-DEFENSIN TEST FOR
DIAGNOSIS OF PERIPROSTHETIC JOINT INFECTION**

Akos ZAHAR, Thorsten GEHRKE, Christian LAUSMANN, Tommaso
BONANZINGA, Lars FROMMELT, Mustafa CITAK
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We conducted a single-center prospective clinical study to analyze the accuracy of the Synovasure™ Alpha-defensin rapid test. A total of 223 consecutive patients with painful total hip (THA) or knee (TKA) arthroplasty were enrolled in this study. In all patients, serum CRP was measured and joint aspirations were performed. From the synovial fluid a leukocyte cell count with granulocyte percentage, microbiology cultures and leukocyte esterase tests were carried out. Furthermore, the Synovasure Lateral Flow Test was performed from the aspirate. 191 subjects with 195 joint aspirations (96 hips, 99 knees) were included in final analysis. We had 119 joints with an aseptic revision and 76 joints with PJI. The overall sensitivity of the Synovasure™ Lateral Flow Test was 92.1% (95% CI, 83.6% to 97.1%), the specificity was 100% (95% CI, 97.0% to 100%), the positive predictive value was 100% (95% CI, 94.9% to 100%), and the negative predictive value was 95.2% (95% CI, 89.9% to 98.2%). The overall accuracy of the Synovasure™ test was 96.9% (189 of 195, 95% CI, 93.4% to 98.9%). The Synovasure™ PJI test has a very high accuracy in diagnosing infected THA and TKA.

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Time: 14:00 - 15:30

Room: 10. Room 1.64

Abstract no.: 47459

CAN WE INCLUDE PATIENT-REPORTED OUTCOME DATA FROM BOTH HIPS IN ANALYSIS OF PATIENTS WITH BILATERAL TOTAL HIP REPLACEMENT?

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Introduction: Bilateral total hip replacement (THR) is common. In Sweden, 28% of patients operated with primary THR due to osteoarthritis have had their contralateral hip replaced within 10 years. Data on bilateral operations may pose analytic difficulties due to the risk of violating the assumption of independent observations. In this study, we explored differences in patient-reported outcomes measures (PROMs) in four THR groups: 1) Unilateral, 2) First two-stage bilateral, 3) Second two-stage bilateral, and 4) One-stage bilateral operation. We also investigated different ways to handle dependency in statistical analyses. **Methods:** We obtained PROMs from the Swedish Hip Arthroplasty Register from 2008 to 2012 on patients with THR due to OA merged with the National Patient Register. We analyzed differences in age, sex, comorbidity, and PROMs with proportionality statistics or density graphs. We compared the results of different regression models estimating postoperative PROMs. **Results:** Age, sex, comorbidities and PROMs were nearly identical for unilateral patients and those with second two-staged operations. One-stage bilateral patients were younger, had less comorbidities, were more often males and had worse preoperative PROMs. The models accounting for dependency (Generalized Estimating Equation, Within Cluster Resampling) did not yield different results compared to logistic regression using all observations, only unilateral, first, or last THR. **Conclusion:** Comorbidity and PROMs data from the second THR in patients with bilateral procedures resembled those of patients with unilateral THRs. These analyses suggest the violation of independent observation using PROMs data from bilateral does not have any practical influence on results.

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SYNOVIAL FLUID TESTING FOR THE DIAGNOSIS OF PROSTHETIC JOINT INFECTION – IMPROVING DIAGNOSTIC ACCURACY WITH SIMPLE AND INEXPENSIVE BIOMARKERS

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Introduction: Periprosthetic joint infection (PJI) is one of the most challenging and frequent complications after joint arthroplasty and yet there is no single test available that can accurately diagnose infection on its own. Preoperative diagnosis, relies mostly on clinical and laboratory data. Our goal is to increase diagnostic accuracy of synovial fluid testing in differentiating PJI by more exhaustively studying simple and inexpensive biomarkers. **Methods:** Between January/2013 and December/2015 total hip or knee arthroplasty revision cases were prospectively included, synovial fluid for biomarker analysis and at least four tissue samples and the implant were gathered for microbiological study. Definitive diagnosis was classified as infection or aseptic based on the International Consensus Meeting definition of PJI. We determined cutoff values, sensitivity and specificity for each marker. **Results:** Fifty-five out of 143 revision arthroplasties fully respected inclusion criteria. Two supposedly aseptic cases were ultimately classified as infected resulting in 32 aseptic and 23 infected cases. Total leukocyte count, proportion of PMN, C-reactive protein, ADA and alpha-2-macroglobulin but not procalcitonin were significantly different between both groups. Cutoff values for optimal performance in the diagnosis of infection were: total leukocyte count >1,463 cells/μL; proportion of PMN >81%; CRP >6.7mg/L and ADA >61U/L. Diagnostic accuracy parameters for each marker as well as different combinations of results were determined. **Conclusion:** Synovial fluid leukocyte count offers great negative predictive value and interpreting it together with other more specific markers is helpful in improving its positive predictive value. These simple and inexpensive markers may reduce the number of equivocal synovial fluid results requiring more expensive investigation.

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Abstract no.: 46455

**COMPUTATIONAL MODELLING OF FORCES ACTING ON THE FEMUR
IN ACETABULAR FRACTURES: A FINITE ELEMENT ANALYSIS STUDY**

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Acetabular fractures in the elderly is presenting an increasing surgical challenge to surgeons treating such injuries due to patient co-morbidities, complex fracture pattern and osteoporotic bone. Conservative treatment of these acetabular fractures can lead to the acetabulum articulating on the femoral neck. As the national centre for acetabular and pelvic trauma, this is a situation that has presented to us with ipsilateral femoral neck fractures after mobilization of the initially conservatively managed patient. This study uses finite element analysis (FEA) modelling to determine if there is a threshold of femoral head medialization that can predict probability of femoral neck fracture. A femoral neck FEA model was created from the CT and MRI scans of a healthy hip. Using FEA software (ABACUS) the model was used to apply point loading to the femoral head at the anatomical weight bearing area and subsequent lateralization of this point down to the femoral neck. This simulates the changing forces acting on the femur as it medialises into a fractured acetabulum. As the point of contact moved laterally the stress levels within the proximal femur increased steadily, particularly along the superior neck. Bending moment at the medial neck shaft junction also increased. This increase in stress levels can be seen as a corollary for risk of fracture within the femur. Patients with such injuries are at an increased risk of femoral neck fractures and we can use this model to help predict risk of fracture to help aid decision-making in high risk surgical patients.

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Abstract no.: 47050

EFFECT OF BONE MORPHOGENETIC PROTEIN-2 ON ATYPICAL FEMORAL FRACTURE DEFECT RODENT MODEL BY BISPHOSPHONATE

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Long term bisphosphonate use can delay the remodeling of calcified cartilage callus to mature bone due to osteoclastic effect, thus delaying fracture healing. Bone morphogenetic proteins (BMPs) are powerful osteoinductive proteins. We hypothesize that BMPs have similar effect as autograft in patients with decreased bone healing potential due to long term bisphosphonate treatment. The purpose of this study was to compare BMPs with allograft and autograft in a rat femoral defect model with long term bisphosphonate treatment. Forty rats were divided into the following four groups depending on implant materials into femoral defect after 9 weeks bisphosphonate (zoledronic acid) injection: Group I: No bone graft (control); Group II: Allogeneous bone graft; Group III: Autogeneious bone graft; and Group IV: rhBMP-2 implant. Radiographic union, micro-CT analysis, manual palpation, and histologic analysis were evaluated. Radiographic union rate, manual union rate, and micro-CT bone volume in Group II and IV were significantly higher than those in group I and II. Group III and IV showed similar results to each other. In conclusion, BMP might have similar effect as autobone in rats with long term bisphosphonate treatment.

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Abstract no.: 46776

A DOUBLE BLINDED RANDOMISED COMPARATIVE STUDY OF 2 PINS VERSUS 3 PINS FOR THE FIXATION OF DORSALLY DISPLACED EXTRA-ARTICULAR DISTAL RADIUS FRACTURES IN THE ELDERLY

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Introduction: Despite pinning being the standard of treatment for dorsally displaced extra-articular distal radius fractures, there is paucity of data regarding the number of pins to be used especially in elderly patients who mostly have osteoporosis. The purpose of this study was to study the radiological and functional outcome of these fractures comparing the results when treated with 2 pins versus 3 pins. **Materials&methods:** A total of 145 patients above 60 years with dorsally displaced extra-articular distal radius fractures were included in this study between January 2015 to December 2015. They were randomized to have their fixations with either 2 K wires (71 patients) or 3 K wires(74 patients). The average follow up was 12 months and the functional outcome was assessed using the DASH score and the radiological outcome was assessed by the radial height, the radial inclination and the volar tilt at follow up. Statistical analysis was done using T-test. **Results :** There was a significant difference(p-value >0.01) in the radial height, radial inclination and the volar tilt in both the groups with the 3 pins group showing better anatomical restoration and better values compared to the 2 pins group. However, there was no significant difference functionally in the DASH scores and the wrist range of movements between both groups at the end of 1 year. **Conclusion :** Even though functional outcomes remain similar at the end of 1 year, 3 pins provide a better outcome radiologically compared to 2 pins in the fixation of dorsally displaced extra-articular distal radius fractures in elderly patients.

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Abstract no.: 48300

L-ARGININE IN TREATMENT OF OSTEOPOROSIS

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Introduction: Nitric oxide (NO) is a short-lived free radical involved in several biological processes as a bioregulator and as a second messenger. It inhibits osteoclastic bone resorption in vitro and regulates bone remodeling. Zoledronic acid has been established as a treatment for post menopausal osteoporosis. Method: One hundred patients of osteoporosis having T score of -2.5 or more, were randomized to receive L-arginine) or Zoledronic acid. All patients received 1.0 g of calcium and 400 IU of vitamin D supplementation per day. In addition Group I patients received Larginine (2 gm.) per day while Group II patients received zoledronic acid 5 mg i.v. over 15 min. Patient were followed at regular intervals clinically, by biochemical investigations and at one year for DEXA scan. Results: Patients in both groups improved clinically and bio-chemically over one year period. T score on DEXA scan at one year showed improvement in bone density. Average pretreatment T score was -3.65 in group I and -3.52 in group II. At one year followup average T score was -2.9 in group I and -2.6 in group II. Difference was not statistically significant. Discussion: Oral administration of L-arginine in pharmacological doses induces growth hormone and insulin like growth factor-1 responses and stimulates nitric oxide synthesis. Growth hormone and insulin like growth factor-1 are important mediator of bone turnover and osteoblastic bone formation. While nitric oxide is potent inhibitor of osteoclastic bone resorption because of this dual effect on physiological regulator of bone remodeling

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Abstract no.: 46613

BLOCKADE OF OSTEOCLAST-MEDIATED BONE RESORPTION WITH A RANKL INHIBITOR ENHANCES SPINAL FUSION

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Osteoprotegerin (OPG) is a RANKL inhibitor that blocks osteoclast differentiation and activation. OPG does not incorporate into bone matrix and has a quick and reversible effect. This study aimed to determine whether administration of OPG after spinal fusion in a rat model will increase bone formation, and whether a timing-dependent dosing regimen would allow for a more targeted control. Sprague-Dawley (SD) rats received a one-level posterolateral intertransverse fusion of L4-L5 with bone allograft. Rats received weekly subcutaneous injections of rat OPG-Fc (10 mg/kg) and were divided into 4 groups according to initiation of administration: saline at day 0, or OPG initiated at day 0, day 10, or day 21 post-surgery. Rats were euthanized at 6 weeks post-surgery. Quantitative microCT analysis of the fusion revealed a greater bone volume fraction and a greater mean trabecular thickness in the groups that received OPG injections starting at day 0 and day 10 after surgery when compared to the group receiving saline ($p < 0.05$). Quantitative histological analysis supported microCT results, revealing a smaller percentage of trabecular bone surface lined with osteoclasts in the groups that received OPG injections at post-surgical day 0 and day 10 when compared to the group that received saline ($p < 0.05$). This study indicates success of OPG in inhibiting osteoclast bone resorption and allowing additional bone formation in spinal fusion. It also demonstrates that early administration of OPG after spinal fusion is critical to enhance fusion mass. Thus, OPG is an attractive therapy to improve spinal fusion and warrants further investigation.

