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Abstract Book

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Abstract no.: 48755 FRACTURE BOTH BONE FOREARM IN ADULTS: MANAGEMENT BY NAILING COMPARED WITH PLATING

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Out of 500 cases of nailing both bone fracture forearm in adults, we studied 200 cases and compared it with 110 cases of plating both bone fracture forearm in a retrospective study – to evaluate usefulness of nailing in day-to-day practice. Clinical, radiological, objective and subjective assessments were done. Earlier open nailing changed to closed nailing with availability of c-arm, has improved results, and in spite of anatomical alteration biological nailing has several advantages with less complications compared to plating. Nailing, a cheap option still has a role in third world countries with poor economic condition, while plating is gold standard.

Abstract no.: 48777 UPPER LIMB GUNSHOT INJURIES: THE CAPE TOWN EXPERIENCE Esmee ENGELMANN¹, Sithombo MAQUNGO², Stephen ROCHE², M HELD² ¹Groote Schuur Hospital, Amsterdam (NETHERLANDS), ²Groote Schuur Hospital, Cape Town (SOUTH AFRICA)

Background: Upper extremity gunshot fractures are generally treated conservatively or surgically using open reduction and internal fixation (ORIF), intramedullary nails (IM) or external fixators. However, there is no gold standard for the management of these complex, multi-fragmentary upper extremity fractures. Aim: To describe and identify the injury patterns, management, complications and associated risk factors for upper extremity gunshot fractures. Methods: Data of patients with upper extremity gunshot injuries that presented to a Level I Trauma Unit in Cape Town, South Africa was collected prospectively over a ten-month period from June 2014 to April 2015. Clinical notes and radiographs were reviewed retrospectively. Results: Fifty percent of patients had fractures, most were diaphyseal, multifragmentary and extra-articular. 30% Had neurovascular injuries and 75% were associated with non-orthopaedic injuries. Fractures were treated conservatively in more than half of the cases; when surgically treated ORIF was most common, followed by intramedullary nailing and external fixation. Median fracture length was 5.5 centimetres. A longer fracture zone was statistically associated with surgical treatment (p<0.01). Median hospital stay was 6 days; infection and injury severity prolonged hospital stay (p<0.01). Five patients had ten re-operations; two were unplanned due to sepsis. Six cases of secondary infections were seen in 51 patients without identifiable. Discussion: In contrast to studies from the USA and Europe, most fractures were managed conservatively. Most fractures were diaphyseal and multifragmented, one third had neurovascular injuries and the majority had other additional injuries. Hospital stay was prolonged by infection and a higher injury severity score.

Abstract no.: 48800 SCAPULA FRACTURES: PLANNING OSTEOSYNTHESIS USING 3D PRINTED ANATOMICAL MODELS

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Background: Scapula fractures are challenging to treat surgically. Bony anatomy, uncommonly used approaches, implant limitations and morphological variance of fracture patterns may lead to difficulty achieving favorable outcomes. Three-dimensional (3D) models can help with a better understanding of fracture patterns and reduction maneuvers required to achieve anatomical congruence. Our hypothesis is that preoperative planning of acromion fracture fixation by means of a tactile and visual 3D experience is beneficial. Methodology: Patients sustaining scapula fractures following blunt trauma presenting to a tertiary academic hospital from 2012 to 2016 were identified (n=41). Computed tomogram (CT) scans of acromion fractures (n=15) were converted to real size 3D models using Materialise Mimics. Three categories of fit between plate and model interface were used as a grading system. A quantitative fit analysis of available implants on the reconstructed 3D models was done. Two separate assessments of each acromion were performed by five different observers. Results: An inter-observer Intraclass Correlation Coefficient (ICC) of 0,95 was obtained. Clavicle plates had the best overall anatomical fit (n=13, 86.7%). The 6-hole anterior clavicle plate had the highest (23.2) cumulative grading. The 3D models were adequate and anatomically representative in all fractures (n=15, 100%). Minor debridement around the fracture site to obtain anatomic reduction was needed (n=6. 40%). Conclusion: Clavicle plates are superior for acromion fracture osteosynthesis. There is a need for a more anatomical and versatile plating system. Simulating fracture fixation using 3D models is a good preoperative planning tool.

Abstract no.: 48783 AUGMENTATION PLATE FIXATION AND BONE AUTOGRAFTING IN HUMERAL NONUNION WITH CORTICAL THINNING AFTER INTRAMEDULLARY NAILING

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Background: Intramedullary nailing is safe and efficient choice of surgery in humeral fractures, but nonunions is quite often till nowadays. Osteoporosis with cortical thinning makes the salvage procedure more difficult and often lead to fixation failure. Materials & Methods: We retrospectively analyzed 14 patients with humeral nonunion whith cortical thinning after anterograde intramedullary nailing underwent augmentation plate fixation (with nail in situ) and bone autografting between Nov 2010 and Feb 2015. Lateral or antero-lateral approach and 3,5 mm locked-compression plate was utilized in all cases. In 10 cases addition interfragmentary lag screw or wire serclage were used. Proximal tibia bone grafting was performed in all 14 patients. Outcomes analyzed were: nonunion rate, reoperations. The mean term of final outcome assessment was $4,2\pm1,8$ years (2-7 yrs). Results: 12 of 14 pseudoarthrosis were united. Secondary surgeries – 2\14 (14,2%) - included plate exchange and repeated bone autografting. Conclusion: Augmentation plate fixation plate fixation and bone autografting in humeral nonunion with cortical thinning after intramedullary nailing is reliable procedure with quite high union rate.

Abstract no.: 48745 CLINICAL OUTCOMES IN MANAGEMENT OF UNSTABLE DISTAL RADIUS FRACTURES TREATED WITH EXTERNAL FIXATION AND INTERNAL FIXATION - A PROSPECTIVE COMPARATIVE STUDY Manish Kumar SHARMA¹, Sunil Kumar DASH¹, Sanket MISHRA¹, Aurobinda DAS¹, Deepankar SATHAPATHY², Syed Shahruq AHMED¹, Anmol Shiv ARORA¹ ¹Hi Tech Medical College, Bhubaneshwar (INDIA), ²IMS SUM, Bhubaneshwar (INDIA)

Background: Management of Distal Radius fracture that are inherently unstable is still a matter of debate. There is no conclusive evidence that support one surgical fixation method over another. An analysis patients treated with ExFix and Internal-Fixation for unstable distal radius fractures and evaluate the clinical efficacy of Exfix using principles of ligamentotaxis and Internal-fixation and compare functional recovery, fracture healing time and complications. Method: A prospective trial was undertaken at our hospital with 35 patients, all aged >20 yrs with closed distal radius fracture and divided into two groups: group I (Exfix- with or without percutaneous k wire, and JESS) and group II (Int-Fixation) including 14 and 21 patients, respectively. Periodic clinical examination and x-ray review was carried out to find out fracture union, and functional assessment. Patients were followed up for 1 year,6 months average.Results: Exfix consumed significant less operative time, fluoroscopic exposure, reduced hospital stay and guicker post-operative pain relief. Quick DASH score were significantly high in elderly treated with ExFix in comparison to young in which DASH score was higher with internal-fixator. Functional recovery was early with int-fixation but post-operative wrist stiffness was also higher. 2 cases of delayed wound healing &1 case of pin track infection with exfix application was observed.Conclusion: Internal-fixation remains the treatment of choice for unstable distal radius fracture involving the articular surface and in the young, while ext fixation can be considered as a primary treatment modality in the extraarticular fractures in young or even intraarticular fractures in the elderly.

Abstract no.: 48792 THE MANAGEMENT OF ADULT OLECRANON FRACTURES

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Introduction: There is variation in practice when dealing with adult olecranon fractures. We aimed to assess the literature to understand best practice and evaluate our practice of managing these fractures. Methods: In addition to a literature search we performed analysis of a retrospective case series of management of adult olecranon fractures at a large district general hospital over a 15 month period. We analysed fracture patterns, patient demographics, complications and outcomes. Results: 37 patients were identified from our case series. 6 were managed non-operatively, 10 with tension band wire, 10 with locking plate and 1 with intramedullary screw fixation. Elderly low-demand patients had high complication rates when treated operatively. The literature suggested these patients can successfully be treated non-operatively (Gallucci 2014). Conclusion: Our findings are in agreement with published literature and have influenced departmental practice, with increased consideration being given to whether these fractures can be managed non-operatively (but on a case-by-case basis).

Abstract no.: 48709 LOCKING PLATE FIXATION OF COMMINUTED OLECRANON FRACTURES

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Introduction: The predominant method of surgical management of olecranon fractures using tension band wiring (TBW) gives inadequate stabilization and compression of the comminuted fragments and is associated with higher implant related complications. We have evaluated the outcome using a novel technique using pre- contoured locking compression plate (LCP) for fixation of comminuted, displaced olecranon fractures. METHODS: 20 adult patients were treated with internal fixation of the olecranon fracture using pre- contoured LCP. 11 were males and 9 were females, with a mean age of 42.5 years. According to the Mayo clinic classification, 13 were Type II and 7 were Type III fractures. The functional results at the end of one year was judged using Mayo Elbow Performance Index (MEPI). RESULTS: 19(95%) fractures united with an average consolidation time of 12 weeks (10-20 weeks) and 1(5%) went into non union. The mean MEPI score was 85. Mean pronation-supination arc was 147 degrees (110 to 160 degrees). Mean flexion-extension arc was 126 degrees (100 to 140 degrees). Patients had a mean flexion contracture of 10.5 degrees. 2(10%) patients had post operative infection. We encountered implant prominence and resulting pain and discomfort among 2(10%) patients. Both patients underwent implant removal, one following union of the fracture and the other prior to fracture union. CONCLUSION: Our study, found favourable results in majority of the patients which is comparable to outcomes of other studies using similar technique and device, in the literature. Hence, plate fixation is an effective treatment option for displaced olecranon fractures.

Abstract no.: 48398 INTRAMEDULLARY NAILING IN THE TREATMENT OF HUMERAL SHAFT FRACTURES: IS THE DISTAL INTERLOCKING NECESSARY? Romain COLOMBI, Pierre MARTZ, Adrien BEVAND, Ludovic LABATTUT, Brice VIARD, Emmanuel BAULOT Dijon University Hospital, Department of Orthopaedic Surgery, DIJON (FRANCE)

Background: The gold standard for intramedullary nailing (IMN) in humeral shaft fractures treatment is the bipolar interlocking. The distal interlocking for IMN increase several morbid parameters: surgical time, fluoroscopy time, number of incisions and neurovascular risks. But there is no study comparing IMN with or without distal interlocking in the treatment of humeral shaft fractures. Our study's goal is to show that isolate proximal interlocking means no significant differences with bipolar interlocking for consolidation and clinical results. Methods: A continuous and comparing retrospective study was performed in our department. 121 consecutive patients from 2009 to 2016 with acute humeral shaft fracture treated with antegrade IMN, were retrospectively studied. The 6-month fracture union was the primary outcome. The second one was final clinical outcome, at minimum 6month follow-up, using usual scores for shoulder (Constant, Subjective Shoulder Value) and elbow (Mayo Elbow Performance Score, Subjective Elbow Value). Other parameters were analysed: Pain evaluation with Visual Analogic Scale (VAS), operating and radiation time. Results: Both two groups were not significantly different for population, fractures, or immobilization duration. No significant difference was found for bone union (p=0.51). shoulder functional outcomes, elbow functional outcomes or pain with VAS. Nevertheless, there were significant differences for operating time (p<0.01) and fluoroscopy time (p<0.01) during the surgery. Conclusion: This study showed that isolate proximal interlocking for humeral shaft fractures means no significant differences with bipolar interlocking for consolidation and clinical results, while avoiding additional operating and fluoroscopy time and risks linked to distal approaches.

Abstract no.: 46194 EVALUATION OF OPEN REDUCTION AND INTERNAL FIXATION OF PROXIMAL HUMERAL FRACTURES USING A LOCKING PLATE WITH SMOOTH PEGS - A RETROSPECTIVE STUDY Frida HANSSON. Anders EKELUND

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Optimal surgical treatment of displaced proximal humeral fractures is controversal. Open reduction and internal fixation using locking plates are commonly used, but have shown a high rate of complications. This retrospective study aim to identify complications and clinical outcome using a locking plate with smooth PEGs instead of screws (S3 Plate) Method: 82 patients with displaced proximal humeral fracture classified with 2-4 fragments (Neer Classification) treated with ORIF with S3 plate were studied retrospectively. Clinical outcome according to Constant Score, Single Shoulder Value (SSV), Disabilities of Arm Shoulder and Hand (DASH) and European Quality of life - 5 dimensions (EQ5D) and complication rate defined radiologically including PEG penetration, avascular necrosis and loss of reduction was assessed minimum 2 years after surgery. Results: The overall complication rate was 28% (n=23) and a reoperation rate 19,5% (n=16). A total of 11 PEG penetrations were identified (13,6%). Avascular necrosis was seen in 8,5% (n=7). 1 (1,2%) case with primary loss of reduction was identified. Mean constant score at follow up was 64,4 with a relative Constant score of 87% (SD:18%) compared to the contralateral uninjured side. The mean DASH score was 12,7, and mean EQ5D score 0,83. Single Shoulder Value (SSV) showed a mean value of 78,3. No cases of deep infection were seen. Conclusions: Fixation with S3 plate shows a proper osteosynthesis in displaced proximal fractures and the functional outcome is good. Symtomatic PEG penetrations are rare and the incidence is lower compared to what has been reported with locked screws.

Abstract no.: 47899 THE USE OF PRE-CONTOURED ANATOMICAL LOCKING PLATE IN THE MANAGEMENT OF DISPLACED MIDSHAFT CLAVICLE FRACTURES

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Introduction: Traditionally, clavicle fractures have been treated conservatively. However, conservative treatment is associated with known complications (nearly 15%) such as displacement, mal-union and non-union resulting in unsatisfactory outcomes. Therefore, early fixation and mobilization, particularly in the young, is recommended for early functional recovery. We present a study involving patients, with displaced clavicle mid shaft fractures, treated with pre-contoured plates. Methods: Fifty consecutive patients with displaced midshaft clavicle fracture were treated with open reduction internal fixation using pre-contoured anatomical locking compression plate. The clinical outcomes were evaluated, every 4 weeks following the injury until 6 months of post-operative period, using the Constant & Murley pain scoring technique and guick DASH technique. Results: There was significant improvement in Constant & Murray pain scoring at 24 weeks. Quick DASH scoring system showed statistically significant improvement in the outcome following surgery. The mean quick DASH score dropped from 83.27 at end of 4 weeks to 9.64 at end of 24 weeks with p value <0. 001. Conclusion: Open reduction and internal fixation of displaced clavicle mid shaft fracture is an attractive option in terms of pain relief and early mobilization.

Abstract no.: 47469 MANAGEMENT OF MIDSHAFT CLAVICULAR FRACTURES: COMPARISON BETWEEN NONOPERATIVE TREATMENT AND OPERATIVE IN 60 PATIENTS

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Introduction: Clavicle fracture is one of the common traumatic injury. Both nonoperative and surgical methods have been described for the management of this injury.A prospective study was undertaken to compare nonoperative and internal plate fixation in terms of functional outcome, the rate of nonunion, malunion and local complications in midshaft clavicular fractures. Materials and Methods: Patients with displaced midshaft clavicle fractures (Robinson type 2B) in age group of 20-50 years were recruited and randomly allocated into two groups, consisting 30 patients each. Group 1 patients were managed conservatively, with a figure-of-eight bandage whereas patients of group 2 were treated surgically by plate fixation. Followup was done at 6 weeks, 3, 6 months using patient's subjective evaluation, constant shoulder score, radiographic assessment and other complications. Results: In Group 1, 28 patients had fracture union and 2 nonunion, mean time for union was 11.29 weeks. In group 2, mean time for union was 9.27 weeks. Subjective outcome was inferior in group 1. Constant shoulder score was significantly lower in group 1 by 7.9 points at 6, 12 weeks followup and by 4.4 points at 6 months as compared to group 2. There were 6 malunions with cosmetic deformity. 2 nonunions and 1 patient with restriction of shoulder movements in group 1. In group 2,1patient had malunion, 3 had surgical scar and 2 with hardware prominence. Conclusion: Open reduction and plating gave superior results as compared to conservative management in displaced midshaft clavicle fractures in terms of union and function.

Abstract no.: 47510 MASON TYPE II RADIAL HEAD FRACTURES: IS FIXATION JUSTIFIED Christopher O'DOWD-BOOTH¹, John PETERS²

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Radial head fractures are common, with an associated morbidity and loss of function. The management of Mason Type II fractures however is controversial, do the risks of surgery justify the outcomes. There is an ongoing financial burden on healthcare, and hence we need to consider whether operative management in these fractures is justified. Evidence has shown closed reduction and immobilisation, resection, or open reduction and internal fixation all options for management. Studies have shown that with correct closed reduction and immobilisation techniques, followed by active mobilisation, excellent results can be achieved. Recent studies, along with developments in surgical technologies, have focused on fixation, with good results but lacking long term follow-up. Patients who are managed surgically and followed up in a number of large follow-up studies have shown up to a 44% complication rate with operative management, and no significant benefit to those treated conservatively. Recent evidence suggests superior results to be achieved following operative management when compared with conservative management of simple Type II fractures in the short, however this has yet to yield long-term outcomes. Conclusions: The management of Mason Type II fractures is controversial, with the majority of studies opting towards operative treatment. However, long term follow-up fails to suggest a clinically significant difference compared to non-operative management. This leads to the concern that the risks associated with internal fixation is not born out in the outcomes. Overtreatment of these injuries poses an increased cost to trusts and patient's.

Abstract no.: 47122 A COMPARISON OF NON-OPERATIVE VERSUS OPERATIVE FIXATION OF HUMERAL SHAFT FRACTURES – A FIVE YEAR EXPERIENCE AT ONE TRAUMA CENTRE

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Introduction: Humeral shaft fractures are common and traditionally managed nonoperatively. However with development of fixation techniques and the potential benefit of quicker return to function some surgeons advocate early fixation. The aim of this study was to analyse the union rate, union time and complications associated with both a nonoperative and operative approach. Methods: A retrospective review of all humeral shaft fractures presenting to a level one trauma centre between 1st February 2011 and 1st February 2016 was performed. Patient demographics, splinting used, union rate, complications and outpatient resources used were recorded. Results: During the study period 41 patients were treated at our centre; 23 non-operatively and 18 surgically. Those treated surgically were younger (40 versus 54 years), had slightly higher union rates (88%) versus 83%) and quicker time to union (8 versus 13 weeks). In the non-operative group 74% were treated using a humeral brace, one required delayed fixation and two patients had an associated radial nerve palsy that recovered. The mean residual deformity was 14 degrees in the coronal and 7 degrees in the sagittal plane. Conclusion: Humeral shaft fractures were successfully managed using both modalities at our centre. Plate fixation led to higher union rates and faster union, however any potential benefit must be weighed against risks of surgery.

Abstract no.: 46542 COMPARISON BETWEEN RADIAL HEAD EXCISION VERSUS RADIAL HEAD REPLACEMENT BASED ON MAYO ELBOW SCORING IN COMMINUTED RADIAL HEAD FRACTURES

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Introduction: Comparison between radial head excision versus radial head replacement based on mayo elbow scoring in comminuted radial head fractures. Methods: This is comparative prospective study comprising 32 patients between age 22 - 60 years with comminuted radial head fractures. They were randomized placing 17 patients in the excision group and 15 patients in the arthroplasty group. The patients were followed up for a period of 18-24 months postoperatively. Results were analysed by the Mayo's elbow performance score at 6 months and 18 months and were statistically evaluated by Chisquare test and Fisher's test. Results: As per Mayo's score at 6 months follow up, results in excision group were graded as excellent, good, fair, and poor in 2, 5, 7 and 3 cases respectively as compared to 5, 6, 2 and 2 cases respectively in arthroplasty group. Mayo's score at 18 months follow up in excision group were graded as excellent, good, fair, and poor in 2, 6, 6 and 3 cases respectively as compared to 7, 4, 2, and 2 cases respectively in arthroplasty group. The difference between the results was statistically significant for Chi- square test and Fisher's test. Moderate and severe pain occurred in 3 cases (17.6%) of excision and 1 case (6.7%) of arthroplasty group had moderate pain. There was severe elbow stiffness in 2 cases of excision. Conclusion: Our study shows that long and shortterm results of radial head arthroplasty is better as compared to excision in comminuted radial head fractures based on mayo elbow scoring.

Abstract no.: 47282 JOINT-PRESERVING REGENERATIVE THERAPY USING CONTROLLED RELEASE OF RHFGF-2 FOR PATIENTS WITH OSTEONECROSIS OF THE FEMORAL HEAD

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Background: For many years, joint-preserving regenerative therapy has been desired for osteonecrosis of the femoral head (ONFH). The purpose of this study was to evaluate the safety and clinical outcomes of regenerative therapy using controlled release of recombinant human fibroblast factor (rhFGF)-2-impregnated gelatin hydrogel for the precollapse stage of ONFH. Methods: Ten patients with femoral heads up to precollapse stage 2 underwent a single local administration of 800-ug rhFGF-2-impregnated gelatin hydrogel and followed up for 3 year. Primary outcomes included adverse events and complications. Secondary outcomes included changes in Harris Hip Scores, VAS pain scores, and UCLA activity scores, radiological changes as determined via radiographs, CT scans, and MRI of the hip joint. Results: All Adverse events were recovered without problem. The surgery was performed with a minimally invasive technique based core decompression (1 cm of skin incision), and walking was allowed from the day after surgery. Mean clinical scores improved significantly after three year compared with before surgery. There was only one case of femoral head collapse, and it had the greatest necrosis volume fraction. The other nine cases did not involve ONFH stage progression, and collapse was prevented. CT images and recent MRI 3 year postoperatively confirmed bone regeneration and reduction of the necrotic area. Conclusions: We reported the first clinical application, good short-term clinical results, and safety of rhFGF-2 -impregnated gelatin hydrogel for patients with precollapse stage of ONFH. Clinical application of rhFGF-2-impregnated gelatin hydrogel for patients with precollapse stage of ONFH was feasible and safe.

Abstract no.: 47360 HEALING PROCESS OF OSTEONECROTIC LESIONS OF THE FEMORAL HEAD FOLLOWING TRANSTROCHANTERIC ROTATIONAL OSTEOTOMY: A COMPUTED TOMOGRAPHY-BASED STUDY Won Yong SHON, Devendra LAKHOTIA, Chirayu DWIVEDI Department of Orthopedic Surgery, Korea University Guro Hospital, Korea University College of Medicine, Seoul (SOUTH KOREA)

This study aimed to evaluate the healing process of previously transposed necrotic lesion after a TRO for nontraumatic osteonecrosis of the femoral head using computed tomography (CT). Among 52 patients (58 hips) who had preserved original femoral head after TRO, we retrospectively reviewed 27 patients (28 hips) who had undergone sequential CT scans and had no major complication following TRO. The average age was 34 years (range, 18 to 59 years). The mean follow-up period was 9.1 years. CT scans of the osteonecrotic lesions showed cystic changes with heterogeneous sclerosis in 13 hips (46%), normal trabecular bone with or without small cysts in 9 hips (32%), and fragmentation of the necrotic lesion in 6 hips (22%). The collapse of the transposed osteonecrotic area on the CT scan was significantly associated with the healing pattern (p = 0.009. Furthermore, a significant association was found between the collapse of the transposed osteonecrotic area on the CT scan of 17 hips (60%) and postoperative Harris hip score (p = 0.021). We observed no differences among the healing patterns on CT scans with regard to age, gender, etiology, staging, preoperative lesion type, preoperative intact area, percentage of necrotic area, direction of rotation and immediate postoperative intact area. The majority of the hips showed incomplete regeneration of the transposed osteonecrotic lesion with cysts, sclerosis, and fragmentation, whereas repair with normal trabecular bone was observed only in one-third of the hips that were preserved after Sugioka TRO.

Abstract no.: 47576

PERIACETABULAR QUADRUPLE OSTEOTOMY OF PELVIS IN ELDER CHILDREN: CT SCAN ANALYSIS OF ACETABULAR RETROVERSION AND ANTERIOR OVER COVERAGE OF THE HIP, PREVENTING FEMORAL ACETABULAR IMPINGEMENT

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Periacetabular quadruple osteotomy of pelvis (QOP), with osteotomy of ischial spine to release sacrospinal ligament, is reserved to elder children with low remodeling potential. Different parameters were studied with CT-Scan before (pre-OH) and after surgery (post-OH) and for non-operated hip (NOH). The study determined the good manner to avoid retroversion and excessive anterior coverage. 15 QOP performed in 13 patients, 10 to 15 years-old. Morphology of pelvis analyzed with CT scan preoperatively and 2 years after. Pathologies were legg-calve-perthes (7 hips) and dysplasia (8 hips). Acetabular index, coverage and version of the acetabulum were measured by 2D exam. Frontal lateral inclinations of the lips and sagittal anterior acetabular inclination were measured by 3D images. Mean anterior acetabular index 50.4° (NOH), 56° (pre-OH), 58.7° (post-OH). Posterior acetabular index 48.5° (NOH), 52.2° (pre-OH), 40° (post-OH). Anterior coverage angle 37.1° in (pre-OH), 27.6° (post-OH), 30.1° (NOH). Posterior coverage: 20.4° (pre-OH), 17.2° (post-OH), 12.4° (NOH). acetabular version 2.1° (pre-OH), 8.3° (post-OH), 2.5° (NOH). Antero-lateral lip inclination: 50.3° (pre-OH), 35.3° (post-OH), 43.8° (NOH). Postero-lateral lip inclination: 56.7° (pre-OH), 43.7° (post-OH), 55.8° (NOH). Anterior acetabular inclination: 21.3° (pre-OH), 15.6° (post-OH), 18° (NOH). QOP allowed important range of coverage of the hip in adolescent. External rotation related to figure-offour should be omitted, whereas the good maneuver by lying the acetabular fragment below the iliac bone, with lateral inclination in frontal plane as a steering wheel movement, preserves comparable morphology of OH with NOH and avoids retroversion and excessive anterior coverage responsible of pain and early osteoarthritis.