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Abstract no.: 48410

ANALYSIS OF BONY INGROWTH IN NOVEL CERVICAL DISC PROSTHESIS

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A study was carried out to investigate the porous ingrowth and histologic characteristics at the prosthesis-bone interface of cervical disc replacement with a novel cervical disc prosthesis (Pretic-I). Eight mature male goats underwent C3–C4 total disc placement with the novel disc prosthesis through an anterior surgical approach. The specimens were examined using microcomputed tomograph, proceeded by undecalcified histologic technique and routine paraffin processing. Histologic and histomorphometric analyses were used to evaluate the porous osseointegration at the prosthesis-bone interface. There were no cases of prosthesis migration, loosening, subsidence, or neurologic or vascular complications. Gross histologic analysis of the novel disc prosthesis illustrated excellent ingrowth at the prosthesis–bone interface, without significant histopathologic changes. Histomorphometric analysis at the prosthesis-bone interface indicated that the mean porous ingrowth was $42.5\% \pm 8.4\%$. The total range of ingrowth was 32.5% to 54.6%. Histomorphometric analysis of porous ingrowth at the prosthesis-bone interface was more favorable for cervical disc replacement with the novel disc prosthesis than the historical reports of peripheral total joint arthroplasty. These findings in the present study provide a foundation for ongoing clinical investigations.

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Abstract no.: 46332

MESENCHYMAL STEM CELLS (MSCS) DELIVERED IN A NOVEL HYDROGEL FOR THE TREATMENT OF CHONDRAL DEFECTS IN A RABBIT ANIMAL MODEL

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The purpose of the study was to determine whether bone marrow-derived MSCs (BMDMSCs) embedded in chondroitin sulfate (ChS)/poly (ethylene glycol) (PEG) display enhanced chondrogenesis when compared to the hydrogel alone, for the treatment of an osteochondral defect in a rabbit animal model. Rabbit allogenic BMDMSCs were harvested and expanded. Then, a critical sized chondral defect (3mm width x 2mm depth) was performed bilaterally in the trochlea of 10 mature New Zealand white rabbits. Three groups were established: A- hydrogel (5N), B- hydrogel +MSCs (30 x 10⁶ cell/ml) (5N), and C- control defect (10N). All animals tolerated the surgery with no major complications. At 6 months post-operative, all hydrogels remained in place and there was no gross synovial reaction or macroscopic inflammation. Cartilage repair tissue was evident in all groups. Macroscopically, there was no difference between groups ($p= 0.035$). Histologically all groups showed chondrogenesis. However, hydrogel alone had the best total score (A: 17.4 ± 4.72 , B: 13 ± 3 , and C: 16.7 ± 2.91) ($p>.05$). Compared to the hydrogel and MSCs, hydrogel alone showed better chondrogenesis, more regular surface and less cluster formation, but there was a "gap" or weak integration between the repaired tissue and the subchondral bone. Adding MSCs to the hydrogel did not improve cartilage healing and induced unwanted calcification.

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Abstract no.: 46962

ENHANCED CARTILAGE REGENERATION AFTER TYPE II COLLAGEN GEL-ASSISTED AUTOLOGOUS BONE MARROW CELL CONCENTRATE TRANSPLANTATION IN CHONDRAL DEFECT IN MINIPIGS

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Articular cartilage repair remains a challenge in orthopedic surgery, as none of the current clinical therapies can regenerate the functional hyaline cartilage tissue. In this study, we proposed a one-step surgery strategy that uses autologous bone marrow cell concentrate (BMCC) embedded in type II collagen (Col-II) gels to repair the full thickness chondral defects in minipig models. Briefly, 8 mm full thickness chondral defects were created in both knees separately, one knee received Col-II + BMCC transplantation, while the untreated knee served as control. At 1, 3 and 6 months postoperatively, the animals were sacrificed, regenerated tissue was evaluated by magnetic resonance imaging, macro- and microscopic observation, and histological analysis. Results showed that regenerated tissue in Col-II + BMCC transplantation group exhibited significantly better structure compared with that in control group, in terms of cell distribution, smoothness of surface, adjacent tissue integration, Col-II content, structure of calcified layer and subchondral bone. With the regeneration of hyaline-like cartilage tissue, this one-step strategy has the potential to be translated into clinical application.

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Abstract no.: 46751

A LA CARTE APPROACH IN SURGICAL TREATMENT OF EQUINUS DEFORMITY IN PATIENTS WITH RECURRENT CLUBFOOT

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Background: Pediatric clubfoot patients with relapses after surgical treatment are prone to developing residual deformities including resistant equinus. Given the complex etiology of equinus, we propose specific operative approaches to address common causes. Methods: The study population comprised pediatric patients with significant residual equinus ($110-150^\circ$) and restricted ankle range of motion ($15-20^\circ$) following surgical treatment of recurrent clubfoot. Surgical treatment was dictated by the specific deformity and patient age. The potential degree of correction was determined using talar block sphericity. To avoid posterior release - we combined achillotomy in conjunction with closed bringing down of calcaneus during casting. We used that approach for a group of patients under 3 years old. In older patients with residual deformity we used Ilizarov frame to correct equines. In cases with lack of sphericity or deformity in distal epiphysis of tibia we preferred stapling of growth plates in group of patients about 8-14 years old. In older patients we used supramalleolar osteotomy of tibia bone. Midfoot deformity was addressed with closing wedge osteotomy of the cuboid. In cases of mixed deformity, surgical approaches were combined. Results: 64 patients (2-15 years old), 39 (61%) males and 25 (39%) females, were included in this study. 33 patients (51.5%) presented with bilateral deformity. After five-year follow-up, 60 patients (75 operations) demonstrated good results, while four patients (five operations) experienced recurrence and/or need for additional operations. Discussion: These less traumatic techniques may allow correction of deformity, reduction in relapse rate while minimizing severe complications.

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Abstract no.: 47382

INTRAARTICULAR STRUCTURES LIKE LIGAMENT IN ADOLESCENTS' KNEE WHICH CAUSED RECURRENT LUXATION OF THE PATELLA

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The purpose of this study is to show three, not yet described in literature, unusual intraarticular structure like a ligament which was discovered in adolescents during therapeutic arthroscopy because of recurrent luxation of the patella. Unusual intraarticular structures, were found in three children aged 12-14, looking like a ligament, starting from medial suprapatellar joint capsule and ending in the level of the joint cavity or below in lateral part of the capsule. During knee flexion the structures stretched the patella laterally and caused the obvious luxation of the patella. After removal of this unusual structure arthroscopically, the samples were treated by antibodies against collagen type I and collagen type III. Longitudinal histological slices were stained by hematoxylin-eosin, and on each slice central and peripheral zones were recognized. The central zone consisted of collagen fibers which were linearly arranged, with few fibroblasts between them. Peripheral zone of the tissue sample is synovial sheet with a continuous layer of stratified lining epithelial cells on the surface. The blood vessels were very rare. From histological findings we have presumed that it was the remnants of the plica, which was completely separated from the base of the capsule. Plica is usually relatively common occurrence and could be associated with inflammation and some other pathological conditions in orthopedics. Until now the undescribed forms of the remnants of the plica look like a ligament as a special entity inside the knee. During adolescence lateral synovial plica may cause lateral luxation of the patella, especially in athletes.

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Abstract no.: 46530

ILIZAROV APPARATUS FOR MANAGING SEVERE TYPES OF PERTHES'S DISEASE

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Introduction: A great number of authors doubt in the expediency of external fixation for treating Perthes's disease. Purpose: We present the results of applying apparatus techniques for managing severe types of Perthes's disease. Materials and methods: We analyzed the results of treatment of 39 patients aged 5 to 10 years with Perthes's disease in the fragmentation stage. Distribution of joints according to Catterall, group III – 23, group IV - 16; according to Herring, group B/C 24 cases, group C - 15. In all cases the applied hip decompression by external fixator, perforation of joint components with wires and injections of cell-tissue suspension into femoral head. The method was applied in an isolated form in 16 cases. In 10 observations made additionally varus osteotomy, in 13 cases - the innominate osteotomy. Indications to perform additional interventions have established based on the age, the magnitude of NSA, extent of the violation of the articular relationships. Results: Complete restoration of the epiphysis structure was seen not earlier than 1.5 years after apparatus removal in most cases. Distribution of joints according to Stulberg: class I - 10, class II - 19, class III – 7, class IV - 2. Conclusions: Middle - term follow-ups showed that the adequate joint unloading, local blood supply stimulation, differentiated use of reconstructive procedures provided the conditions for restoration of the epiphysis structure and shape.

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Abstract no.: 46852

A STUDY OF THE USE OF TRANEXAMIC ACID IN SPINAL FUSION FOR SPINAL MUSCULAR ATROPHY SCOLIOSIS

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Introduction: Multilevel spinal fusion surgery in neuromuscular scoliosis has typically been associated with significant blood loss and transfusion requirements. This study was aimed to decide the effect of tranexamic acid (TXA) on spinal muscular atrophy (SMA) scoliosis surgery under the same fusion procedure, number of vertebrae fused, anesthetic team and postoperative care team. Methods: From 1993 to 2015 April, we collected the data of patients who were indicated to receive corrective spine surgery due to SMA scoliosis. The patients were divided to two groups (1) TXA group (2) Non-TXA group based on the use of TXA intra-operatively or not. TXA was administered at 100 mg/kg hr for a loading dose followed by 10 mg/kg hr for a maintenance dose. Result: There were 30 patients enrolled into this study, and there was 15 patients in each group. Comparing with these two groups, there were no significant difference on preoperative and operative variables (age, pre-op and post-op Cobb's angle, correction rate, operation time, and patient coagulation profile). However, the TXA group had significant less physical peri-operative estimated blood loss (blood loss/ blood volume (%)) and less transfusion crystalloid volume, and ICU intubation time. In addition, the TXA group had less post-operative pulmonary complication (pneumonia, and pulmonary congestion). Conclusion: TXA use in SMA scoliosis surgery could result in less peri-operative blood loss and less transfusion crystalloid mount. These benefit could be correlated with less post-operative intubation duration and pulmonary complication rate.

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Abstract no.: 46205

GROWTH MODULATION AND REMODELING BY MEANS OF POSTERIOR TETHERING TECHNIQUE FOR CORRECTION OF EARLY-ONSET SCOLIOSIS WITH THORACOLUMBAR KYPHOSIS

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Purpose to evaluate the role of the non-fusion instrumented procedure with compression adjunct to lengthening by distraction in facilitating spinal modulation of the wedged peak vertebra, in patients with congenital thoracolumbar kyphosis according to the Hueter–Volkman law. Methods Ongoing data collection of 14 peak wedged vertebra modulation during surgical management of 13 patients with Type I congenital thoracolumbar kyphosis (5 patients) or kyphoscoliosis (8 patients). Age at initial surgery averaged 58.6 months, with mean follow-up of 55.6 months (24–78). All were done with hybrid rib construct with clawing fashion through a single posterior approach with at least 4 lengthenings. Results Two vertebral bodies were selected, the peaked deformed vertebrae within the instrumentation compression level (WICL) and the vertebrae nearest but outside the instrumentation compression process (OICL). Anterior vertebral body height (AVBH) and posterior vertebral body height (PVBH) were measured in both vertebral bodies. Regarding measured vertebrae (WICL), average preoperative AVBH/PVBH ratio significantly increased from 0.54 to 0.77 in the final follow-up. Regarding measured vertebrae (OICL), the average preoperative AVBH/PVBH ratio increased from 0.76 to 0.79 in the final follow-up. Modulation can be confirmed in the most deformed vertebrae (WICL) as the difference between the change in AVBH/PVBH ratio between vertebrae (OICL) and (WICL) was statistically significant ($P<0.001$). Conclusions Through the compression model adjunct to lengthening through distraction implemented in the surgical management of early-onset scoliosis, wedging improves through vertebral modulation (WICL) in comparison with the (OICL).

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Abstract no.: 47026

**COMPLICATIONS FOLLOWING ACUTE HAEMATOGENOUS
OSTEOMYELITIS IN CHILDREN**

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Introduction: Paediatric acute haematogenous osteomyelitis (AHO) is frequently complicated by the development of sequestrum, pathological fracture, chronic osteomyelitis and growth arrest. This study determines the frequency of complications, their management and outcomes of these patients. We determined the predictive value of clinical, biochemical and radiological variables on the development of complications following AHO. Methods: Clinical records were reviewed for 81 patients who underwent incision and drainage for AHO of the long bones from 2005 to 2016. Clinical course, the occurrence of complications and the eventual outcome were documented. Complications were defined as; development of sequestrum, chronic osteitis, pathological fracture and/or growth arrest. Results were analysed to determine factors predisposing to complications and the difference in outcome between patients that developed complications and those that didn't. Results: The mean age at presentation was 7.5 years, the mean follow-up was 1.8 years. Thirty-nine patients (48%) developed 67 complications. Twenty-six patients developed sequestrum, 19 pathological fractures, 13 chronic osteomyelitis and 9 growth arrest. Of all variables analysed, only the extent of radiological change at 6 weeks was predictive of the development of complications ($p < 0.001$). Patients that developed complications spent on average 21 weeks in hospital, compared to 6 weeks in those that did not ($p < 0.001$). Thirteen patients that developed complications had a poor outcome, compared to 0 patients that did not ($p < 0.001$). Conclusion: AHO may result in chronic disability, despite early recognition and adequate initial treatment. Early recognition of extensive bony involvement warrants immobilisation to prevent fracture and increased vigilance to identify and manage complications timeously.

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Abstract no.: 48423

THE RESULTS OF SURGICAL TREATMENT FOR LONGITUDINAL EPIPHYSEAL BRACKET WITH POLYSYNDACTYLY

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Purpose: The purpose of this study was to evaluate the results of surgical treatment for longitudinal epiphyseal bracket in phalanx or metatarsal with polysyndactyly. **Methods:** From 2006 to 2014, we treated 14 feet and 1 hands in 14 patients who have underlying polysyndactyly. The average age at the time of operation was 3.35 years. The average follow-up period was 52 months. patients were divided into 3 groups according to their treatments. to evaluate outcomes of surgical treatment in bracket epiphysis, three measurements have been used such as the lateral axis deviation (LAD) and intraosseous angulation (IOA), meta-diaphyseal length index (MDLI). The range of motion in fingers and toes was also evaluated at the last follow up. **Results:** The radiological result were satisfactory. The mean preoperative LAD was 25.3°. At the last follow-up, the mean corrected LAD was 11.2°. The mean preoperative IOA was 38.1°. At the last follow-up, the mean corrected IOA was 14.4°. The mean preoperative MDLI was 0.66. At the last follow-up, the mean corrected MDLI was 0.86. 4 patients had a residual angular deformity and shortening of affected bone with complete ossified longitudinal epiphyseal bracket. **Conclusion:** Overall final results of our surgical treatment were satisfactory at the latest follow-up, with improved ROM. for polysyndactyly cases, we emphasize that incomplete longitudinal epiphyseal bracket often recur in children as they grow; in those cases additional epiphysiolysis should be performed.

Date: 2017-12-01

Session: Paediatrics Short Free Papers

Time: 16:00 - 17:30

Room: 10. Room 1.64

Abstract no.: 46970

CLINICAL, LABORATORY AND RADIOLOGICAL PROFILE OF CHILDREN SUFFERING FROM SEPTIC ARTHRITIS IN A TERTIARY HOSPITAL IN DELHI

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BACKGROUND: It is important to identify parameters which diagnose septic arthritis early and don't mandate positive cultures. Changing trends in clinical presentation, microbiological spectrum and emerging drug resistance need to be studied repeatedly. **METHODS:** An observational study was carried out on 59 children with signs and symptoms of septic arthritis . Radiographs and ultrasound of affected joints were obtained. Serial monitoring of ESR, CRP, blood WBC count was done. Joint fluid was sent for WBC count, culture and gram staining. Association was found between Septic arthritis and clinical, laboratory and radiological parameters. **RESULTS:** False negative ultrasound was seen in 8.5 % cases. 67.8% subjects had joint fluid WBC < 50000 /mm³. Culture was positive in 44.1 % subjects. CRP declined rapidly following arthrotomy and i.v. antibiotics whereas ESR had a slower decline. Antibiotics like Cloxacillin, Ceftriaxone which are part of the WHO guidelines for septic arthritis (2001) were sensitive in about one third of the culture positive cases or less. No resistance was found against Vancomycin and Linezolid. **CONCLUSIONS:** The study confirmed the need to re-evaluate criteria of joint fluid WBC > 50000 cells/mm³ for diagnosing septic arthritis. Ultrasound as a single modality does not have absolute reliability to rule out joint effusion. It is must to aspirate the joint even if ultrasound is normal in patients suspected to have septic arthritis. There is a rise in infections with MRSA and it is required to revise antibiotic guidelines for management of Septic Arthritis due to emergence of drug resistance.

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Time: 16:00 - 17:30

Room: 10. Room 1.64

Abstract no.: 47714

AN EVOLUTIONAL WAY OF BONE AXIS MEASUREMENT TO PEDIATRIC CALCANEUS WITH SCIENTIFIC SOFTWARE : RETROSPECTIVE STUDY OF 43 CASES.

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Introduction : Bone axis measurement is important to orthopaedic surgery. We design a software to calculate bone axis and we expect it to show better reliability. **Methods :** We design 2 methods in our software to measure the axis of bone. We record numerous points at the edge of bone and the program calculate the best fitting vector by linear regression analysis among the envelope forming by recorded points (Ve) and the area inside the envelope (Va). Traditional freehand drawing is also used for comparison(Vf). 43 lateral radiographs of foot were collected randomly among children less than 5 years old in our clinics. The measurements of the axis by the 3 methods was performed by 2 independent observers : An experienced orthopaedic surgeon and a junior orthopaedic resident. After 5 days interval, repeated measurements were performed. Paired t test is used to evaluate inter-and intra-observer reliability among each method. **Results :** Significant differences are noted between the computerized method(Va and Ve) and the traditional freehand method (Vf). (all p < .05). Significant difference of intra-observer measurements in Vf method is also noted. No significant difference is noted between the Va and the Ve methods. **Conclusion :** Our software shows significantly better intra- and inter-observer reliability than conventional method. No statistical difference was noted between measurements of experienced and non-experienced users which is also the best proof for facilitating users with scientific solution to this evolutionary new defined bone axis software. Future application in congenital calcaneal deformities is expected.

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Abstract no.: 46658

THE USE OF PEEK CAGE AS AN ALTERNATIVE FOR AUTOGRAFT IN ANTERIOR CLACANEAL LENGTHENING OSTEOTOMY TO TREAT PAINFUL FLEXIBLE FLAT FOOT IN ADOLESCENTS; SURGICAL TECHNIQUE.

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Abstract: anterior calceal lengthening osteotomy (ACLO) is a common procedure used to treat painful flexible flat foot. One of the difficulties of the technique is the need for bone graft, to overcome this problem a series of cases we used the cervical PEEK cage has been used to replace classic bone graft. Introduction: Painful flexible flat foot treatment by (ACLO) described by Mosca is very popular and successful. Most of the literature reports using allograft in this procedure. Due to lack of bone bank in our community we utilised the PEEK cage used in the cervical spine surgery for fusion to replace the bone graft. Polyetheretherketone (PEEK) as a material is well tested in the spine literature for the fusion rate and incorporation. This study aims to investigate the possibility of PEEK cage use in opening wedge osteotomy as a substitute to iliac bone graft. Material and methods: we would present the early result of PEEK cervical cage in the treatment of painful flexible flat foot who failed conservative treatment. In this series we are presenting 10 cases operated using the cage instead of the bone graft. Average age is 13-14y with average follow up 12 months to 18 months, we used the classic technique used by Mosca. Results: All cases showed full union with full range of motion. The average duration for healing ranged from 8-10 weeks. Discussion: Although PEEK as a material was tested for fusion in the cervical spine it has been never tested in the lower limb.

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Abstract no.: 47813

ILIZAROV FOR LEGG-CLAVE-PERTHES DISEASE

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This study presents the results of prospective consecutive cohort of patient with Legg-Calvé-Perthes disease treated by Ilizarov technique between 1995 and 2014. The primary aim is to determine the maintenance of head coverage and joint congruity and functional outcomes of this Ilizarov technique. Methods: 26 patients with a mean follow up of 12 years (range 4 to 12) were included. Results: Cumulative maintenance of head coverage and joint congruity rate for all was (95%) at 12 years. Conclusion: Articulated hinge distraction in LCPD gives satisfactory and reproducible long term clinical results. Keywords: Legg-Calvé-Perthes; Ilizarov; Radiographic results; Arthrosis; Hip rotation;

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Abstract no.: 47273

POSTTRAUMATIC PSEUDARTHROSIS OF THE CLAVICLE IN PEDIATRIC PATIENTS

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Introduction: Posttraumatic clavicle nonunion is extremely rare, particularly in children. Only four cases of pseudarthrosis after fracture clavicle, in patients aged 10 years and younger, have been reported. Material and Methods: We present a case of a 7 yo patient, who suffered direct blunt to his right upper extremity back in 2012 and was diagnosed as contusion. After a mass appearance on his right clavicle, he was sent to clinics again to re-evaluate. As the patient had no ROM limitation, he was discharged. He came to our clinics, in September 2015, due to shortening and deformity in his right clavicle. We performed x-ray and MRI. Finally, clavicle pseudarthrosis was diagnosed. Surgery was performed in March 2016, using a direct approach to his right clavicle. We identified a focus of hypertrophic pseudarthrosis, so we proceed to treat it. Then autologous iliac crest graft was and a variable locking plate was implanted. Results: He was protected with a sling, and three weeks after he started rehabilitation program. Six months after surgery, x-rays showed progressive ossification callus, with a complete, painless ROM and he came back to his sports activity. Conclusion: Clavicle pseudarthrosis is a very uncommon pathology in pediatric patients. We may misdiagnose it if we do not perform a good diagnosis and treatment them well, complications related to not only with esthetic reasons, but also for structural and/or neurovascular issues could appear.