Abstract no.: 46869 HOSPITAL PREFERENCES FOR HIP FRACTURE PROCEDURE TYPE AND RATES OF BLOOD TRANSFUSION: IS THERE A RELATIONSHIP? James Patterson WADDELL¹, Josian PETGRAVE², Vanessa WILLSON², Erik HELLSTEN² ¹University of Toronto, TORONTO (CANADA), ²Health Quality Ontario, Toronto (CANADA)

Purpose: This study aims to identify factors that contribute towards institutional variations in transfusion rates for hip fracture surgery across Ontario. Methods: We investigated associations between patients' type of fracture, type of surgery and rate of blood transfusion. Results: There were 36,110 patients discharged from Ontario hospitals that underwent surgical fixation for a diagnosis of hip fracture. Of these, 10, 827 received a transfusion of blood products. At a patient level, transfusion rates varied by both type of surgery and type of fracture. 48 % of cases involving use of intramedullary nails reported a transfusion, compared with 30% involving sliding hip screws and 24% involving arthroplasty. These sets of patient characteristics are not independent predictors of transfusion: subtrochanteric fractures are also more likely to receive nails, and hence receive transfusions, while femoral neck fractures are more likely to undergo arthroplasty, and hence less likely to be transfused. We found wide variation in the proportion of nails versus screws used for pertrochanteric fractures, ranging across hospitals from 90% screws and 4% nails to 7% screws and 86% nails at the other. Conclusion: Our findings suggest that the variation in the proportion of nails versus screws across the pertrochanteric fracture is a key factor driving transfusion rates.

Abstract no.: 48171 ILIZAROV HIP RECONSTRUCTION OR PELVIC SUPPORT OSTEOTOMY FOR TREATMENT INSTABILITY OF HIP

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INTRODUCTION: Ilizarov hip reconstruction or Pelvic support osteotomy (PSO) remains to be one of indicated surgical procedure to improve function of hip and gait. METHODS: Since 1990, 35 patients with unilateral instability of the hip underwent Ilizarov PSO procedure. The age ranged from 6 to 40. Cause of femur instability was CDH 12; defect of femoral head, nonunion/defect of the neck of the femur 23. Mono level abductive osteotomy was performed in 9: double level (abductive in proximal part with varizational in diaphyseal part osteotomy) was done in 26. All patients were reviewed clinically at a followup time from 1 to 15 years. RESULTS: Leg length discrepancy and mechanical alignment was reestablished in all cases. Complete improvement of Trendelenburg's sign was achieved in 30; Improvement of ROM, lumbar lordosis and gaits was achieved in 25 patients. All patients (35), who had pain syndrome before treatment mentioned improvement in short-term follow-up, but 8 (mostly age 35 and up), complained of pain in later period. Outcome were evaluated clinically by Harris hip scoring system. CONCLUSION: PSO presents valuable solution for treatment of instability of hip. Results of surgery should be estimated after extensive physical therapy directed for improvement of abductor function and resetting gait reflexes. Patients should be well informed that procedure is not restoring anatomy of hip, and in future THR must be taken into consideration, which might conduct certain technical difficulties. The Ilizarov hip reconstruction osteotomy can successfully correct a Trendelenburg gait by stabilizing the hip and supporting the pelvis.

Abstract no.: 48836 SHORT TERM RESULTS OF DIGASTERIC OSTEOTOMY AND PROXIMAL FEMORAL SHORTENING TECHNIQUE FOR TOTAL HIP ARTHROPLASTY IN ADULT PATIENTS WITH DEVELOPMENTAL DYSPLASIA OF THE HIP CROWE TYPE 4 Afshin TAHERIAZAM

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Introduction: Total hip arthroplasty (THA) for deficient acetabulum in patients with Developmental Dysplasia of the Hip (DDH) is technically demanding and challenging. In This study, we investigated the short-term outcomes of THA in patients with Crowe type IV DDH by digasteric osteotomy and proximal femoral shortening technique. Materials and methods: This is a cross-sectional prospective study. We identified 90 dysplastic hips Crowe type IV in 87 patients (72 females, 18 males; mean age 46.3±5.2 years; range29.1to 57.6years) with DDH undergoing primary THA between 2009, and 2014. For Crowe type IV, proximal femoral shortening using digastric trochanteric osteotomy was performed followed by trochanteric wiring. Clinical assessment was performed using Harris hip scores (HHS) and Limb length discrepancy (LLD) preoperatively and at the last clinic visit, while radiological assessment was done according to serial radiographic findings. Results: The mean follow-up was 2.6±1.7years (Range1.9-5.2). The mean HHS was 86±7(Range77-97) at the last visit. Limb length discrepancy (LLD) decreased significantly from 6.6±2.5 cm to 1.1±1 cm (p<0.001). Peroneal nerve palsy developed in one patient resolved after 4 months. Dislocation occurred in one patient due to falling. Loosening or radiolucencyand infection were not seen in our patients.we hadn,t any case with trochanteric nonunion and wiring failure. Conclusion: Our results support THA as a successful surgical option in the management of Crowe type IV DDH and improving pain relief and functional status. Proximal femoral shortening with digastric osteotomy is helpful in Crowe IV DDH to decrease the LLD and a successful method for shortening.

Abstract no.: 47275 PREDICTOR VARIABLES IN ACETABULAR FRACTURES. OUR EXPERIENCE IN 111 CONSECUTIVE PATIENTS Gonzalo LUENGO ALONSO¹, Elena VACAS SANCHEZ¹, Jose Luis LEON

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Introduction: Acetabular fractures increase posttraumatic arthritis risk and thus total hip arthroplasty (THA) incidence. Objectives: Analyze and compare predictor variables that increase the risk of THA, to those already reported. We also studied long-term clinical and functional outcomes of THA after acetabular fractures treated with surgical fixation .Material: We retrospectively study a cohort of 207 consecutive patients who suffered from acetabular fractures were treated at our center from 2002/2014. 128 were treated surgically, with a minimum follow-up of 3 years. Acetabular fracture pattern was classified according to Judet-Letorunel and AO Classification. We studied variables in Matta's nomogram, among others. Results: Mean aged was 40.53 yo (range 16-83). Twenty developed osteoarthritis requiring THA, four were lost to follow-up, leaving fifteen patients finally. We found significate statistically relationship related to THA after acetabular fractures in: femoral dislocation (P<0.01), seagull sign (P<0.01) and femoral head cartilage lesion (P<0.01). No relationship was found in acetabular impaction marginal (P<0.095), posterior wall involvement (P<0.092), surgical approach (P<0.9) nor sex (P<0.501), among others. THA was performed in 9.5 years after ORIF on average. Harris hip score after THA had a mean difference of 47.92 points (7-70). Complications were higher than reported in literature. Conclusions: Our experience is like others, so predictors could help us to distinguishing which patients should keep a closer surveillance. Functional and clinical outcomes of these patients after THA are really good. Complications after conversion THA after previous fracture fixation are, predictably, higher than cases of primary THA, so they need closer follow-up.

Abstract no.: 48731

VALIDITY OF SELECTED PATIENT-REPORTED OUTCOMES MEASUREMENT INFORMATION SYSTEM (PROMIS) MEASURES IN PATIENTS WITH LEGG-CALVé-PERTHES DISEASE

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Purpose: To evaluate the validity of seven PROMIS measures to assess HRQoL relevant to pediatric patients with LCPD. Methods: This was a multicenter prospective study (13 institutions) of patients with Perthes disease (age 8 to 18 years) who had non-surgical or surgical treatments > 6 months prior. Waldenström disease stages were categorized early: (IB&IIA), late (IIB-IIIB), or healed (IV). Seven PROMIS measures included Mobility, Peer relationships, Pain interference, Fatigue, Anger, Anxiety, and Depression. Convergent validity was assessed between PROMIS measures. Construct validity was examined by using the know-group method to compare across 3 groups (surgical vs. non-surgical and ages). The standardized score of 50 was set as the population average and minimally important difference was 2-3 points. Results: 184 patients (early: 23, late: 63, healed: 98) were enrolled and analyzed. Pain, Fatigue, Anxiety and Depression measures correlated moderately to strongly (r's ≥0.53). Mobility was also moderately correlated with Pain, Fatigue, Anxiety, Depression and Anger (r's -0.39 to -0.49). All seven measures were worst in the early stage. Mobility was the best in the healed (48) followed by the late (45) and the early (40) stages. In the early stage, surgical patients reported worse Mobility but better Pain, Fatigue, Peer relations, Anxiety and Depression. In the healed stage, these differences diminished. Among patients who were at the early stage, older patients reported worse mobility (r= - 0.51). Conclusion: These data provide preliminary evidence of validity of PROMIS to assess HRQoL in patients with LCPD.

Abstract no.: 46867 TRENDS AND VARIATIONS IN THE QUALITY OF HIP FRACTURE CARE IN ONTARIO HOSPITALS FROM 2011 TO 2015: EXAMINING RESULTS FROM A PROVINCIAL HOSPITAL SCORECARD James Patterson WADDELL¹, Josian PETGRAVE², Vanessa WILLSON², Erik HELLSTEN² ¹University of Toronto, TORONTO (CANADA), ²Health Quality Ontario, Toronto (CANADA)

Purpose: We investigate trends and variations in hip fracture outcomes and care processes across Ontario hospitals between 2011 and 2015. Methods: We examined patients discharged from Ontario hospitals with a hip fracture diagnosis between fiscal years 2011 and 2015. Crude and risk-adjusted 30- and 90- day mortality (adjusted for patients' age, sex and comorbidities), 1-year re-fracture rates, median time to surgery and proportion of patients undergoing surgery within 48 hours. Results: Over the 5 year study period, the proportion of hip fracture patients receiving surgery within the 48 hour benchmark improved from 73.5 to 84.4%. Provincial mortality rates improved slightly: 30day mortality decreased from 7.6 to 7.1%, while 90-day mortality decreased from 13.5 to 12%. 1-year re-fracture rates remained stable between 3.4 and 3.6%. Among large hospitals with at least 100 annual hip fracture discharges, risk-adjusted 30-day mortality rates ranged from 2.8% to 13.5% and risk-adjusted 90-day mortality rates ranged from 6.5 to 19.4%. The proportion of patients receiving surgery within 48 hours ranged from 72.4 to 98.3. There was a weak hospital-level correlation between higher performance on the 48 hour surgery benchmark and lower 30-day mortality rates. Conclusion: The quality of hip fracture care in Ontario hospitals improved across several important dimensions between 2011 and 2015. However, there continue to be large and persistent variations in riskadjusted post-fracture mortality rates between hospitals. Future efforts should also focus on quality improvement in rehabilitation and post-acute care.

Abstract no.: 48161 PERIPROSTHETIC FEMUR FRACTURE FOLLOWING TREATMENT WITH CEPHALOMEDULLARY NAIL, A RETROSPECTIVE SINGLE CENTER EXPERIENCE

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Periporsthetic fracture following treatment of trochanteric fractures with cephalomedullary nails is a rare but very severe complication. Therefore, the aim of this study was to assess the impact of revision surgery and general health state on mortality and functional outcome. Between 2000 and 2015, 3549 patients with OTA/AO 31A1-3 femur fractures were admitted to our department and treated with a Gamma® nail or PFNA®. Out of this sample 42 patients suffered 43 periporsthetic fracture (1.2%). The mean follow-up of 26 ± 9.7 months. Fractures were classified according the AO classification and the modified Vancouver classification. Treatment options included ORIF, removing the cephaloedullary nail and fixation with a long nail with or without cercalge wires. General health status was defined by the ASA Score. Mortality, mobility, hospital stay and complications were assessed retrospectively. A total of 14.3% patients died within 90 days following surgery. At least 16.6% patients died due to medical complications strongly related to the surgery. The average time to fracture following initial surgery was 122.7 ±32 weeks. The most common fracture types were AO 32A1 (53.5%) and AO 32B1 (23.3) as well as Vancouver C and B1. Time to periporsthetic fracture less or longer than six months following surgery for trochanteric fracture and ASA Score had no significant influence on mortality, complications, duration of surgery and postoperative mobility. Periporsthetic fracture following cephalomedullary nails is a severe complication. It leads to prolonged hospital stay and delayed recovery. Hospital stay mortality rates up to 16.6% postoperative.