Date: 2017-12-02

Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48744

CARTILAGE REPAIR TECHNIQUES FOR THE CHONDRAL INJURY IN THE HIP - SYSTEMATIC REVIEW

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Introduction: Currently, no recent systematic review exists in the literature to provide surgeons with evidence-based recommendations on treating osteochondral cartilage injuries in the hip. **Methods:** A systematic review of the literature from PubMed (Medline), EMBASE, Google Scholar, BNI, CINAHL and AMED was undertaken from their inception to March 2017. The PRISMA guidelines were used for designing this study. Clinical outcome studies, prospective/retrospective case series and case reports that described the outcome of cartilage repair technique for the chondral injury in the hip were included. Hip replacement surgery, studies on animal model, basic studies, studies describing trial protocols without any results, studies on other joints, and review articles were excluded. **Results:** The systematic review found 21 relevant papers for the inclusion and this involved 596 hips. Over 80% of the included studies were published in or after 2010. Most studies were case-series or case reports (18 studies, 85.7%). Arthroscopy were used in 11 studies (52.4 %). Minimum follow-up period was 6 months after procedure. Mean age of the participants was 37.2 years. 93.5 % of patients involved had cartilage injuries of acetabulum and 6.5 % of them had injuries of femoral head. Among 10 techniques found in the systematic review, autologous matrix-induced chondrogenesis, osteochondral autograft transplantation, and microfracture were the three well-reported techniques. **Conclusions:** Although there are many different techniques available for cartilage repair in the hip, their outcomes were mostly described in very limited case series. An evidence-based multidisciplinary treatment approach should be utilised until supporting evidence is available.

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Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48542

**HIP ARTHROSCOPY IN FEMORAL ACETABULAR IMPINGEMENT:
IMPROVED FUNCTIONAL OUTCOME AT 5 YEARS FOLLOW UP.**

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Introduction: Femoral Acetabular Impingement (FAI) is a clinical syndrome leading to pain as a result of a biomechanical abnormality in the hip either CAM lesion, pincer deformity or a combination of these. Range of movement is usually limited and function impaired. Limited evidence is available to demonstrate the functional outcome after arthroscopic surgery. The aim of this study was to prospectively evaluate the presentation, treatment and functional outcome after hip arthroscopic surgery for patients presenting with FAI between 2007 and 2010. Methods: 196 patients were included in this study and subjects were assessed pre-operatively and post-operatively at 12 months, 3 years and 5 years. The non-arthritic hip score, the UCLA activity score, the Harris hip score and the VAS pain score were recorded. Ten patients were lost to follow up, leaving 186 patients with a mean follow up of 55.8 months. Results: An improvement was noted in most patients post surgery. Improvements were seen at each follow up; by 3 years mean NAHS score increased by 26.4 points, the UCLA activity score increased by 3.9 points, the HHS improved by 22.3 points and the VAS pain score decreased by 3.2 points. Increased symptoms and less sport participation were seen at 5 years. Discussion: Hip arthroscopic surgery is a safe and effective procedure for properly selected patients suffering from FAI. Conclusion: Hip arthroscopy improves outcomes in patients with FAI. Further research is required. Further research is required on outcome over a longer follow up period.

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Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47141

TREATMENT OF AVN USING THE CHAMBER INDUCTION TECHNIQUE AND BIOTECHNOLOGIES:

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Introduction: The necrosis of the femoral head is a fairly widespread problem especially in young people between 30 and 50 years. Excluding post-traumatic forms, the etiology is not yet fully understood. Several studies in the literature show that core decompression is the method of choice for the treatment of necrosis of the femoral head in the early stages, with good clinical results in the short term. Since some years we are performing core decompression in association with biotechnologies implantation (growth factors, mesenchimal stromal cells and bone substitute). **Objectives:** to determinate the efficacy of core decompression technique with the use of recombinant morphogenetic proteins, autologous mesenchimal stromal cells (MSCs) and xenograft bone substitute into the necrotic lesion of the femoral head on clinical symptoms and on the progression of osteonecrosis of the femoral head. **Methods:** We studied 38 patients and 40 hips with early stages of osteonecrosis of the femoral head. **Results:** Core decompression technique with the use of recombinant morphogenetic proteins, autologous MSCs and xenograft bone substitute afforded a significant reduction in pain and in joint symptoms and reduced the incidence of fractural stages. At 34 months, 33 patient reach the clinical and radiographic healing. **Conclusions:** This long term follow-up study confirmed that core decompression technique with the use of recombinant morphogenetic proteins, autologous MSCs and xenograft bone substitute might be an effective treatment for patients with early stages of osteonecrosis of the femoral head.

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Abstract no.: 46357

A COMPARATIVE STUDY BETWEEN REPAIRING AND NON REPAIRING OF SOFT TISSUE IN TOTAL HIP ARTHROPLASTY BY POSTERIOR APPROACH

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Introduction: Posterior soft tissue repair in Total hip arthroplasty theoretically can reduce posterior dislocation of prosthesis. This study tries to compare dislocation rate between two groups: one with repairing and the other one without repairing soft tissue in posterior approach for total hip arthroplasty. Materials and methods: every primary total hip arthroplasty by posterior approach for Destructive joint disease in age range of 40 to 70 years entered the study. They were done by one team consists of two surgeons. One surgeon did posterior soft tissue repair and the other one did not repair posterior soft tissue. Cup or stem malpositioning, intra operative fracture and post operative infection were exclusion criterias. Post operative care of two groups were the same. Dislocations in follow up periods (1 month, 3 months and 1 years) were recorded. Results: from 2005 to 2010, 138 cases were in repaired group and 204 cases were in non repaired group. there were no difference in demographic parameters of two groups (age, sex, side, weight, height). There were 4 dislocations in first group (2.89%) and 6 dislocations in the other group (2.94%). Discussion: Although dislocation rate in non repaired group was slightly higher, it is not statistically meaningful. It seems component position plays the major role for stability in posterior approach not soft tissue repair

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Abstract no.: 46781

**LATERAL APPROACH VS ANTERIOR APPROACH IN TOTAL HIP JOINT.
GAIT ANALYSIS EVALUATION.**

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The direct anterior approach (DAA) to total hip arthroplasty is a minimally invasive alternative to the lateral approach. The aim of our study is to compare the efficacy of the minimally invasive direct anterior approach and the standard lateral approach (by Bauer) to total hip replacement surgery, by observing intra and perioperative outcomes and gait analysis outcomes performed before surgery and after 6 weeks and 12 weeks. In particular we have analyzed the differences in gait recovery and muscle function. 60 patients have been studied. They we divided into two groups: group a) of 30 patients who had surgery with anterior direct approach and group b) of 30 patients who had the lateral approach. We have considered: length of the surgical procedure, intra-operative complications, intra and post-operative blood loss, post-operative pain, nausea and vomiting, length of stay, gait analysis. The two groups were homogenous when compared in relation to mean age, sex and body weight. In our study patients treated with a minimally invasive direct anterior approach had a better perioperative outcome and a quicker gait recovery and muscle function.

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Abstract no.: 46665

NATIONAL SCREENING FOR DDH IN LIBYA

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In my country the orthopaedic surgeons faced with referred cases of DDH quit regularly. The true incidence was not looked for, we in orthopaedic dept. decided to study the incidence of DDH in the greater Tripoli area, the study was started in two major hospitals between first July 2009 and finished by end of June 2010. Two teams were involved each team with two obstetricians, four SHOs and two orthopaedic surgeons. The SHOs are assigned to fill the assessment sheet. Ortolani and Barlow tests were used for examination for all newly born babies. Those positive cases as well as those with family history, torticollis and breech deliveries are sent for ultrasound exam. We excluded premature, Apgar score of less than 6. Result, out of 12300 newly born babies of which 6642 males and 5658 females, only 142 cases are sent for US exam, of those only 11 cases were confirmed positive true DDH. Nine females and two males. Conclusion, the incidence of DDH in greater Tripoli area is estimated around 8.9 per 10000 newly born babies, selective US examination for risk factors and those with clinical anomalies of the hip is an adjuvant tool for early diagnosis of DDH.

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Abstract no.: 47391

**PERIACETABULAR OSTEOTOMY FOR SEVERE HIP DYSPLASIA IN
CHARCOT-MARIE-TOOTH DISEASE**

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Introduction: Charcot-Marie-Tooth disease (CMTD) is a rare disorder. Approximately 10% of these patients have hip dysplasia characterised by its late but severe appearance, low acetabular volume and subluxation. The periacetabular osteotomy (PAO) seems promising in treating these severely dysplastic hips, but few studies with adequate follow-up are available. Our purpose is to describe the results, outcome and complications of PAO for these patients. Methods: A retrospective analysis of clinical and radiographic data was performed. Standard HD measurements and degree of osteoarthritis by Tönnis criteria were documented. At follow up, the WOMAC self reported function was documented. Results: Twenty-five hips in 16 patients underwent PAO, with average follow-up of 4.9 years (2-11 years). Mean age was 16 (13-23) years. Eight additional proximal femoral osteotomies were performed, three additional arrotomies. Postoperative radiographic measurements drastically improved in terms of acetabular coverage. However, in none of these patients we could achieve a completely normal joint. Patient satisfaction was modest to high, with improvement from HHS (51 preop to 83 postop) and a WOMAC score between 61-94. Complications included three incomplete neurologic injuries of the peroneal and femoral nerve, three delayed or non-unions, three spontaneous inferior rami fractures. The overall complication rate is high as compared to PAO performed in standard HD patients. Progression of osteoarthritis occurred in 9 patients. Conclusion: PAO is capable of improving the radiographic appearance of the hip and functional outcome in patients with CMTD, but the rate of complications as compared to HD treatment is high.

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Time: 08:00 - 10:00

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Abstract no.: 47376

COMPUTED TOMOGRAPHY IN THE ASSESSMENT OF CLOSED REDUCTION IN DEVELOPMENTAL DISLOCATION OF THE HIP

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ABSTRACT Purpose: Was to assess the role of computed tomography (CT) in evaluation of adequacy of closed reduction in cases of developmental dislocation of the hip (DDH) immobilized in spica casts. **Methods:** This study included 20 hips in 16 patients, with a mean age of 19.6 months. Closed reduction was performed under general anesthesia preceded by percutaneous adductor tenotomy, then a spica cast was applied in the human position. Post-reduction plain radiographs besides CT scans were performed to ensure there was no evidence of residual subluxation. Interpretation of CT scan images was performed using three criteria: modified Shenton's line (MSL); posterior neck line (PNL); and femoral head coverage (FHC). **Results:** A successful closed reduction was achieved in 16 hips (80%). While in four hips (20%) closed reduction failed and had to be followed by open reduction. The best sensitivity was observed in FHC (100 %), the best specificity and accuracy were observed in PNL (87.5% and 85% respectively). The criterion that gave the best reliability for adequacy of reduction was the PNL (82.2%), followed by MSL (78.7%), then FHC (70%). **Conclusions:** CT is an accurate technique in assessing adequacy of reduction of DDH through a spica cast. The PNL is described as the preferred method to confirm the adequacy of hip relocation on multi-slice post reduction axial CT scanning. **Keywords:** DDH - CT scan - Posterior neck line - Modified Shenton's line - Femoral head coverage

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Abstract no.: 48434

COMPARISON OF FEMORAL LENGTH IN UNILATERAL HIGH RIDING DEVELOPMENTAL DYSPLASIA OF THE HIP : AVOID LIMB LENGTH DISCREPANCY AFTER HIP ARTHROPLASTY

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introduction:limb length discrepancy(LLD) is one of the major reasons of dissatisfaction after total hip arthroplasty (THR).in unilateral high riding dysplasia of the hip (DDH), limb equalization is also one of the main concerns of the patients.the purpose of this study was to see what is the natural history of unilateral DDH regarding the length of femur on dislocated side comparing to normal side.methods:60 adult patients with unilateral high riding DDH without any previous surgery included who has digital scanograms.measurements was done by hip surgeon., one fellow of hip surgery and one radiologist with excellent inter observer and intra observer reliability.measurements was done from tip of greater trochanter(GT), lesser trochanter(LT) and the head to inferior surface of medial femoral condyle.results:overall 2% has equal length of femurs.in 54 % of cases the femur on the dislocated side was longer and in 44% the involved side femur was smaller with the mean difference of 9 mm .conclusion:in every unilateral high riding DDH that is candidate for THR scanogram should be done preoperatively . in more than half of the cases the femur is longer in the dislocated side and it should be considered during arthroplasty to avoid LLD and extra lengthening.

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Abstract no.: 48711

ACCURATE LEG LENGTH CORRECTION FOLLOWING TOTAL HIP ARTHROPLASTY UTILISING A VERTICAL MEASUREMENT SYSTEM AND SMARTPHONE BASED APPLICATION

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Introduction: It is well established that accurate restoration of leg length is essential to good clinical outcome following total hip arthroplasty (THA). In order for leg length to remain unchanged following THA the amount of bone resected during the femoral neck cut and acetabular reaming must be accurately replaced by the arthroplasty components. We present a technique whereby a validated vertical height measurement device is used in conjunction with a purpose designed mobile device application to accurately predict intra-operative leg length adjustment. **Methods:** A simple mathematical formula is used to define leg length correction (LLC); $LLC = a - b - c + d$ where (a) combined vertical height of the components according to the manufacturer specifications, (b) the measured vertical height of the resected femoral head, (c) the amount of superior acetabular reaming and (d) the vertical height of the femoral component relative to the neck cut. **Results:** Intra operatively the resected head was measured and the formula was applied utilizing the mobile device application. The desired correction ranged from 0mm to 18mm. In all cases the post-operative correction was within 4mm of the pre-operative planned correction. Statistical analysis showed that a linear regression with 'Actual' as dependent and 'Lambda' as independent variables resulted in $R = 0.889$. **Discussion:** In an age where medical solutions are becoming rapidly more complex and expensive we present an innovation which is both accurate and time/cost saving. Of note the device was found to be as accurate in the hands of junior surgeons as their senior colleagues.

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Abstract no.: 47307

WHAT IS THE OPTIMAL TARGET ZONE FOR HIP GEOMETRY RECONSTRUCTION TO IMPROVE OUTCOME FOLLOWING TOTAL HIP ARTHROPLASTY?

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Introduction: The aim of this prospective cohort study was to determine the optimal target zone for multiple parameters of hip geometry reconstruction to improve the clinical outcome following total hip arthroplasty (THA). **Methods:** A consecutive series of 162 primary unilateral cementless THAs was evaluated pre-operatively and at 2.0-4.8 years postoperatively. Radiographic measurements were performed by 2 independent and blinded observers on standardised radiographs. The following parameters were assessed: center of rotation (COR), acetabular/femoral/hip offset (AO/FO/HO) and vertical position of the centre of rotation (CORH). Radiographic inclination and anteversion of the cup were measured using a validated formula. The accuracy of geometrical reconstruction relative to the contralateral hip was assessed and various target zones were tested as optimal (Offsets in $\pm 5\%$ and CORH in $\pm 25\%$ zones). Different ranges of potential target zones ($\pm 5^\circ$, $\pm 10^\circ$) and of various inclination ($35-45^\circ$)/anteversion ($5-25^\circ$) combinations were evaluated. Non-parametric tests and multi-variate linear regression analysis were used in order to identify which target zones were associated with superior clinical outcome (Δ HarrisHipScore). **Results:** Patients with both accurate reconstruction of HO (0-10%) and CORH ((-25%)-(+25%)) demonstrated significantly better outcome than patients with hip reconstruction outside this zone (HHS:49vs.37; $p=0.010$). No optimal zone for combined cup inclination/anteversion being associated with superior outcome could be identified. Adjusted multi-variate analysis did not demonstrate any significant correlation between Δ HHS and reconstruction parameters. **Conclusion:** Our results suggest that patients with most accurate reconstruction of hip offset and vertical position of the center of rotation have better clinical outcome than patients outside this zone.

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Abstract no.: 47483

HIGH REVISION RATE OF THE REJUVENATE MODULAR NECK FEMORAL STEM AT 3 – 5 YEARS FOLLOW-UP

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Introduction: We previously reported a 28% short-term corrosion-related revision rate of recalled Rejuvenate modular stem. The purpose of this study was to assess the mid-term clinical results and survivorship of this implant. **Methods:** Between June 2009 and July 2012, 73 total hip arthroplasty (THA) in 63 patients with the Rejuvenate modular neck implant were performed and prospectively followed. Elevated metal ion ($> 2 \mu\text{g/L}$), pain, or positive MRI findings were indication for revision surgery. Correlation between patient factors with serum metal ion levels and revisions were analyzed. **Results:** At an average follow-up of 4.2 ± 0.6 years (3.0 to 5.5), 57 hips (48 patients, 78%) were revised at mean of 3.2 ± 1 years (1 to 5.5); and 6 other have been scheduled for surgery. The Kaplan-Meier survivorship was 22 % at 5.5 years. 51 of 57 hips undergoing revision (89%), had elevated preoperative serum Co levels, 24 (42%) had elevated preoperative Cr. The average serum Co and Cr ion levels prior to revision surgery were $10 \pm 8 \mu\text{g/L}$ (0.3 to 40) and $2.3 \pm 1.5 \mu\text{g/L}$ (1 to 7.4), respectively. 52 hips underwent MRI evaluation, 22 hips (42%) had positive findings correlated to pain ($p=0.025$): 11 hips demonstrated adverse local soft tissue reactions and 11 hips showed evidence of pseudotumor. **Conclusions:** At mid-term follow-up, 86% of the Rejuvenated modular neck stems have been revised or awaiting revision. Given these findings, all patients with a Rejuvenate modular neck stem implant should be followed closely and advised of impending failure.

Date: 2017-12-02

Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47493

CEMENTED OR CEMENTLESS TOTAL HIP ARTHROPLASTY, HOW TO MAKE THE RIGHT CHOICE?

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Cemented fixation was the first method to fix stems and cups for Total Hip Replacement (THR). Excellent long term outcomes have been reported, though its mechanical qualities degrades over time. More than 20years ago, hydroxyapatite, was introduced as a coating for cementless hip prostheses. Hydroxyapatite may facilitate primary stability and osteointegration of implants, however, incidence of thigh pain and femoral fractures are related. We investigated whether 3D CTscan preoperative planning can help to choose between cemented or cementless fixation. 120patients (mean age 62yo) were reviewed, 40 with cemented THR, 80 with cementless THR. Pre-operative 3D planning was performed (HIP Plan, Symbios) during which a small bone volume density around the lesser trochanter was analyzed. A threshold of 70Hounsfield units(HU) was chosen according to our habits. Under 70HU patients received a cemented stem. Above 70HU they received a press fit stem. All patients underwent anterior approach without fracture table, by a single experienced operator. Thigh pain during the first 3months and peri operative fracture were evaluated. Two hips had thigh pain, both were cementless. Two hips had femoral fractures, 1 intraoperative and 1 postoperative. All in the cementless group. Clinical outcomes were excellent with average HHS score at the end of follow up of 97 and PMA of 17. To our knowledge there have been no studies done on protocol to choose prosthetic stem fixation technique. We believe that bone density analysis obtained with pre-operative CTscan can play a major role in the choice between cemented and uncemented stems.

Date: 2017-12-02

Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 48715

RISK FACTORS FOR EARLY REVISION AFTER TOTAL HIP AND KNEE ARTHROPLASTY

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Introduction: Over 83,000 primary hip replacements (HR) and 91,000 knee replacement (KR) were registered in the National Joint Registry for England, Wales and Northern Ireland (NJR) in 2014 and 8,900 hips and 5,800 knee replacements were revised. This is the first UK based study that utilises national administrative data to identify significant demographic and surgical risk factors for early revision of hip and knee arthroplasty within 3 years of the primary procedure. Methods: Hospital Episodes Statistics (HES) is the national hospital administrative database for England that we used to extract data on those patients who had early revision within three years of the index procedure between 2006 and 2011. Results: The significant variables ($p < 0.01$) associated with early revision of both HR and KR were younger age, male gender (OR 1.11 for HR and 1.42 for KR), type of operation including hip resurfacing (OR 2.26), cementless HR (OR 1.46), PFJ replacement (OR 6.03), UKR (OR 2.82) and greater number of emergency admissions. There were a greater number of co-morbidities including rheumatic disorder, pulmonary disorders, drug and alcohol abuse and obesity that increased the likelihood of early revision in HR. Those linked with KR revision were Parkinson's disease and diabetes. Conclusions: It is becoming more important to minimise the increasing burden of revision surgery through a comprehensive understanding of the risk factors. This study provides important knowledge for both patients and clinicians and will ultimately enable improved patient consent for primary arthroplasty and therefore patient selection and optimisation.

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Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47875

THE EFFECT OF TIME INTERVAL AFTER ACCIDENT ON CLINICAL OUTCOME AFTER HIP FRACTURE SURGERY

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Background: Choosing the ideal time for performing hip surgery in injured patients still remains controversial. Aim of Study: To evaluate mortality after one year as primary parameter, and various surgical und general complications in two groups of patients, according to their time to surgery interval. Material and Methods: The study group included 1060 patients, who received an operation due to a fracture of the hip. Criteria for inclusion were per- and subtrochanteric- as well as femoral neck fractures. According guidelines and fracture classification patients have been operated either by short or long intramedullary implants, screw fixation hemi or total hip replacement. Study population was divided into two groups, whereas group I received the hip surgery within 24 hours after the accident, and group II after 24 hours. Results: 331 male (31.2%) and 729 female (68.8%) patients with a mean age of 77.9 ± 13.6 years have been included. According fracture type, 49.5% of the patients were operated because of femoral neck fractures, 42.7% of pertrochanteric followed by 7.7 % of subtrochanteric fractures. Based on time of surgery after initial accident and clinical outcome, the rate of mortality was 26.5% in group I, even higher in group II with 41%. Implant complication rate in dependence of time of surgery showed higher rates (16%) in group I compared to group II (14%). Conclusion: Hip surgeries within 24 hours after accident seems recommendable due to better clinical outcome and lower mortality rate, showing slightly higher rates of implant and operation-related complications.