Abstract no.: 46886 ALIGNEMENT VIEW BEFORE TOTAL HIP ARTHROPLASTY IN DYSPLASTIC HIPS CAN FIND SOME CASES FOR DISTAL OSTEOTOMY WITH OUT SHORTENING BY NEW MECHANICAL AXIS AFTER INSERTING CUP AND STEM, AN IMPORTANT TECHNICAL POINT Dariush GOURAN SAVADKOOHI¹, Babak SIAVASHI² ¹Tehran University Of Medical Sciences, Sina Hospital, TEHERAN (IRAN), ²Tehran University Of Medical Sciences, Sina Hospital, Joint Reconstruction Research Center, Tehran (IRAN)

Total hip arthroplasty is done for destructive joint disorder sequela of dysplastic hips. There may be some cases which has valgus knee. So, we take alignment view before total hip arthroplasty in DDH cases. There were more valgus knees especially in crowe type 3 and 4 for maintaining mechanical axis balanced before operation. If it is not corrected during process of THA, after inserting cup and stem and omission of proximal femur, valgus alignment may become prominent. So it is advised that if there is high riding hip which need shorthening, it is done in distal part of femur to both correct mechanical axis and also do shortening. In crowe type 1 and 2 which may do not need shorthening, if there is valgus knee, distal osteotomy without shortening should be done. Between 2005 and 2015, there were 154 dysplastic hips which need THA. Alignment view were done for all of them. There were 6 cases of crowe type 1 and 2 that need distal osteotomy to correct knee alignment without any need of shortening. In pre operative planning, it is necessary to draw new mechanical axis of limb with new position of cup and stem to calculate position and size of osteotomy of distal femur. If osteotomy done without attention to new mechanical axis after inserting cup and stem, there may be over or under correction of alignment.

Abstract no.: 48813 A NEW NAVIGATION INSTRUMENT FOR CORRECT POSITIONING OF BOTH COMPONENTS WITHIN THE COMBINED SAFE-ZONE (SSAFE-ZONE) IN TOTAL HIP ARTHROPLASTY Karl-Heinz WIDMER

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Introduction: Complications due to suboptimal positioning of prosthetic components in total hip arthroplasty (THA) like dislocations, subluxations, edge loading, squeaking, elevated abrasive wear and reduced total joint longevity are still emerging issues. Correct component positioning reduces the risk for such complications and is of paramount importance in more active patients. This study reports on the rational of the combined safe-zone (cSafe-Zone) and on a new pair of surgical instruments to place both components within the cSafe-Zone. Methods: More than 900 minimal-invasive total hip arthroplasties have been performed using the direct anterior approach. Cups were implanted applying the "stem-first" surgical technique. The cSafe-Zone is derived from a 3D-model. Results were transferred onto a trial head which indicates the best relative orientation of cup and stem by marks on its surface. A modified cup impactor was used for cup alignment and impaction during trial reduction under full visual control. Results: A prosthesis-specific inverse linear relationship exists between stem antetorsion and cup anteversion. Larger prosthetic heads provide larger cSafe-Zones. allowing lower cup inclinations for higher jumping distance. Maximizing the cSafe-Zone leads to optimal target values for both component orientions. The new instruments provide an easy way to manipulate the socket into its optimal orientation. Components of patients operated on with the "stem-first" technique were placed within the cSafe-Zone in 94%. No squeaking or prosthetic impingement did occur. Conclusion: Stem-first technique using trial head is ideally suited for minimal-invasive DAA. Established surgical techniques are preserved. Full intraoperative control of component placement is provided.

Abstract no.: 47646 THE MALAWI NATIONAL JOINT REGISTRY: 10-YEAR OUTCOME OF JOINT REPLACEMENT IN A LOW-INCOME COUNTRY

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Introduction: The Malawi National Joint Registry (MNJR) is currently the only national joint registry (NJR) in Sub-Saharan Africa, and one of the only registries in the world in a lowincome country. The aim of this study is to report the 10-year follow-up and functional outcome of joint replacement in Malawi. Methods: All patients who had a total joint replacement between 2005, when the registry commenced, until 2015, were included in the study. Patients were identified from the Malawi National Joint Registry. Results: To date, 307 total hip replacements (THRs) and 177 total knee replacement (TKRs) have been entered into the registry: 22% of THRs and 2 % of the TKRs were in HIV-positive patients. A total of 86 patients (62 THR, 24 TKR) died or were lost to follow-up over a tenyear period. The primary indication for THR was avascular necrosis (n = 170) and osteoarthritis in patients who underwent TKR (n = 150). The mean post-operative Harris Hip Score at 10-year follow-up was 85 (range = 36 - 91) and the mean Oxford Knee Score was 45 (range = 29 - 48). In the HIV positive patients, there were no early (<6 weeks) or late complications (>6 weeks) and there was no difference in their functional outcome measures at final follow-up, compared to the HIV negative patients. Conclusion: This is the first and largest study of its type and demonstrates that it is safe to perform total joint replacements in a low-income setting.

Abstract no.: 47831 EFFECT OF A FAST RECOVERY PROGRAM ON BLOOD LOSS AND TRANSFUSION RATE IN UNCEMENTED THA USING EXIA T/PLASMAFIT COMPONENTS

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Introduction: Total hip arthroplasty (THA) is associated with substantial blood loss requiring allogenic blood transfusion in 10-25%. Minimally invasive approaches for THA and fast recovery protocols offer the potential advantage of decreased perioperative blood loss (BL). Methods: A retrospective study was performed including 429 consecutive patients undergoing THA. In all cases the uncemented Excia T stem and the Plasmafit cup (Aesculap, Tuttlingen, Germany) was used. 1) Fast recovery MIS group: 211 patients (124 females) with mean age 67 years (35-91). No drains were used. Preoperative TXA (10mg/kg) was administered. 2) Standard TG group: 218 patients (128 females) with mean age 66 years (29-94). A closed-suction drain were removed on 2nd postoperative day. TXA was not administered. Hemoglobin (Hb) was measured on pre-, 1st and 5th postoperative day. Results: The mean preoperative Hb in MIS group was 14.2 g/dl (SD 1.3) compared to 14.0 g/dl (SD 1.3) in TG group (p=0.082). The mean drop in Hb on 1st and 5th postoperative day comparing to preoperative Hb was significantly lower in MIS group with 2.4 g/dl (SD 0.8) and 3.6 g/dl (SD 1.1) compared to 3.4 g/dl (SD 1.1) and 4.5 g/dl (SD 1.3) in TG group (p<0.001). 5 patients (2.4%) received transfusions in MIS Group versus 51 patients (23.4%) in TG group (p<0.001). Conclusions: A fast recovery protocol showed significantly less blood loss on 1st (17% vs 24%) respectively 5th (25% vs 32%) postoperative day and significantly less blood transfusions (2,4% vs 23,4%) compared to the standard group.

Abstract no.: 48124 FOUR DECADES OF EXPERIENCE ON TWO-STAGE REIMPLANTATION OF INFECTED TOTAL HIP ARTHROPLASTIES AT THE HOSPITAL FOR SPECIAL SURGERY, NY, USA

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We report on our four decades of experience in the use of a 2-stage exchange in managing infected total hip arthroplasties at the Hospital for Special Surgery in New York City (1970 to 2016). This protocol involves resection arthroplasty, 6 weeks of intravenous antibiotics to obtain a minimum "postpeak" serum bactericidal titer (SBT) of 1:8 and reimplantation after the clinical evolution of the patient is satisfactory. Over the past 40 years, we have conducted and published several studies showing the effectiveness of this treatment. Since our previous report was published in 1994, prevalence of multidrugresistant (MDR) organisms has increased significantly as well as the complexity of the periprosthetic infections. In 2008, we set out to determine if 2-stage exchange remains an effective treatment for newer pathogens, many of which are MDR. We also included periprosthetic infections with severe bone loss, which previously were considered a contraindication. In our most recent experience the overall eradication rate was 95% (80/84 hips) after a minimum 2 year follow up. All 21 (25%) MDR pathogens implicated in the infected THAs were eradicated. We conclude that 2-stage exchange with a 6 weeks of intravenous antibiotics obtaining a minimum 1:8 SBT remains an effective treatment even when MDR bacteria are involved, including in hips with severe bone loss.

Abstract no.: 47718 ECONOMIC COST OF DISLOCATION IN THA IN FRANCE

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INTRODUCTION Dislocation is a major and costly complication in Total Hip Arthroplasty (THA). The purpose of this study was to assess the financial impact of a decreasing dislocation rate in FRANCE. MATERIAL and METHOD In order to measure the dislocation rate and to attempt to evaluate the substantial cost savings, we have used data from both the ATIH (the Technical Hospital Information Agency) and the PMSI (the French Nationwide Hospital Electronic database), as well as some scientific publications from J. CATON et al (2004), J. SANCHEZ-SOTELO et al (2005) and J. A. EPINETTE et al (2015). RESULTS In FRANCE, between 2004 and 2014, the dislocation rate decreased by 3% (from 9.1% to 6.1%) in spite of an increasing THA rate of 17.95%. If the dislocation rate had been identical in 2015 and in 2004, the total amount of cases would have been 12204 instead of 9712. The mean discounted hospital cost we identified for a dislocation case in 2016 was 3247€ per dislocation (including mean closed reductions and revisions for recurrent dislocations). The savings over 9 years were estimated at 77500000€ (77.5M€). CONCLUSION These substantial cost savings should probably be imputed to an increasing use of a new implant: the Dual Mobility Cup (DMC). The DMC has proven to provide positive results in THA. A dramatic decrease in dislocation rate has been observed, dropping from over 10% to less than 1%. A decrease of 1% in dislocation rate over one year will save an estimated 50M€ /y.

Abstract no.: 46944 DOES ACETABULAR COMPONENT POSITIONING IN THA WITH REFERENCE TO TRANSVERSE ACETABULAR LIGAMENT HELP? A CT BASED STUDY

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Background: Many studies have concluded that transverse acetabular ligament can be used to orient the acetabular component during total hip arthroplasty. Our Attempt is to determine whether TAL could be identified during primary THA in all patients' peroperatively and CT analysis of component post THA. Methods: Prospective series of 36 patients undergoing primary THA we attempted to identify the TAL and used it as a guide for orientation of the acetabular component. Component position evaluation was determined by CT measurements. Results: TAL identified with ease Grade 172.2% ; Grade 216.6% and further acetabular reaming was required in 11.11% patients. CT evaluation post operatively of the acetabular cup orientation revealed the component in safe zone as described by Lewinnek et al. in 32 patients (88.8%). Acetabular cup position was compared with native ante version in the opposite hip of the same person and found to be within 2 degrees of the operated hip. Conclusion(s): TAL could be routinely identified in majority of the patients who underwent primary total hip arthroplasty and could be used as a reference for acetabular component position. CT analysis confirms the component position to be within the safe zone and comparable to the native acetabular ante version. Implications: TAL can be used as a very good landmark for the positioning of the acetabular component in cases of primary THA. Conflict of Interest: None declared

Abstract no.: 47923 INSTABILITY IN THR - PREVENTION & MANAGEMENT Chetan SOOD Army Hospital (Research & Referral), Chandigarh (INDIA)

Most centres cluster between 2-5% ,1/3 require surgery after dislocation, Closed reduction cost – 10% of initial procedure. Open revision – mean cost 150%. Dislocation rate, Mayo clinic: 2.4% in >7000 primaries 4.8% in patients with previous hip operations.Factors influencing are implant factors, patient factors and surgeon factors and rehab. Preop Identify high risk patients. Adapt Mx choice accordingly to alter implant selection and approach, Pre-operative planning, Templating, Restoring hip biomechanics & soft tissue tension. Intraop approach, component position, stability testing and soft tissue releases. Post op conselling, rehab, safe care plan all act in conjunction to avoid a dislocation. Mnagement of instability will rest on evaluation and accurate diagnosis of the cause of instability.Impingement, soft tissue contractures, component positioning, abductor sleeve functionality, neuromuscular status, patient compliance and possibility of infection are paramount prior to planning a revision. Planning a revision after the possible cause is ascertained, info of the primary implant, compatibility and interchangeability with the available components need detailed consideration to reduce the grade of the surgery and optimal result. A full compliment of cup extraction instruments, ETO, distal fixation stems, cables, trochanteric plate, constrained liners, face chancing liners and compatible head taper options needs a detailed plan and arrangement. Salvage options of girdle stones procedure are best discussed with the patient beforehand.