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Abstract no.: 47269

MID-TERM RESULTS OF OPEN DEBRIDEMENT FOR LABRAL TEAR USING ANTEROLATERAL APPROACH WITH A MINI-INCISION

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This study evaluated the mid-term results of open debridement for labral tear using anterolateral approach. The retrospective study was done to evaluate clinical and radiologic mid-term results in 82 patients (100 hips) undergoing open debridement for labral tear between June 2006 to March 2010. Fifty-five patients (68 hips) were included in this study after exclusion criteria were applied. Perioperative outcome scores including the Harris Hip Score (HHS) and the Western Ontario and McMaster Universities (WOMAC) Index were used to assess clinical improvement after surgery. Also we also evaluated the degree of patient's satisfaction, rates of revision surgery and conversion to total hip arthroplasty (THA). Tönnis grade on plain radiographs was used to assess progression of osteoarthritis. There were 20 male (24 hips) and 35 female (44 hips) and the average age was 42.9 years (range, 19-67). The mean follow-up duration was 7.5 years (range, 2.0-9.9). The HHS improved from 70.2 (range, 46-82) preoperatively to 89.8 (range, 70-100) at the last follow-up. The WOMAC score also improved from 50.3 (range, 29-82) preoperatively to 12.3 (range, 0-40) at the last follow-up. At last follow-up, clinical improvement showed no significant correlation with preoperative Tönnis grade on plain radiographs ($P > 0.05$). Eight patients (9 hips) underwent revision surgery. There was one patient with early chondrolysis and she had total hip arthroplasty. Open debridement for labral tear using anterolateral approach with a mini-incision shows relatively good clinical outcome with average 7.5 years follow-up.

Date: 2017-12-02

Session: Hip Short Free Papers

Time: 08:00 - 10:00

Room: 10. Room 1.64

Abstract no.: 47863

CHALLENGES AND EARLY OUTCOME OF TOTAL HIP REPLACEMENT SURGERY IN SICKLE CELL DISEASE PATIENTS

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Nigeria has a high burden of Sickle Cell Disease (SCD), and Total Hip Replacement (THR) for osteonecrosis of head of femur in this group of patients is technically demanding due to proximal femoral sclerosis and nature of acetabulum. Present study is targeted at identifying centre specific challenges, complications and early outcome of THR among SCD patients, with the aim of recommending measures that can improve clinical outcome and healthcare delivery. All SCD patients that presented for THR were recruited into the study. Patient's demographics, perioperative clinical details, radiologic assessment and Harris hip scores both at 2 years follow up, were recorded. A total of 17 total hip replacement surgeries were done in 15 patients. The mean age of patients was 30.6 years. Locating and broaching the medullary canal was a major challenge as 50 % of the hips had absent proximal medullary canal. Common complications included calcar split (23.5%), anaemia (23.5%) and femoral perforation (11.8%). At 2 years, improvement in Harris hip score was observed in 100% of the patients and radiolucency around stem in 11.8% (2 patients). Early outcome of surgery is satisfactory. However, extra attention to details intraoperatively is needed to reduce the incidence of complications and measures put in place to overcome them. We recommend use of fluoroscopy or image intensifier in locating and reaming sclerotic medullary canals and possibly, prophylactic wiring around the calcar femorale done prior to broaching and stem component insertion to avoid calcar splits.

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Room: 10. Room 1.64

Abstract no.: 47517

DIRECT ANTERIOR VS LATERAL APPROACH FOR TOTAL HIP ARTHROPLASTY

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Introduction: The direct anterior approach (DAA) has recently gained popularity around the world. Methods: The authors conducted a retrospective study on a group of 534 consecutive patients underwent total hip arthroplasty (THA) by single surgeon in 2008 - 2012. In 205 patients DAA was utilized and 329 patients underwent lateral approach (LA). Assessment of the two groups involved following parameter: length of surgical procedure, intra- and postoperative complications, transfusion rate, pain score, length of stay, ambulation and discharge disposition. Results: The two groups were homogeneous for age (DAA - 62.1, R=21-89, LA -60.7, R=18-88), gender (DAA -42/58%, LA - 47/53% male/female ratio) and BMI (DAA-32,LA-33). Blood transfusion rate was 3.4% in DAA group and 3.1% in LA group. Adverse events reported in 5.8% of LA group and 6.3% of DAA group. Patient experienced less pain in DAA group (PT pain score 5.2 vs 6.0 at 24 hours and 4.0 vs 4.4 at 48 hours, 0-10 scale). Length of stay was shorter in DAA group (2.4 vs 2.7 days), also more patients were discharged directly home in DAA group (97% vs 84%). Patients walked longer distance in DAA group (141.5 vs 109.2 feet at POD1, 194.1 vs 173.7 feet at D/C) with less assistive device use. Conclusion: .The early recovery period favors the direct anterior approach due to a faster return to normal walking and independence from assistive devices, such as a cane or walker. Lateral thigh pain, numbness and paresthesia were the most common complication for DAA.

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Abstract no.: 47802

MINI-NUTRITIONAL ASSESSMENT AND VITAMIN D STATUS IN PERIPROSTHETIC FEMUR FRACTURES

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Introduction: Periprosthetic fractures are rare but there is a rising prevalence. The risk factors for developing these fractures need to be investigated. We carried out a prospective observational study of consecutive patients with periprosthetic femur fractures. A mini-nutritional assessment tool was utilized and serum vitamin D levels were determined. Results: 7 patients were identified of which there were 5 males and 2 females. The mean age was 75.4 years (64-80). 6 hips (5 Vancouver B2 and 1 Vancouver B1) and 1 knee (Su & Associates type 2) were involved. Comorbidities were hypertension, HIV, COPD, previous CVA, and epilepsy. For the hips median time from index procedure to fracture was 3 months (3 weeks -17 months). 3 were cemented and 3 uncemented. All had previous neck of femur fractures. Fall risks were epilepsy, previous CVA and alcoholism. Average calcium was low 2.10mmol/L (1.95-2.29). 6 cases had low albumin with average of 30.1g/L (26-40). Vitamin D levels were reduced with only 2 cases with normal levels. One case had low vitamin B12 levels. One case had conservative treatment and the subject died from nosocomial sepsis. The rest had revision surgery and there was no sepsis or dislocations. Discussion: Our study reveals a high prevalence of protein-energy malnutrition and vitamin D deficiency in elderly patients with periprosthetic femur fractures. Poor diet, alcoholism, medical comorbidities and a high fall risk play a role. Subjects may tolerate revision surgery but nutritional supplementation and osteoporosis treatment is advised to prevent these fractures from occurring.

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Abstract no.: 47896

CLINICAL OUTCOMES AFTER ARTHROSCOPIC ILIOPSOAS RELEASE

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Introduction: Iliopsoas impingement (IPI) has recently been categorized as one of the causes of labral pathology and anterior hip pain. Methods: From January 2014, we diagnosed 27 cases of IPI clinically and radiologically. Clinical symptoms and signs included anterior snapping, anteromedial tender point, positive impingement test and positive modified Thomas test. Radiological diagnosis was done using magnetic resonance arthrography. In addition, arthroscopic confirmation of the condition through identification of the direct anterior site of the labral pathology between 2-3 O'clock position just beneath the tight tendon was done. Surgical management in the form of arthroscopic iliopsoas tenotomy through the central compartment at the level of joint line as well as arthroscopic management for the associated labral, condral and bony pathologies. Final Evaluation was done clinically after 12 months postoperative, including assessment of the modified Harris hip score (mHHS), modified Thomas test and assessment of the hip flexion power in comparison with sound side. Results: Labral pathologies varied from inflammation and degenerative changes in (20 patients) to a full tear (7 patients). Labral repair was only done in 3 patients. Clinical evaluation showed full power regain, negative impingement and modified Thomas test in all patients. Although Modified HHS improved (mean of 17 points), this was affected by other associated pathologies found. A painless audible click at the anterior aspect was noted in 7 patients. Discussion: Clinical outcomes after arthroscopic Iliopsoas release showed encouraging results with low complications rate with a full strength recovery of the muscle.

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Abstract no.: 46333

VIABILITY AND TISSUE QUALITY OF CARTILAGE FLAPS FROM PATIENTS WITH FEMOROACETABULAR HIP IMPINGEMENT: COMPARISON WITH MATCHED CONTROLS

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The purpose of this study was to evaluate viability and tissue quality of chondral flaps from patients undergoing hip arthroscopy for the treatment of FAI cam lesions. The lesions were localized and classified according to Beck's classification. Each patient had a chondral flap (study group) and a perifoveal cartilage sample (control group) excised. In both groups, cartilage viability was examined with Live/Dead staining, and tissue quality under light microscopy. Immunohistochemistry for collagen II was performed, and graded with the OARSI system. Image-J software was used for calculating cartilage viability and collagen II stain percentage. Ten male patients with a mean age of 38.4 years old were enrolled. All chondral lesions were classified as Beck grade 4. The average cartilage viability was reduced (54.6 % 25.6/38.8% 30.3) and degenerated (4 1.3/3.5 1.4) for the study and control group, respectively. There was no intergroup difference for cartilage viability ($P=0.2$) and tissue quality ($P=0.6$), nor intragroup correlation between cartilage viability and tissue quality ($P>0.05$). A negative correlation ($r=-0.9$, $P=0.035$) was found between OARSI and collagen II percent scale. Both groups had reduced cartilage viability and suboptimal tissue quality. This study shows loss of viability and histological degeneration in chondral flap from patients with hip FAI cam lesions.

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Room: 10. Room 1.64

Abstract no.: 46387

THE SAFETY OF AIR ARTHROGRAPHY IN INTRA-ARTICULAR HIP INJECTIONS

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Background: Intra-articular hip injections are important clinical adjuncts in the evaluation and treatment of the painful hip in both the adult and paediatric populations. Anatomic landmarks and tactile feedback are usually considered insufficient at the level of the hip in order to position the needle with up to 40% of hip injections performed 'blind' being extra-articular. Methods: Data was retrospectively collected for all adult patients (age \geq 16yrs) who underwent a hip injection between Feb 2005 and Nov 2016 at a single tertiary hospital in the UK. Patients with ipsilateral hip prostheses, any contra-indication to joint injections (e.g. infection overlying injection site, intra-articular fracture, unstable coagulopathy) or had no capacity to give informed consent were excluded. Information collected included age, gender, BMI, injection type (local anaesthetic only or in combination with steroid) radio-opaque contrast or air arthrogram to confirm needle placement), and associated complications. Results: The data from 984 patients (1045 injections) were included. In 590 injections, air arthrography was used to confirm needle placement, 166 cases used radio-opaque contrast medium and no method of confirming intra-articular placement was documented in 289 cases. There were no recorded episodes of superficial or deep infection, and no neurovascular injury. Steroid flare was reported in 5 patients, and there were no documented cases of air embolisms. Conclusions: Our data suggest that air arthrography of the hip offers a safe and cost-free alternative to conventional contrast arthrography, without the potential risks/complications of iodinated contrast. In particular, no air embolisms were seen in our series.