Abstract no.: 46812 AFTER USE OF DUAL MOBILITY IN DISLOCATIONS CUPS CEMENTLESS PRIMARY TOTAL HIP **ARTHROPLASTY:** Α **PROSPECTIVE MULTICENTER SERIES IN KOREA** Kwang-Jun OH¹, Yeesuk KIM², Sangmin KIM³, Jihyo HWANG⁴ ¹KonKuk University Medical Center (SOUTH KOREA), ²Havang University Medical Center, Seoul (SOUTH KOREA), ³Seoul Medical Center, Seoul (SOUTH KOREA), ⁴Hanlivm University Medical Center, Seoul (SOUTH KOREA)

The purpose of this study was to investigate the incidence of dislocation, and risk factors associated with dislocation after total hip arthroplasty using a dual mobility cup. The arthroplasties involved 167 hips in 165 patients; 51 hips (30.5%) were in male patients and 116 (69.4%) in female patients. The active articulation E1® dual mobility cup (Biomet, Warsaw, IN) was used, and the surgical approach was posterolateral in 120 hips and anterolateral in 47 hips. Five dislocations (2.9%) were observed. There were no differences in patient and surgical parameters between the dislocation and no-dislocation groups. However, all the dislocations occurred in patients with femur neck fractures and in the posterolateral approach group. In a multivariate logistic regression analysis adjusting for patient and surgical variables, the diameter of the mobile insert (Odd ratio 1.398, 95% Cl= 1.005-1.862, P=0.022) was identified as an independent risk factor for dislocation. In conclusion, the incidence of dislocation in total hip arthroplasty using a dual mobility cup is acceptable, and the diameter of the mobile insert is an independent risk factor for dislocation.

Abstract no.: 47313 DUAL MOBILITY TOTAL HIP ARTHROPLASTY COUPLED WITH ACETABULAR RECONSTRUCTION IN THE SETTING OF ACETABULAR DYSMORPHISM IN COMPLEX PRIMARY/REVISION ARTHROPLASTY. A CASE SERIES

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Acetabular dysmorphism may arise from several conditions such as developmental dysplasia of the hip (DDH), trauma, dislocations etc. This is a cause for concern for the surgeon when dealing with complex primary or revision hip arthroplasty. Failure rates are higher as the seating of the acetabular component may be compromised, giving rise to the possibility of further revisions secondary to dislocations and/or wear. In this report, we present our experience using cemented dual-mobility total hip arthroplasty (THA) coupled with acetabular reconstruction in two patients: in a patient with a dislocated 1st stage revision hip arthroplasty and one with chronic neglected DDH. In both cases, the surgical incisions healed well and they were advised to keep toe-touch weight-bearing to minimize joint reaction forces for 3 months. At 5 and 3 months post-operatively, both patients are mobilizing weight-bearing comfortably and independently with fully aids. Dislocation/instability is a significant complication following revision/complex primary hip arthroplasty. In dual-mobility THA, the presence of two articulation surfaces increases the primary arc of motion prior to impingement thereby potentially reducing the risk of dislocation. The presence of two articulations may also reduce stresses on the acetabular implant-cement and cement-bone interfaces. This has the added benefit in the setting of acetabular reconstruction using structural graft augments whereby reductions in stress and strain may provide a better environment for bony union. Dual-mobility THA coupled with acetabular reconstruction is a viable option in the setting of acetabular dysmorphism for complex primary/revision hip arthroplasty.

Abstract no.: 47397 TOTAL HIP ARTHROPLASTY USING DIRECT ANTERIOR APPROACH AND DUAL MOBILITY CUP: IMPLICATIONS FOR IMPLANT POSITIONING. CONSECUTIVE SERIES OF 200 THAS Sebastien LUSTIG, Cecile BATAILLER, Elvire SERVIEN Lyon Croix Rousse University Hospital, Lyon (FRANCE)

Aim: We hypothesize that a dual mobility cup can be safely used via the direct anterior approach, without increasing the risk of complications or incorrect positioning. Materials and methods: This retrospective study compared 201 primary total hip arthroplasties using a dual mobility cup performed via direct anterior approach without a traction table, to 101 arthroplasties performed via posterolateral approach. Implant positioning, function scores, and early complications were recorded. Results: Implant positioning was appropriate in both groups, with a higher cup anteversion in direct anterior approach. The complications rates were similar in both groups, with no dislocation or infection. Conclusion: The direct anterior approach without traction table associated with a dual mobility cup does not increase the risk of complications or non-optimal positioning of implants. This strategy is interesting for patients with high risk of postoperative dislocation.
Date: 2017-11-30 Session: Hip Complications & Instability Free Papers Time: 14:00 - 15:30 Room: 02. Roof Terrace

Abstract no.: 47112 DURATION AFTER LUMBAR SPINAL FUSION SURGERY AFFECTS TOTAL HIP ARTHROPLASTY OUTCOMES

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Recent papers have shown that patients with previous spinal fusion demonstrate poorer functional outcomes after Total Hip Arthroplasty (THA). However, there is limited literature examining the relationship between the duration after spinal fusion surgery to THA and functional outcomes. A review of 82 consecutive patients who had prior spinal fusion surgery who underwent elective THA from 1st January 2006 to 31st December 2015 was conducted. Patients were split into two groups - one where the duration after spinal fusion surgery to THA was less than 3 years (Group A) and one where the duration after spinal fusion surgery to THA was more than three years (Group B). Data on functional outcomes such as the Oxford hip score (OHS), total SF-36 score and total Western Ontario and McMaster Universities Arthritis Index (WOMAC) score was prospectively collected at 6 months and 2 years follow up for comparison. There were 40 patients in Group A and 42 patients in Group B. Patients who had THA less than 3 years after spinal fusion surgery exhibited better functional outcomes after THA than patients who had THA more than 3 years after spinal fusion surgery [postoperative 6 months WOMAC (265.64 to 245.85, p = 0.033) and postoperative 2 years WOMAC score (277.88 to 256.08, p =0.037)]. This study demonstrates that patients who had THA less than 3 years after spinal fusion surgery achieved better outcomes than their counterparts. This has clinical significance in counselling patients with previous spinal fusion undergoing total hip arthroplasty.

Date: 2017-11-30 Session: Hip Complications & Instability Free Papers Time: 14:00 - 15:30 Room: 02. Roof Terrace

Abstract no.: 46239 IMPACT OF LIMB LENGTH DISCREPANCY ON FUNCTIONAL OUTCOME FOLLOWING TOTAL HIP REPLACEMENT

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Introduction: In many patients, after Total Hip Replacement (THR) the outcome is not so good. One of the purported reasons is limb length discrepancy (LLD). The study was conducted to determine the impact of limb length discrepancy following total hip replacement on functional outcome. Method: 100 patients who underwent unilateral primary THR were included. Each patient was evaluated pre-operatively and after six months of surgery. True limb length and apparent limb length were measured on the operated limb and compared with contralateral side to assess the true and apparent limb length discrepancies. On x-rays, limb length discrepancy was determined by measuring vertical distance from inferior margin of teardrop to superior margin of lesser trochanter on operated limb and contralateral normal limb on antero-posterior views of pelvis with both hips with both limbs in neutral position and no pelvic obliquity. In order to assess the impact of limb length discrepancy on functional outcome, Harris Hip Score (HHS) and SF-36 Health Survey Questionnaire were used. Results: HHS was lower in patients with LLD of ≥20mm. However SF-36 scores did not correlate with LLD after THR in our study. Conclusion: This study highlights the importance of informing patients pre-operatively about the risk of LLD after THR and the associated negative impact this may have on their outcome. Though every measure should be taken to avoid LLD, however it is paramount to restore stability as our study has shown that LLD upto 20mm has no detrimental effect on functional outcome.

Abstract no.: 48210 CONGENITAL TALIPES EQUINO VARUS (CTEV) TREATMENT USING ILIZAROV FRAME: 10 YEAR EXPERIENCE AT BEIT CURE HOSPITAL, MALAWI

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Introduction: Ponseti treatment of clubfoot revolutionized clubfoot treatment. However this treatment is most effective for children below 4 years. Triple arthrodesis is the treatment of choice for skeletally mature children. Children between 5 and 12 years pose a challenge to treatment because they are too old for Ponseti treatment, too young for triple arthrodesis and too old for soft tissue posteromedial release alone. Aim: This study describes our experience of using Ilizarov frame to treat CTEV in children between 6 and 12 years. Methods: Children between 6 and 12 years with CTEV treated between 2007 and 2017 with Ilizarov frame were reviewed. The frame has 7 motors which gradually correct the feet. Some patients needed a calcaneal osteotomy. The average length of correction was 4 weeks after which tibialis anterior tendon transfer to either the lateral cuneiform or peroneus tertius was done to balance the foot. Results: Over 30 CTEV feet have been treated with Ilizarov frame in our institution. Some children have had bilateral frames applied at the same surgery. Superficial wound breakdown and pin track infections occurred in some patients. Very high patient reported satisfaction was reported. Conclusion: Ilizarov frame can be used for the treatment of severe CTEV in a specific group of patients leading to very high patient reported outcomes. Most patients were very happy with the aesthetic appearance of the foot compared to the foot before surgery. The post operation function of the foot was much better than it was pre operatively.

Abstract no.: 46753 A SYSTEMATIC APPROACH FOR SURGICAL TREATMENT OF CONGENITAL VERTICAL TALUS: MID-TERM FOLLOW UP OF 96 CASES Viachaslau BRADKO, Heorhi BRADKO, Aleksandr BELETSKI Republic Scientific & Practical Centre of Traumatology and Orthopaedics, Minsk (BELARUS)

Background: Congenital vertical talus is a rare and challenging cause of flatfoot to treat. We hypothesized that a classification scheme and operative approach dictated by the specific deformity and age of the patient could better inform management of this abnormality. Methods: Classification (type I-III) was based on the respective talarcalcaneal angle (30-40°/40-50°/50-70°) and tibial-talar angle (100-130°/130-150°/150-180°). Patients with type I deformity did not require operation. For type II, closed talonavicular manipulation and closed bringing down of calcaneus was utilized. To reduce the risk of avascular necrosis in type III deformity, patients underwent gradual talar repositioning without isolation or release. This technique was modified based on patient age. For patients under 1.5 years old a ligature was placed in the talar neck and fastened posteriorly. The peroneal tendons and triceps muscles were lengthened. For patients 1.5-3.5 years old wire was used instead of ligature. The talus was reduced with interval traction for two weeks. The cast was removed at 6-7 weeks and the patient placed in ankle-foot orthosis for four months. An Ilizarov fixator was used for 1-2 months in children older than 3.5 years old. Results: We treated 74 patients (96 feet). 48 patients (61 feet, 54% female and 46% male) had type III deformity and 26 patients (35 feet, 61.5% female and 38.5% male) type II deformity. Patients were followed for 6.5 years, with good results in 76% of cases. Discussion: These minimally traumatic surgical methods preserve functionality of the foot and produced promising outcomes.

Abstract no.: 46992 RELAPSE OF DEFORMITY AFTER PONSETI TREATMENT OF CLUB FOOT

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INTRODUCTION: Ponseti technique has become a popular method of treatment for Congenital Talipes Equinovarus. However relapse of deformity is quite common. METHOD: During January 2000 to December 2014, 322 feet in 273 patients, 249 males and 73 females with average age of 19 days (range 3-30 days) were treated by this method. Not included in this study were 42 patients who came late, 23 associated with arthrogryposis or spinal dysraphism. Deformity was mild in 47 and moderate in 72 and severe in 203. Achilis tenotomy done in 274 patients. All patients were prescribed, foot ankle orthosis/Denis Brown Splint. FOLLOW UP & RESULTS: All patients were followed up every month for 1 year then every 3 months afterwards. Followup was of 2-10 years (average 5.5 years). Relapse of deformity was seen in 82 (24.4%).2 cases of mild,14 cases of moderate and 66 cases of severe deformity develoed relapse. In 23 orthosis was not used as prescribed. Tendoachilis was tight in 52, tibialis anterior in 25, soft tissues of sole in 39. Peronei were weak in 14. In 32 patients there was more than 1 pathology. All 82 feet were given POP cast for 3-6 weeks with improvement in 36 and relapse again in 27. Tendoachilis was lengthened in 52, tibialis anterior in 25, posteromedial release in 24, split tibialis anterior transfer in 14. Relapse depended on failure to use orthosis as prescribed, degree of deformity and inherent nature of tissue in some patients.

Abstract no.: 48785 ASSOCIATIONS AND RISK FACTORS OF RELAPSED IDIOPATHIC CLUBFEET WHEN USING PONSETI METHOD Hatem Ahmed KOTB

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Introduction: Identifying risk factors associated with relapse, is an important issue in predicting and anticipating the outcome during the management of idiopathic clubfeet using Ponseti Method. Material: 258 feet of idiopathic clubfeet deformity in 165 children, were treated using the Ponseti technique. Patient prenatal, natal and family history were documented. Then foot abduction brace was used. Results were graded as fully plantigrade (good), not fully plantigrade (fair) and relapsed (poor). Results: The mean follow up was 39.5 + 21.9 months (range 3-78). Mean age at presentation was 72.1 + 144.1 days (1 day to 44 months). 118 (71.5%) were males. In 31 (12%) feet the parents refused the Ponseti management and under went open surgical release else were, and at their last follow up 10 (32.2%) feet were good, 14 (45.16%) feet were fair, 7 (22.5%) feet were poor. In the remaining Ponseti managed group of 227 (88%) feet at their last follow up, 137 feet (60.3%) were good, 74 feet (32.6%) were fair and 16 feet (7%) poor. Age at presentation (p=0.246) had no bearing on results. Relapse correlated positively with positive family history (p=0.007), and with non compliance (p=0.000). Open surgical release was associated with 16 fold increased risk for relapse p= 0.000 (95% confidence interval lower limit 6.55 and upper limit 41.45). Conclusion: Parents' compliance and devotion is a key factor for the successes of the Ponseti method. Open surgical release increase the risk of relapse.

Abstract no.: 47986 COMPARISON OF TWO DIFFERENT EDUCATIONAL MODELS IN CLUBFOOT TREATMENT TRAINING - PRELIMINARY DATA

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Ponseti Method has been considered the gold standard to treat clubfoot in the last 2 decades. It is very reproducible, but attention should be given to details; we try to answer the question which is the best model considering medical education in clubfoot treatment: the traditional approach, based on lectures and structured course or another model based on extensive, mentorship approach. We compare 2 different projects of clubfoot training in Brazil: one in 2007 and 2008 based on a 36 hours course with workshop and case discussion and a new program organized in a mentorship format, with closer contact mentor- trainee and a continuous contact with a Ponseti doctor's network. After the first program, 556 doctors were trained in the Ponseti Method in 21 cities in Brazil; from those, only 40 doctors are still treating children with clubfoot by Ponseti Method (7,2%). The Mentorship educational model is being used in the last 2 years in a Rotary International-PIA (Ponseti International Association) program with only 10 trainees being trained by 10 mentors, with a webconference, followed by 5 days interaction, case discussion and treatment of over 50 patients with clubfeet. Real problems in managing those patients appear and are dealt with. This program aims to train 50 doctors. The mentorship educational model for Ponseti Method training seems to be the best indicated to efficiently train doctors in the clubfoot treatment. The former, professoral approach is not able to provide good experience for professionals working with Ponseti Method for clubfoot treatment in children.

Abstract no.: 48201 ARTHRORISIS WITH FLATFOOT IMPLANT (FFI): 11 YEARS OF TREATMENT

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Introduction: arthrorisis with FFI is one option for the treatment of flatfoot (Pesabductoplanovalgus) in children. The aim of the study was to evaluate any correlation between various foot angles and their respective American Orthopaedic Foot and Ankle Society (AOFAS) scores for pain, and the correction clinical outcomes. Methods: In retrospective clinical follow-up study, all patients that were treated with arthrorisis with FFI from 2005 to 2016 were included. One foot was operated at a time, and the contralateral foot was operated 3 months later if indicated. Postoperatively, partial weightbearing was performed for 1 week. Assessment was performed before surgery, at 2 years followup. Foot angles including anteroposterior (AP) and lateral talocalcaneal (TC) angles, AP and lateral talo-first metatarsal (TFM) angles, calcaneal pitch angle and talonavicular (TN) ange were measured, as were AOFAS scores for pain for the forefoot, midfoot, and hindfoot and Visual-Analogue-Scale Foot and Ankle (VAS FA). Results: 997 patients were included in the study (mean age 10.9, 47% male). In comparison with the preoperative parameters, after orthosis treatment, all scores and all foot anges improved significantly, the AOFAS hindfoot score correlated positively with the lateral TC angle of the foot and VAS FA score were increased. The parameters did not differ between followups. Conclusion: Medial arch support orthosis significantly improved AOFAS scores and foot angles. Calcaneal pitch angle and lateral TC angle correlated well with AOFAS hindfoot scores. All relevant parameters improved after arthrorisis with FFI in pes planovalgus in children.

Abstract no.: 48189 THE PERFUSED, PULSELESS HAND FOLLOWING CLOSED REDUCTION OF THE PAEDIATRIC SUPRACONDYLAR HUMERUS FRACTURE, SHOULD WE EXPLORE OR OBSERVE? A SYSTEMATIC REVIEW

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Background: The pulseless paediatric supracondylar fracture following closed reduction is a surgical challenge. Whilst some advocate immediate vascular operative exploration, others recommend a period of careful observation and the use of adjuncts, such as Doppler studies to guide management. Our study critically appraises the evidence addressing the functional outcomes and complications, which will aid the decision making process and management. Methods: A systematic review of the literature was carried out to look for relevant studies relating to vascular injuries in supracondylar humerus fractures. A comprehensive search strategy was formulated for PUBMED, Embase and Cochrane to identify pertinent records. We noted the functional outcomes and complications in each study for those that were immediately explored vs. observed. Results: In total, 279 perfused, pulseless supracondylar fractures after closed reduction were identified. 91 were immediately explored and 188 initially observed, 37 of which underwent secondary exploration (19.7%). All patients had return of pulses. There was no significant difference in functional outcome (96.2% explored vs. 95% observed). We found an increased rate of Volkmann's contracture in the observation group (12.2%) vs. the exploration group (2.2%) and the rate of further investigations was greater in the observation group (54.8% vs. 17.6%). Conclusions: The absent pulse predicted an increased rate of complications and need for further investigations if this group is observed. We present an algorithm based on our findings, in which we recommend careful clinical assessment and the use of adjuncts, which would justify a period of observation and the parameters for exploration.

Abstract no.: 48153 LATERAL ELBOW SOFT TISSUE SWELLING AND LATE DISPLACEMENT OF MINIMALLY DISPLACED LATERAL HUMERUS CONDYLE FRACTURE – A NEW RADIOGRAPHIC MEASUREMENT Wu Chean LEE, Suraya ZAINUL ABIDIN, Kai Yet LAM, Arjandas MAHADEV KK Womens and Childrens Hospital, Singapore (SINGAPORE)

Introduction Lateral condyle humerus fractures (LCHF) are a common paediatric fracture which are largely minimally displaced (≤2mm) (MD-LCHF). Up to 12% of MD-LCHF experience late displacement. This can have serious functional sequelae. Lateral Elbow Soft Tissue Swelling (LESTS) has been suggested as a risk factor for displacement. Our study aims to investigate the association between LESTS and late displacement of MD-LCHF. Methods 88 patients with MD-LCHF with late displacement were matched with patients with MD-LCHF that remained undisplaced. Anteroposterior radiographs of the elbow were analysed and 2 measurements taken. The lateral soft tissue at the level of the proximal edge of the fracture (M1) and the lateral soft tissue 2 cm above the metaphysealdiaphyseal junction of the distal humeral shaft (M2) were measured. The LESTS ratio (M1 / M2) was analysed for both groups of fractures using binomial logistic regression. Results Mean age of patients was 5 years. The LESTS ratio was significantly larger in the group with late displacement (1.01 \pm 0.27 vs 0.89 \pm 0.18, p = 0.001), with odds ratio of 14.1 (95%) CI 2.9 - 68.4). Conclusion Patients with a larger LESTS ratio are more likely to displace. This could be due to inadequate immobilization owing to the extent of soft tissue swelling and could be indicative of a more substantial fracture force, making displacement more likely. For every 1 unit increase in LESTS ratio, MD-LCHF are 14 times more likely to displace. This could be useful in identifying MD-LCHF patients at risk of displacement.

Abstract no.: 46251 FOR DISPLACED IRREDUCIBLE DISTAL INTRAFOCAL PIN REDUCTION TECHNIQUE THIRD RADIUS FRACTURE WITH OR WITHOUT DISTAL ULNA FRACTURE IN CHILDERN

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INTRODUCTION: This study describes a minimally invasive method to achieve satisfactory reduction and percutaneous fixation of distal third radius fractures in paediatric age group. This study presents the outcomes and advantages of this technique. METHODOLOGY: Prospective study was conducted on children which met the inclusion criteria of distal third radius fracture with or without distal ulna fracture, aged between 5 to 14 years with open physis and irreducible fracture after trial of closed reduction. Data was collected on demographics, infection, neurovascular injury, preoperative and postoperative angulation, and any malunion(Acceptable Angulation - upto 20 degrees for children younger than 10 years and upto 10 degrees for children older than 10 years) at last follow up of 3 months. RESULTS: Total of 30 children underwent reduction by this technique. Immediate postoperative alignment in all children was within acceptable limits .1 child had superficial pin tract infection which resolved with oral antibiotics .None of the children had postoperative neurovascular injury and all fractures were united at 3 months with no incidence of malunion. CONCLUSION: Intrafocal pinning can be used as a reduction tool for distal third radius fractures that cannot be reduced by closed manipulation .The complication rates of malunion and neurovascular injuries are negligible.

Abstract no.: 46392 BRODIE'S ABSCESS COMPLICATING PERCUTANEOUS KIRSCHNER-WIRE FIXATION OF DISTAL RADIUS FRACTURE IN CHILDREN REQUIRING SURGICAL DRAINAGE; A REPORT ON 2 CASES Paramita MITRA¹, Laszlo ZOLCZER¹, Patrick FADERO², Shah MAHIR¹, Karen DALY³ ¹Croydon University Hospital, ASHFORD (UNITED KINGDOM), ²Bedford Hospital, Bedford (UNITED KINGDOM), ³St.George's Hospital, London (UNITED KINGDOM)

Introduction: Chronic osteomyelitis complicating percutaneous Kirschner-wire fixation of distal radius fracture in children is very rare. We present 2 cases where the patients developed Brodie's abscess causing significant morbidity and requiring surgical intervention. 2 children, 8 and 10yrs old were treated for displaced Salter Harris type 2 distal radius fractures with manipulation and insertion of K wires followed by uncomplicated postoperative recovery. Both of them presented 10 months and 3 months later respectively with wrist pain and swelling. Both patients were found to have radiographic and MRI features of a juxtaarticular intraosseous abscess in the distal radius consistent with chronic osteomyelitis. The 8 year old child responded to intravenous antibiotics with radiological signs of improvement. Symptoms recurred a year later and repeat MRI and CT scans showed a substantial increase in size of the lesion with impending radial styloid cortical breach, which was managed with urgent surgical drainage. The 10 year old patient also required surgical drainage and curettage following MRI confirmation. In both cases physeal plate was intact.Staphylococcus aureus was isolated from both cultures and treated with intravenous antibiotics for 6 weeks. Discussion Surgeons should be aware of this serious complication with significant morbidity that can occur following a widely practiced routine paediatric trauma procedure all over the world to treat paediatric distal radius fractures. Percutaneous insertion of K-wire in distal radius fractures in children should be elected with caution and if a patient develops this rare complication, surgical drainage and appropriate post operative antibiotics should be instituted urgently.

Abstract no.: 46529 FEMORAL NECK LENGTHENING OSTEOTOMY AFTER GROWTH DISTURBANCE OF THE PROXIMAL FEMUR Mikhail TEPLENKIY Russian Ilizarov Scientific Center, Kurgan (RUSSIA)

Introduction: One of the common types of ischemic recognized deformities is valgus deviation of the epiphysis, shortening of the neck and hyperplasia of the greater trochanter, these transformations contribute to decentration of the head and impair the function of the gluteal muscles. Purpose. To examine the midterm results of applying the technique of gradual correction of deformity of the proximal femur. Materials and methods. We analyzed the results of treatment of 19 patients aged 5 to 15 years (mean age 10 years) with ishemic deformities of the proximal femur. Fifteen patients were DDH, two septic and two aseptic necrosis of the femoral head. Distribution of joints according Kalamchi criteria: group II -11, group IV – 8. The corrective-lengthening osteotomy through the base of femoral neck was performed in all cases. Results. The mean follow up was 59.78 months (range 46 to 103). Functional results in accordance with Colton's criteria: good (13-14 points) - 14, satisfactory (11-12 points) - 4, unsatisfactory - 1. The radiological findings according to Kruczynski: good - 11, satisfactory - 7, unsatisfactory - 1. Conclusions. The obtained results allow to consider our technique to be an effective intervention, which in certain clinical situations, can be an alternative to more complex reconstructive operations on trochanteric region.