Date: 2017-12-02

Session: Knee Short Free Papers

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Room: 10. Room 1.64

Abstract no.: 48811

**REDUCTION OSTEOTOMY OF THE PROMINENT TIBIAL TUBERCLE
AFTER OSGOOD-SCHLATTER'S DISEASE**

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(SWITZERLAND)

Purpose: The purpose of this study was to evaluate the functional and clinical outcome of a new closing wedge osteotomy for the prominent tibial tubercle after Osgood Schlatter's disease. **Methods:** Between 2010 and 2014 seven consecutive adults (mean age 28.6 y; range 26-35y) were treated by closing wedge reduction osteotomy of a painful tibial tubercle. All patients had prior non-surgical and surgical treatment. Preoperative and postoperative tubercular prominence, Caton-Dechamps index for patellar height, the Kujala Anterior Knee Score (KAKPS), Lysholm Knee Score (LKS) as well as VAS score and Tegner activity scores were recorded. **Results:** Mean follow up after reduction osteotomy was 31.3 months (27-41 months). The bony prominence of the tibial tubercle was significantly reduced (mean 8mm, $p<0.001$) and the Caton-Dechamps index was lowered from 1.29 to 1.09 ($p<0.001$). From preoperative to last follow up KAKPS increased from 54.71 preoperative to 84.71 ($p<0.001$); LKS improved from 72.42 to 94.14 ($p<0.001$); Tegner activity score increased from 3.1 to 5.7 ($p<0.001$), whereas the VAS significantly decreased from 5.8 to 1.2 ($p<0.001$). No complications were recorded and all patients were satisfied with clinical outcome. **Conclusion:** Closing wedge osteotomy of the tibial tubercle effectively reduced the bony prominence after OSD and consecutively improved the outcome in terms of knee pain and function. Thus, we can recommend this procedure in selected patients.

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Abstract no.: 47559

EARLY CLINICAL RESULTS OF ABDOMINAL SUBCUTANEOUS ADIPOSE TISSUE-DERIVED MESENCHYMAL STEM CELL (ADMSC) INJECTION FOR KNEE OSTEOARTHRITIS

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Mesenchymal stem cells (MSCs) are known to have a potential for articular cartilage regeneration. Abdominal subcutaneous adipose tissue which has been discovered as a potential source of MSCs, is easy to access and has less donor site morbidity. In the present clinical study, we aimed to evaluate the early outcomes of abdominal subcutaneous adipose tissue-derived stem cells (ADSCs) injection for the treatment of mild to moderate knee osteoarthritis. Study was approved by the Ethical Committee of Bezmialem University. Inclusion criteria's were Kellgren– Lawrence stage 2-3 gonarthrosis with a history of more than 3 months of knee pain. Patients were underwent arthroscopic debridement of the knee joint and MSCs were collected from abdominal adipose tissue by stromal vascular fraction technique in the same procedure and injected to the knee. Charts were analyzed for demographics, clinical symptoms, Lysholm, knee injury and osteoarthritis outcome score (KOOS) and visual pain score (VPS). Thirteen knees of 9 patients (7 female, 2 male) with a mean age of 62.5 (range 51-69) were included. Pre-operative mean Lysholm score was 42.5 (poor) and KOOS was 37.8 and VPS was 8.1. An average of 6 months (range 3-12) follow up, mean Lysholm score was increased to 70.5 (fair) and KOOS was increased to 66.9 and VPS was decreased to 4.8 respectively ($p=0.07$, $p=0.45$, $p=0.76$). Range of motion was not changed significantly. In conclusion, although there was no statistical significance, clinical and functional scores were improved and pain was decreased in a short period of time.

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Abstract no.: 47853

DOES KNEE SIZE AFFECT THE RELIABILITY OF TIBIAL TUBERCLE-TROCHLEAR GROOVE MEASUREMENTS USING CT SCAN?

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Background: lateralized tibial tubercle is a cause of patellar instability. Before proceeding with reduction of the tibial tubercle–trochlear groove (TT-TG) distance, surgeons prefer to know whether this distance is pathologic. When contrasting normal TT-TG distances with pathologic one, some authors report a pathologic threshold of 14.4 mm, whereas the average TT-TG distance in asymptomatic control subjects was 12.7 mm. Methods: We sought to determine variability in the traditional TT-TG distance versus the anthropometric knee size, using dimensions of the distal part of the femur (TT-TG and femoral medial-lateral (M/L) distances) of 50 CT of pathologic and control knees. Results: The dominant statistical modes of variation of TT-GT distance were associated with size (M/L) and shape (normal for control or throchea dysplasia) of the distal femur. The average TT-TG distance measured 10.1 mm in normal knees and 20.1 mm in pathologic knees. The variability in measurements between normal and pathologic knees varied respectively between +/-5 mm and +/-15 mm, with as consequence absence of threshold value between normal and pathologic knees. These measurements were supplemented by an analysis of a size ratio coefficient. It was calculated by dividing TT-GT distance by ML width of the femur. This size ratio coefficient correction allowed a better prediction of TT-GT distance according to size of knee and decreased variability for normal and symptomatic knees resulting in different pathologic threshold value of TT-GT distance. Conclusions: The average TT-TG distances in normal and pathologic knees were not identical for each size of knees.

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Abstract no.: 46927

MANAGEMENT OF KNEE FLEXION CONTRACTURE IN HAEMOPHILIA WITH ILIZAROV TECHNIQUE AND PASSIVE MOTION

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Background: There are limited reports about management of Knee flexion contracture (KFC) in haemophiliacs with Ilizarov technique. The aim of this study was to retrospectively analyze the results of Ilizarov technique to treat KFC. **Methods:** Between December 2009 and September 2015, we retrospectively reviewed seven patients (ten knees) who underwent continuously distraction with Ilizarov technique and manual passive motion. There were six patients with haemophilia A and one with haemophilia B, with an average age of 17 years old (range, 11 to 24 years). The mean preoperative flexion contracture was 58 degrees (range, 30 to 95 degrees). The mean preoperative range of motion of the knee joint was 64 degrees (range, 15 to 110 degrees). The average time of follow-up was 39.3 months (range 16 to 85 months). **Results:** The mean duration of distraction was 40.6 days (range 21 to 60 days) and the average time of hospital stay was 34.7 days (range 17 to 78 days). All the patients achieved full correction at the end of distraction. The mean ROM of the knee joint at the last follow-up was 38 degrees (range, 20 to 90 degrees). One patient suffered from transient numbness of left leg, and all the patients had loss of knee flexion at last follow-up. **Conclusions:** The patients in this study got complete correction of KFC with Ilizarov technique and manual passive motion. However, all of them had loss of knee flexion was the main complication.

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Abstract no.: 48501

COMPARISON BETWEEN IN VIVO KINEMATIC ANALYSIS OF TOTAL KNEE REPLACEMENT AND UNICOMPARTMENTAL KNEE REPLACEMENT IN INDIAN PATIENTS

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Kinematic analysis of the knee replacement prosthesis helps us understand and predict the functional outcome after the surgery. Oxford Unicompartmental Knee replacement (UKR) is a ligament preserving surgery whereas Total Knee Replacement using requires sacrificing both Anterior and Posterior cruciate ligament. We compared the effect of the two surgeries on knee kinematics. 30 patients following unicompartmental knee Replacement (UKR) and 30 following Total Knee Replacement (TKR) were asked to perform step up and deep knee bend exercises under X-ray fluoroscopy. These two groups had no difference in the outcome scores (Oxford Knee Scores at 1 year follow-up). The fluoroscopy video thus created for each patient was analysed using MATLAB software (version 7.10.0.499; R2010a). The relationship between Patellar tendon Angle (PTA) and Knee Flexion Angle (KFA) was plotted at 10 degree interval of knee flexion. There was a linear relationship between the PTA and KFA in both the groups. On applying Mann Whitney U analysis, the two groups differed significantly among each other. The UKR differs from TKR as it preserves the native ligaments of the knee and hence has a different kinematic profile. The kinematics of knee following UKR resembles the normal knee joint more closely as compared to knee kinematics following TKR and this would result in a better functional outcome.

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Abstract no.: 47819

**TOTAL KNEE REPLACEMENT- DOES TOURNIQUET USE EFFECT
EARLY REHABILITATION AND LENGTH OF STAY?**

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KINGDOM)

Background: Total knee replacement is commonly performed using tourniquet despite being associated with adverse outcomes that may affect post-operative recovery and early rehabilitation. Objectives: To evaluate the effects of tourniquet use on TKA patients with regards to early rehabilitation, functional and clinical outcomes and the knee range of motion. Material and Methods: 29 bilateral sequential TKA under a single surgeon with their first TKA using tourniquet and the second without tourniquet were included. Prospective follow-up for at least 6 months. All patients had the same early rehabilitation protocol for both knees. Primary outcomes were Oxford Knee score and knee ROM. Secondary outcomes were surgical time, intra-operative blood loss, postoperative pain, post-operative leg swelling, analgesic and transfusion requirements. Results: In 25 patients the second TKA performed without the use of tourniquet showed a better outcome in Oxford score and better early range of movement than their first knee at 6 weeks follow up. No significant difference was detected at 6 months. Postoperative pain, leg swelling and analgesic consumption were less in second TKA. Surgical time was similar while blood loss was greater when not using tourniquet but no postoperative transfusion was required. Length of hospital stay was shorter in the second TKA. Conclusions: TKA without the use of a tourniquet results in faster recovery and better patient satisfaction. It also prevents rebound pain and swelling associated with early rehabilitation in some TKA patients when using a tourniquet. Furthermore analgesic use was reduced in addition to reduced length of stay.

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Room: 10. Room 1.64

Abstract no.: 46555

TOTAL KNEE POSTOPERATIVE BLOOD LOSS MANAGEMENT – MIS VS. STANDARD AND TRANEXAMIC VS. NON - TRANEXAMIC ACID PERIOPERATIVE USAGE COMPARISON

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Introduction: Tranexamic acid (TXA) $C_8H_{15}NO_2$, is antifibrinolytic that has been known since 1962. Its perioperative administration in patients undergoing total knee arthroplasty (TKA) has shown great decrease in blood loss and need for transfusion. We present our MIS vs. standard approach and tranexamic vs. non tranexamic comparison results.

Material and methods We included all patients that underwent total knee surgery during 12 months prior (114) and 12 months after start (113) of TXA usage at our department. Parameters we analysed were blood loss in drainage, HGB level for the first, second and seventh postoperative day, need for transfusion and possible DVT. Comparisons were done accordingly to TXA usage, gender and surgical approach.

Results: Our results showed great decrease in postoperative blood loss for both MIS (from 1050ml to 500ml) and standard (from 1425ml to 675ml) surgical approach compared to non-tranexamic group and significantly higher postoperative HGB levels in tranexamic group. Need for blood transfusion decreased from 49,1% in non-tranexamic group (48,1% MIS and 50,58% standard) to 14.2% in tranexamic group (21,7% MIS and 12,2% standard). Total number of administered red cell units in non-tranexamic group was 161 and in tranexamic group was 32. There wasn't any DVT in either group.