Abstract no.: 46715 FLEXIBLE NAILING FOR FRACTUE SHAFT OF FEMUR IN CHILDREN AND ADOLOSCENTS IN DEVELOPING COUNTRIES Deepak ANANDAREDDY

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Back ground: Of all the bony injuries in children, 1.6 % is constituted by femoral shaft fractures. Surgical management with flexible intramedullary nailing becoming more widely accepted. The objective to study the functional outcome, duration of union and the complications of flexible nailing for femoral shaft fractures in children & adolescents. Material and Methods: Children and adolescents between the age group of 5-16 years with Femoral shaft fracture admitted to hospitals attached to J.J.M Medical College, Davangere in the period from September 2009 to September 2016. All patients underwent flexible nailing fixation for the sustained fracture. Patients were followed up between 3 months until 1 year after surgery. A total of 80 cases were studied without any sampling procedure. Result: The study included 53 male patients and 27 female patients aged from 5 to 16 years with mean age of 10.45 years. The follow-up ranged from 3 months to 1 year. Time to union ranged from 10 to 12 weeks average being 10.2 weeks. 9 patients had superficial wound infection and subsided with antibiotics. 13 patients had nail impingment and limb lengthening and shortening was seen in 8 patients each. Conclusion: Nailing gives adequate stability and resulting in rapid fracture union. Limited exposure of soft tissue limits infection and non-union. This avoids damage to the distal femoral physis. This is excellent technique for the treatment of diaphyseal fractures of the femur in children and adolescents aged 5 to 16 years. Keyword: Femoral shaft; Intra medullary; Diaphyseal; Flexible nails

Abstract no.: 46472 OPEN VERSUS CLOSED REDUCTION OF FEMORAL NECK FRACTURE IN CHILDREN

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Femoral neck fractures are uncommon in children, but there is no consensus in management strategy. We compared open and closed reduction of these fractures to evaluate treatment outcomes. Fifty patients including 29 boys and 21 girls, who presented with a femoral neck fracture were retrospectively reviewed. According to Delbet's classification, 31 patients were type II, 12 were type III, and 7 were type IV. Thirty-six patients were treated with open reduction and internal fixation with kinds of instruments. Fourteen patients were treated with closed reduction and internal fixation with cannulated screws. No significant difference was found in time of operation between two methods. However, bleeding volume in closed reduction was less than that in open reduction. According to Ratliff's system, avascular necrosis (AVN) was noted in 3 patients in open and 2 in closed group. Coxa vara was shown in 2 patients who were managed with open reduction and internal fixation with pediatric hip plate (PHP). One girl had a delayed union in closed reduction group. Both methods had similar healing time of fracture. Open or closed reduction with internal fixation is a simple and safe option for femoral neck fracture in children. It is debatable whether or not capsulotomy would make any difference in AVN. Coxa vara due to loss of reduction should be paid attention to in selection of internal fixation.

Abstract no.: 47293 TREATMENT OF LOWER LIMB TORSION IN CHILDREN

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In 1934 Sir Denis Browne described the use of a bar attached to shoes to treat toeing in and toeing out in Children. This was standard treatment until the 1970's when Stahli and later Ritter described frequent spontaneous correction, advised no immediate treatment but surgery for residual deformity. We found that spontaneous correction occurs, but only up to age 2 1/2 years. Moreland in 1980 established that torsion applied above and below a growth plate readily changes the rotation. Based on this scientific study, we have used the modern Denis Browne Bar at night to treat children with significant torsional deviations. Results have been gratifying up to age 10 years. Material: A retrospective study of 115 patients treated over 4 years is presented. Age groups were: 2-3 years: 50; 3-6 years: 38; 6-9 years: 23; 10 years: 4. Ninety-nine toed in, sixteen toed out. Methods: Success requires patient comfort, acceptance and family cooperation. By applying stickers to the bar during setting and later coloring the white shoes, the young patient personalizes their "special night shoes". The shoes are set comfortably out or in. A short 8" bar permits rolling over at night. The bar is used for 6 months. Results: Every patient corrected fully or within 5 degrees of normal foot progression. Conclusion: Children up to age 10 years who toe in or out can be readily corrected by the proper use of a Denis Browne Bar at night. Cosmetic appearance and function is significantly improved and surgery is avoided.

Abstract no.: 47860 LONG-TERM RESULTS OF FIBULAR-ACHILLES TENODESIS (WESTIN'S TENODESIS) FOR PARALYTIC PES CALCANEUS: IS HYPERCORRECTION AVOIDABLE? A LONGITUDINAL RETROSPECTIVE STUDY

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Purpose: To review all cases of patients submitted to Westin's tenodesis, who had calcaneus feet secondary to myelomeningocele sequel, in order to evaluate the anatomical change provided by surgery and also to verify, in a long follow-up time, the inversion of the deformity depending on the patient's age. Methods: In this longitudinal retrospective study, all medical records of patients with myelomeningocele sequelae submitted to Westin's tenodesis from 1993 to 2013 in a public, university hospital, were reviewed. Patients were contacted for new clinical and radiographic evaluations after a minimum of 36 months after surgery. The calcaneotibial angle was measured and the shortening of the fibula was calculated as the "intermalleolar height". Results: The study was based on 16 children (26 feet), aged 84.27 months in average at the time of tenodesis. The calcaneotibial angle increased significantly postoperatively, from 63.77 degrees in average to 70.54 degrees. Intermalleolar height and valgus ankle did not change significantly. Most patients had plantigrade feet after surgery, without pressure ulcers, and were able to use orthoses. Conclusion: Westin's tenodesis, with or without other associated procedures, can correct or improve the calcaneus and valous ankle deformity in patients with myelomeningocele seguelae. There was no association of the surgical result with age at the time of surgery. There was no inversion of the deformity in equinus during the follow-up time. Key words: Tenodesis; Myelomeningocele; Calcaneus; Ankle: Foot

Abstract no.: 48600 RISK FACTORS FOR UNDERCORRECTION OF PLANOVALGUS FEET IN CEREBRAL PALSY AFTER THE TRIPLE C PROCEDURE

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Background: Equinoplanovalgus is the most common foot deformity in cerebral palsy (CP). Different corrective osteotomies were described for flexible feet. Regardless of the technique, undercorrection and recurrence were reported. Several authors suggested reserving osteotomies for moderate deformities in good ambulatory patients. The calcaneal-cuboid-cuneiform (triple C) osteotomies were recommended for allowing correction at all deformity levels. Methods: The aim of the study was identify risk factors for undercorrection after triple C osteotomies (usually part of multilevel surgery) in a retrospective cohort of ambulatory, skeletally immature CP patients, with flexible planovalgus feet. We hypothesized that the type of graft used in the cuboid open wedge (strut versus cuneiform wedge) and the addition of peroneus brevis surgery affected the degree of correction. For assessment we used radiographic angles measured in standing anteroposterior (talonavicular coverage, and talo-first metatarsal) and lateral (calcaneal pitch, talocalcaneal, and talo-first metatarsal angles). Results: From a total of 32 patients with at least 1 year followup, we included only 19 patients (31 feet) with available early follow-up (less than 6 months) to differentiate undercorrection from possible recurrence. The mean age was 9.95y, with 54.8% of poor ambulatory status. Peroneus brevis surgery was done in 22.6%, and strut bone graft in 67.7% of feet. Feet with either strut graft or peroneus brevis surgery showed a statistically significant greater improvement in anteroposterior radiographic angles but not in lateral radiographs. Conclusion: The usage of strut graft and peroneus brevis surgery is associated with better correction of foot abduction as evidenced by radiological changes.

Abstract no.: 47441 ADEQUATE SCOLIOSIS CORRECTION MAY PREVENT FURTHER HIP SUBLUXATION/DISLOCATION IN SPINAL MUSCULAR ATROPHY (SMA) PATIENTS AFTER SURGERY

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Purpose: Thoracolumbar Scoliosis, pelvic obliquity and hip subluxation/dislocation are common in SMA patients. We analyze the simultaneous progression of these inter-related deformities after spinal correction surgery. Methods: We retrospectively reviewed 17 patients with SMA II and 6 patients with SMA III received posterior spinal fusion from T2 to pelvis in our institution during 1993-2013. Major curves Cobb angle (MCCA), pelvic obliquity (PO), femoral head coverage percentage (FHCP) were measured. Descriptive and parametric statistical analyses were used to evaluate the data. Result: The mean age at surgery was 13.7 years old (range, 7-42) and mean follow up was 7.4 years (2-19). Mean MCCA was 68.8° (30°-132°) and mean PO was 12.0° (0.1°-34.4°) preoperatively compare to 36.9 °(11.7°-67.3°) and 4.0 ° (11.7°-67.3°) postoperatively. At final follow up, the mean increase of MCCA and PO was 4.18° (-6.5°-19.7°) and 2.3 ° (-5.6°-11.2°) compare with initial postoperative radiographic appearance. Mean FHCP was 48.3% (0-92%) in concave side and 78.22% (28.5-99%) in convex side preoperatively compare to 43.60% (0-86%) and 72.72% (0-100 %) at final follow up. Thirteen hips with FHCP less than 33% were measured before surgery and additional six hips with this condition were observed at final follow up. Patients with initial postoperative MCCA less than 30° prevented newly developed concave side hip FHCP value less than 33% (p=0.011, sensitivity=100%, specificity=78.5%). Conclusion: Progressive hip subluxation and dislocation were still observed after spinal correction surgery. Less postoperative MCCA may prevent the further hip pathology in SMA patients at final follow up.

Abstract no.: 48000 PULMONARY FUNCTION AND SURVIVAL OUTCOMES IN DUCHENNE MUSCULAR DYSTROPHY SCOLIOSIS (COMPARISON OF THE DIFFERENCES BETWEEN SURGICAL AND NONSURGICAL TREATMENT)

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The objectives of the current study were to compare the pulmonary function, survival outcome, and functional level in surgically and conservatively. Methods: 187 pts with DMD scoliosis were consulted for surgery, and in close consultation, 93 pts underwent surgery, 94 patients refused. FVC, radiographic parameters (the Cobb angle, lordosis, and pelvic obliquity), and functional status, according to the Vignos scale were measured. Age and Cobb's angle were not different in both groups, but VC was slightly lower in conservative group. Mean follow up period was 5.57± 3.1 year. The death of the patient was confirmed by the Korea National Statistical Office Results Pulmonary function. Vignos scale, and radiographic measurements were similar for both groups at the time of the initial consultation (p > 0.05). At the final follow-up, all radiographic parameters were significantly improved in the surgical group. The Vignos scale was significantly different between the surgical and nonsurgical groups (8.9 \pm 0.78 versus 9.17 \pm 0.44; p = 0.008). Both groups showed a decrease in FVC at the time of the final follow-up, but the deterioration of FVC was significantly slower (p = 0.035) in the surgical group (145.5 ± 263 mL) than in the nonsurgical group (359.7 ± 123 mL). The death was 22 patients (23.4%, 22/94) in control group and 8 patients (8.6%, 8/93) in surgery group. Conclusion Surgery in patients who had MD scoliosis significantly decreased the rate of deterioration of FVC, mortality and functional scale compared with patients treated conservatively.

Abstract no.: 46912 SPRENGEL SHOULDER –SINGLE CENTER EXPERIENCE 2000/2016

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Background: Sprengel deformity is relatively rare congenital anomaly of shoulder girdle associated with scapula malposition and dysplasia as well as surrounding muscle hypoplasia and dysbalance. It results into cosmetic problems and limited shoulder motion with diminished functional ability. The aim for this study was to evaluate retrospectively the number of cases done in our institution and their outcome. Method: Between 2000 and 2016 we have seen 63 children with Sprengel shoulder deformity. We have treated surgically 47 patient, 16 patients were indicated for conservative therapy or declined surgical intervention. All patients in the surgically treated group were Cavendish classification III or IV. Surgery performed was modified Woodward procedure with resection of omovertebral bar, if present, under neurophysiology brachial plexus monitoring. Mean age at the time of surgery was 6.7 years (from 3 up to 19 years). Mean follow up was 4.5 years (from 1 up to 10 years). Results: Post-operative improvement in Cavendish score at least 1 grade was noted at 35 out of 47 patients. The mean abduction has improved from 85° up to 116°. The mean flexion/elevation has improved from 110° up to 150°. Conclusions: Slightly worse results compare to literature are possibly due to higher number of syndromic patients, patients with congenital scoliosis or Klippel-Feil syndrome. We have noted 3 post-operative brachial plexus palsy which resolved completely. Since the surgical procedure can result into brachial plexus compromise we strongly advocate the use of peri-operative neurophysiology monitoring as a part of standard procedural set-up.