Conclusion: Results suggest that tranexamic acid has high efficiency in total knee perioperative blood loss management decreasing need for blood transfusion with a fraction of costs. We found less average bleeding with MIS approach in both groups but higher transfusion rate in tranexamic group.

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Session: Knee Short Free Papers

Time: 10:30 - 12:00

Room: 10. Room 1.64

Abstract no.: 46469

THE EFFECT OF ORAL TRANSEXAMIC ACID ON POST-OPERATIVE KNEE ARTHROPLASTY PATIENTS; A PROSPECTIVE RANDOMISED CONTROL TRIAL.

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Background The blood-sparing effects of Tranexamic acid has been well documented in the scientific literature. In elective Orthopaedic surgery, intravenous perioperative Tranexamic acid has become commonplace particularly in knee and hip arthroplasty. Little evidence exists on the usage of oral Tranexamic acid in the post-operative period. The aim of this study was to investigate the effects of post-operative oral Tranexamic acid on Haemoglobin (Hb), leg circumference and knee flexion following elective knee arthroplasty. **Methods** Twenty patients undertaking elective knee arthroplasty were included in this prospective randomised single surgeon study. Exclusion criteria included a personal history of embolus or thrombus or revision arthroplasty. Random number generator was utilised to randomly divide the group into receiving oral Tranexamic acid (n= 10) or placebo (n= 10). Two days of oral Tranexamic acid was administered postoperatively. Hb and Haematocrit (Hct) were measured on both post-operative days as well as bilateral leg circumference. The Surgical Wound Assessment Score (SWAS) was used to objectively quantify wound appearance. **Results** The oral Tranexamic acid group demonstrated a trend in increased Hb/Hct ratio compared to the placebo group. This did not reach statistical significance. No statistical significance in knee flexion was demonstrated between either group. **Conclusion** The administration of oral Tranexamic acid postoperatively shows some promising trends in further blood preservation post knee arthroplasty. A larger patient cohort may prove to demonstrate statistical significance.

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THE ROTATIONAL MISMATCH BETWEEN FEMORAL AND TIBIAL COMPONENTS AFTER TOTAL KNEE ARTHROPLASTY WITH RANAWAT FEMORAL CUTTING BLOCK

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Rotational mismatch of the tibial component on the femoral component within $0^{\circ}\pm 10^{\circ}$ is associated with better function after mechanically aligned total knee arthroplasty (TKA). Although proper rotational alignment of the femoral component is one of the critical keys for a successful TKA, controversy remains regarding the optimal intraoperative reference to determine femoral component rotation. The purpose of this study was to evaluate the rotational mismatch between the femoral and tibial component after mechanically aligned TKA with Ranawat femoral cutting block. Sixty knees which underwent primary TKA for the varus osteoarthritis of the knee with image-free navigation were reviewed. Those knees used mobile-bearing prosthesis (L.C.S; Depuy) were aligned mechanically. The femoral rotational alignments were determined according to the Ranawat femoral cutting block and tibial rotational alignments were determined by the tubercle landmark technique. The rotational mismatch between femoral and tibial components in neutral position were evaluated computed tomography postoperatively. We could evaluate intraoperative knee kinematics dynamically with Navigation. The average rotational mismatch of both components was 4.7° internal rotation of the tibial component relative to the femoral component. There was a wide range of variation from 26° internal rotation to -16° external rotation of the tibial components. The rotational allowance of the mobile mechanism influences positively knee kinematics, including patellofemoral tracking. But, over 20% of the knees were outliers in our study with traditional surgical procedure of L.C.S. For further reduction of the range of malrotation, we should be aware of more intraoperative findings such as gaps and kinematics in addition to bony landmarks.

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RETURN TO SPORT POST KNEE REPLACEMENT: EBM

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The post-operative advices and expectations about return to sport (RTS) and physical activities (PA) post total and unicompartmental knee arthroplasty (TKA and UKA) are inconsistent and often empirical. Aim of this study is to report the evidence based medicine (EBM) about RTS and PA after TKA or UKA and how much RTS and PA are advisable, possible and recommendable. OMS database proves that inactivity is the fourth risk death factor over the world and over countries with high salary expectations, indeed the 41% of men and 48% of women don't reach minimum advisable physical activity level. Return to sports and physical activities after TKA or UKA is an achievable outcome according to EBM (36%-89% for TKA and 75%-100% for UKA). In literature, there aren't clinical studies which definitively demonstrate an earlier failure of the implant due to sport activities. Many confounding factors complicate data interpretation: the definition itself of RTS, the influence of empiric carefulness, the comorbidities, the psychosocial factors and the expectations of desired outcome. Physical activities following TKA and UKA are absolutely advisable to maintain an healthy and active life style according to OMS. Return to sports is possible following TKA or UKA especially for low and medium impact sports. Return to sports and physical activities is recommendable complying with OMS directions but is still not possible to predict the prosthetic survivorship in relation to wearing, that is a function of use not time.

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LONG TERM OUTCOME OF KNEE ARTHROPLASTY IN PATIENTS UPTO 40 YEARS OF AGE

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Introduction: With ever increasing demand for primary total knee arthroplasty (TKA) in young patients, the concern amongst Surgeons about longevity is understandable. This study analyses long term outcome of knee replacement in patients upto 40 years of age. **Methods:** Clinical and radiological outcomes of 59 consecutive knees (44 patients) with primary knee arthroplasty for patients between 1975 and 2012. Data was collected till the latest follow up. Revision for any reason was considered as primary end point. Surrogate end point was radiological evidence of aseptic loosening. **Results:** Mean age at index operation was 33 (range 18-40). Average follow-up – 16.8 years (range 1.2 - 41). TKA were performed for secondary arthritis in all patients. Reason for replacement was rheumatoid arthritis – 46, post traumatic – 3, infective arthritis – 2, psoriatic arthritis – 1, ankylosing spondylitis – 1, Larsons – 1, Klippel Feil – 1, synovial chondromatosis – 1. Type of implants used included PFC Knee – 34, LCS – 7, Total Condylar Knee – 5, Kinematic Knee – 3, Load Angle Inlay Knee – 5, Genesis – 1. Survival with revision as end point is 55/63 (87.3%). Three knees were revised for aseptic loosening, 2 for deep infection, 1 for persistent stiffness, 1 unknown. Asymptomatic radiological loosening was noted in 4 patients. **Conclusion:** This is the largest series of primary TKA for under 40 year old patients with longest follow-up. We report good outcomes with over 87% survival at an average 17 year follow-up.

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PROCALCITONIN – THE ENIGMA IN PROSTHETIC JOINT INFECTIONS

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Introduction: The aim of the study is to evaluate the efficacy of using procalcitonin as an effective biomarker in prosthetic joint infections of the knee. Methods: This is a retrospective study using the total knee replacement registry at Singapore General Hospital. 29 patients with positive intra-op cultures were included in the study. Patients included 18 females and 11 males with a mean age of 69.5 years (range 41 to 92 years). 8 patients had gram negative cultures and 21 patients had gram positive cultures. Blood samples were obtained at presentation. Samples were tested for White Cell Count (WCC), Erythrocyte Sedimentation Rate (ESR), C-Reactive Protein (CRP) and Procalcitonin. Chi-square test was used to analyze categorical variables. Data analysis was performed using R (Version 3.22) [R core Team, 2015]. P-value <.05 was considered statistically significant. For post hoc analysis, Chi-square test was used and Bonferroni's correction was applied. Results : Of the 29 patients with culture positive prosthetic joint infection, only 12 had elevated procalcitonin levels (>0.5) at presentation. All 29 patients had elevated CRP and ESR levels. There is significant differences in the observed frequencies for normal or elevated biomarkers for infected TKA respectively when comparing between TW, Neut, CRP, Procal and ESR ($P < .001$). Conclusion : Study suggests that procalcitonin is not suitable biomarker for picking up prosthetic joint infections at presentation compared to more established biomarkers such as CRP and ESR.

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Abstract no.: 46334

**TWO-STAGE REVISION FOR INFECTED TOTAL KNEE ARTHROPLASTY:
BASED ON AUTOCLAVING THE FEMORAL COMPONENT AND
INTRAOPERATIVE MOLDING USING ANTIBIOTIC-IMPREGNATED
CEMENT ON THE TIBIAL SIDE**

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Purpose: The purpose of this study was to determine rates of infection control and postoperative function for new articulating metal-on-cement spacer. **Methods:** A retrospective study of 19 patients (20 cases) underwent 2-stage revision arthroplasty using mobile cement prosthesis were followed for a minimum of two years. This series consisted of 16 women and 3 man of overall mean age 71 years. During the first stage of revision, the femoral implant was removed, all adherent cement was removed, and then autoclaved and replaced. The tibial component was removed and a doughy state, antibiotic impregnated cement was inserted on the tibial side. To achieve joint congruency, intraoperative molding was performed by flexing and extending the knee joint. Each patient was evaluated clinically and radiologically. Clinical assessments included range of motion, and Hospital for Special Surgery(HSS) scores and Knee Society(KS) scores. **Results:** Mean range of knee joint motion was 70° prior to the first stage operation and 72° prior to second stage revision arthroplasty and 113° at a final follow-up following revision arthroplasty. The mean HSS, KS knee and function score were 86, 82 and 54 at final follow-up. The success rate in terms of infection eradication was 95% (19/20 knees). No patient experienced soft tissue contracture requiring a quadriceps snip. **Conclusion:** The novel technique provides excellent radiological and clinical outcomes. This technique offers a high area of antibiotic-impregnated cement and range of motion between first and second stage revision surgery for the treatment of chronic infection after TKA at reasonable cost.

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THE FIRST WORLDWIDE SURVEY ON SURGEON PREFERENCES IN THE MANAGEMENT OF STIFFNESS FOLLOWING TOTAL KNEE ARTHROPLASTY. A SURVEY OF SICOT MEMBERS.

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Background: Stiffness following total knee arthroplasty (TKA) is a devastating complication. To date there are no clear guidelines for the appropriate management of this problem. This survey was undertaken to understand the attitudes and preferences, amongst surgeons across the world, for the management of stiffness following TKA. **Methods:** A validated online questionnaire, looking into various aspects of management of stiffness following TKA, was sent to members of the International Society of Orthopaedic Surgery & Traumatology (SICOT), following approval of the SICOT Research Academy. A total of 311 respondents, from 25 countries in 6 continents, completed the online survey. **Results:** A majority of the respondents (54%) elected to perform manipulation under anaesthesia (MUA) between 6 and 12 weeks following the index TKA. The average improvement in range of motion (ROM) following MUA was perceived to be 10-20 degrees by 33% and 21-30 degrees by 42% of respondents. 72% of surgeons used a continuous passive motion (CPM) devise. A total of 95% of surgeons offered formal physiotherapy following MUA: 61% for 6 weeks, 28% for 3 months and 6% for 6 months. The rate of complication following MUA was reported to be <1% by 70% and 1-3% by 19% of respondents. **Conclusion:** Even though there is a variation in the management of stiffness following TKA, MUA and physiotherapy are still the first line of treatment along with CPM. Majority of the surgeons prefer to perform an MUA between 6 and 12 weeks following the index TKA.