Abstract no.: 48408 NON-VASCULARIZED FREE TOE PHALANX TRANSFERS IN CONGENITAL HAND DEFORMITIES

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INTRODUCTION: The incidence of congenital aphalangia is approximately 1.5/10000 live births. Different surgical options are available for the management of congenital short digits resulting from aphalangia. Free transfer of the toe phalanges to the hand without vascular anastomosis is a proposed option for reconstruction of congenital aphalangia. The goal of treatment is provide the child mobility and stability for pinch and grip activity. METHODS: We present our experience in the treatment of congenital hand deformities with nonvascular phalangeal transfers from toes to the hand, for surgical reconstruction: six children who underwent a total of 10 transfers. The mean age at the time of surgery was 24.8 months. The patients were followed-up for a mean of 4 years with respect to functional results, yearly longitudinal growth, bone reabsorption, digital tip necrosis, fracture, angulation, alignment, infections, and donor site morbidity. RESULTS: We report one case of adactyly, one case of hipoplastic thumb, one case with congenital aphalangia of two fingers in the same hand and other three cases of aphalangia. On radiographic examinations, no fractures or angulation above 15 degrees were seen. Concerning to soft tissue complications, digital tip exposure developed in one patient (10%). No infections were encountered during the follow-up. All the patients exhibited minimal donor digit shortening. CONCLUSIONS: This technique is an option for digital elongation and, if performed in the appropriate age group, has the potential to allow growth and good function with a low complication rate.

Abstract no.: 47209 SURGICAL CORRECTION OF CERVICAL KYPHOSIS IN DIASTROPHIC DYSPLASIA WITH ANTERIOR CORPECTOMY, POSTERIOR TETHERING WITH 360° FUSION

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Background: We describe the patient characteristics pre- and post-surgery for anterior corpectomy with cage implantation and posterior tethering compared to a matched control of posterior only fusion technique. Methods: This is a retrospective study of patients with diastrophic dysplasia who underwent cervical spine surgery. These patients underwent either anterior corpectomy and 3600 fusion or posterior fusion alone. Indications for surgery included cord compression with or without myelomalacia, cervical instability and severe or progressive kyphosis. Neurologic examinations both pre- and post-op, blood loss, and complications such as pseudoarthrosis were also reviewed. Results: A total of 47 patients with diastrophic dysplasia were collected from 1984 to 2015. Nineteen patients were followed for cervical kyphosis and six of those patients required surgery. Two of the 4 in the anterior group had cord compression with myelomalacia seen on flexion and extension magnetic resonance imaging. Two patients were treated with posterior tethering only to allow for anterior growth due to instability or progressive kyphosis. The mean estimated blood loss was 294mL anteriorly and 75mL posteriorly. All patients were noted to have a complete fusion. One patient sustained a dural tear, which was successfully repaired. The mean starting Cobb angle was 90 degrees of kyphosis in the anterior group and 70 degrees of kyphosis in the posterior group. Post-operatively, the mean for the anterior group was 20 degrees of kyphosis and 23 degrees of lordosis in the posterior group. Conclusion: Spontaneous resolution is common in children with cervical kyphosis in diastrophic dysplasia. There exists a subset of patients with stiff, progressive, severe curves who develop cord compression and myelomalacia. This can be more effectively managed with anterior decompression along with anterior and posterior fusion to improve overall cervical alignment and prevent further cord damage.

Abstract no.: 46183 RESULTS OF A USING 4 HOLE PLATE TO CORRECT LEG LENGTH DISCREPANCY

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Shortening of a leg over 2 sm conducts to infringement of all biomechanics of the lower extremity and it is a reason of overload of adjacent joints, subluxation of the femoral head on another side. Materials and methods: In our study we use two groups of patients: in group 1 (2 hole plate) were 19 patients. Mean age was 11.5 years old and mean discrepancy before operation was 3,1 sm. In the second group (4 hole plate) we had 15 patients. Mean age was 12.3 years old and mean discrepancy was 3,1 sm, same as a group 1. The plates was installed on a lateral and medial surface of a distal femur. Patients were followed until the end of the bone growth. Results: In Group 2, where the 4 hole plate was used was determined a faster rate of correction than in group 1 with a high degree of statistical confidence (p<0,01). Mean rate of correction in group 2 was 1,5 sm per year. In 80% of cases it was possible to compensate discrepancy completely, at 13,4 % the residual discrepancy made from 0,5 to 1 sm, and only at 6,6 % of patients the residual discrepancy made above 1 sm. Discussion: Guided growth is acceptable method for the treatment of leg length discrepancy. Excellent and good results can be obtained using both 2 hole plate and 4 hole plate. But use of 4 screws plate increases the rate of correction of a leg length discrepancy.

Abstract no.: 46661 "TEMPORARY" SHORT-SEGMENT RIGID INTERNAL FIXATION FOR TEENAGERS' ISTHMUS SPONDYLOLYSIS

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Abstract : Objective : To introduce a new operation for teenager's isthmus spondylolysis, and evaluate the clinical efficacy. Methods: 20 cases of teenagers' isthmus spondylolysis patients with chronic low back pain, using "temporary" short-segmental pedicle screw combined with transverse device fixation, and isthmus bone graft repair treatment. X-ray and CT image were evaluated during the regular follow-up to confirm successful bone graft fusion, and then we remove the fixation. Lumbar MRI examination was performed before, 1 year after the fixation operation and 1 year after the remove operation. Modic grading and pfirrmann grading standard were used to observe effect of "temporary" fixation on the corresponding vertebral endplate and the intervertebral disc. Results: 20 cases were followed up for 2 years on average. The low back pain symptoms disappear completely, Xray and CT show that the isthmuses in all patients achieved bony fusion. As internal fixation removed, the fixed segment motion recovered. "Temporary" rigid internal fixation does not increase the corresponding vertebral endplate and intervertebral disc degeneration. Conclusion: "temporary" short-segmental pedicle screw combined with transverse device fixation is a simple and effective method for teenagers' isthmus spondylolysis, with rigid internal fixation as well as high rate bone graft fusion. Key words: lumbar isthmus spondylolysis; short segment fixation; temporary; isthmus bone graft;

Abstract no.: 48642 MODELLING THORACOPLASTY IN PATIENTS WITH IDIOPATHIC SCOLIOSIS. PROSPECTIVE CONTROLLED STUDY Oleg DULUB, Darya TESAKOVA, Alexandr BELETSKI, Andrey MAZURENKA, Dmitry TESAKOV Republic Scientific-Practical Center of Traumatology and Orthopedics, Minsk (BELARUS)

This prospective randomized controlled study was performed in RSPCTO, Belarus to develop new surgical technique of modelling thoracoplasty (MT) in patients with Idiopathic Scoliosis (IS) to achieve higher patient treatment satisfactory rate by rib cage asymmetry decrease. Methods: Modelling thoracoplasty was performed in 12 patients who previously underwent posterior deformity correction. 14 patients who underwent deformity correction only, without thoracoplasty were taken as control group (non-thoracoplasty, NT). To evaluate the outcome of MT the radiological parameters (CT 3D-reconstruction), pulmonary functions (FVC and FEV1) and clinical outcomes (SRS-24 questionnaire combined with authors additions) were examined before and after MT and were compared with NT group. Results: Through the same posterior incision, the ribs on the convex side were exposed by lateral retraction. Size of shortening was determined by patients breathing parameters during surgery. Osseosynthesis for rib parts was performed with bone suture by author's methodology. Pleural drainage was put for 3-5 days. Patient verticalization performed on 2-3 day post-op. Among noticeable complications haemopleura occurred in 2 cases and was resolved by repeated drainage. Post-op CT 3Dreconstruction showed significant rib cage assymetry decrease (P<0.05) and preserving of the rib cage integrity. This was also proved clinically and with the SRS-24 questionnaire. There were pulmonary function altering absence and low rate of post-op pulmonary complications (p<0,05). Conclusion: Modelling Thoracoplasty new surgical technique showed its high effectiveness in the rib deformity correction which allowed to preserve the rib cage integrity with low pulmonatory complications rate and high patient satisfactory score.

Abstract no.: 48512 BILATERAL DISPLACED LATE PRESENTING ASYNCHRONOUS TRAUMATIC SALTER HARRIS TYPE II TRANSPHYSEAL HIP FRACTURES Khaled EL ADWAR (EGYPT)

Background: Transphyseal hip fractures without dislocation (Delbet tybe Ia) are extremely rare injuries. This is the first report of a bilateral case. Case Report: A 4-year-old girl with global developmental delay, who walks supported, fell off her bed during an epileptic fit. The parents presented 2 weeks later, and radiographs and CT scans revealed an anteriorly displaced right Salter Harris type II transphyseal upper femoral separation, with loose bony fragments within the joint mimicking heterotopic ossification. Under general anaesthesia, surprisingly the physis was reduced anatomically using the Leadbetter manoeuvre. Fixation was carried out with 3 smooth Kirschner wires, and the hip was immobilized in a spica cast. She was followed up for 7 months, where uneventful healing occurred with no sign of avascular necrosis. Sixteen months following the first injury the girl had another traumatic seizure which resulted in a greenstick fracture of her left distal femur. Unfortunately, this drew the treating physician's attention and an identical left hip physeal injury was missed. On presentation 3 months later, stress radiographs showed nonunion of the physis. Axial CT images showed sclerosis of the distal metaphyseal fragment. Because of the significant delay it was thought that this side would carry a bad prognosis. Fortunately, the Leadbetter manoeuvre succeeded in reducing the physis, which was fixed using 2 smooth Kirschner wires. Seen 1 year following surgery the physis had united with no ishaemic necrosis. Conclusion: Transphyseal Salter Harris Type II hip fractures can be reduced closed, even if neglected, with a favorable outcome.

Abstract no.: 48467 ARTHROSCOPIC REDUCTION AND INTERNAL FIXATION WITH CANNULATED CANCELLOUS **SCREWS** FOR TIBIAL AVULSION CLINICAL AND FUNCTIONAL OUTCOME OF 50 FRACTURES -PATIENTS Sahil SANGHAVI Sancheti Institute for Orthopaedics and Rehabilitation, Pune (INDIA)

Introduction: ACL avulsion fractures are one of the most common injuries around the knee. Various techniques have been described i.e. open vs arthroscopic as also different methods of fixation like screws, staples, sutures, K wires, etc. but till date there is no gold standard for managing these injuries. Aim: To study the clinical and functional outcome of arthroscopic management of tibial eminence avulsion fractures using cannulated cancellous screws. Materials and Methods: We studied 50 patients with isolated ACL avulsion fractures. We excluded those patients with open fractures, knee dislocations, concomitant injuries to the knee (meniscal/collateral ligament injuries) and ipsilateral limb fractures. Patients were assessed using the International Knee Documentation Committee (IKDC) score, Lysholm knee score and KT-1000 arthrometer with minimum follow-up of 1 year. Radiographs were taken to assess union. Results: The mean age of our patients was 29.5 years. 16 patients had a type II fracture, 26 had a type III and 8 had a type IV fracture. The mean Lysholm score was 96.1 and mean IKDC score was 92.4. The KT-1000 arthrometer side-to-side measurement did not show any significant difference. All patients obtained radiological union in a mean period of 8.1 weeks and all patients eventually returned to their pre-injury occupation. Conclusion: Arthroscopic fixation appears to be a better alternative to open techniques, provides earlier recovery and lesser complications compared to those shown by open techniques. Results were also comparable to other arthroscopic methods such as suture fixation.

Abstract no.: 47635 HISTOPATHOLOGICAL AUDIT OF ARTHROSCOPIC SYNOVIAL BIOPSIES DONE FOR PERSISTENT KNEE EFFUSIONS

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Monoarticular knee pain and swelling has a plethora of differential diagnoses. The presence of multiple comorbidities and unremarkable blood results may pose a diagnostic challenge.We retrospectively reviewed the clinical presentation and histopathological diagnoses of patients who had arthroscopic synovial biopsies for persistent undiagnosed knee effusions.Comorbidities,blood results (white cell count, C-reactive protein and ervthrocyte sedimentation rate) and histopathological diagnoses were recorded. Out of 194 arthroscopies, 19 patients had biopsy done. Only 10 histopathology results were found.Mean age was 40.6 years (range 24-55 years).All cases presented with knee effusion and pain. Median duration of symptoms was 3.25 years (range 1-8 years). Two patients were documented HIV positive with one having co-existing systemic lupus erythematosus. One had previous tuberculosis and there was one rheumatoid arthritis.Mean white cell count was 6.13x10⁹/L (range 4.56-8.60x10⁹).Median ESR was 17mm/hr (IQR 15-19) and CRP range was 3-20mg/L.Histopathology revealed 3 cases of pigmented villonodular synovitis(30%), 2 cases of synovial lipomatosis(20%) and 1 each of mycobacterium tuberculosis, rheumatoid arthritis, connective tissue disease, chronic svnovitis and combined necrotising and non-necrotising granulomatous inflammation. Diagnostic arthroscopies are overshadowed by the need for therapeutic intervention for ligament or meniscal repair. However it still has a role in clinching a diagnosis in cases of long standing knee effusions that pose a diagnostic dilemma. This study reveals a wide range of synovial disorders causing chronic knee pain and effusions.PVNS and svnovial lipomatosis were the leading histopathological diagnoses. Arthroscopic synovial biopsy is reliable in reaching a histopathological diagnosis in cases of persistent undiagnosed painful knee effusions.

Abstract no.: 47451 EFFECT OF TIMING ON OUTCOMES OF ACL SURGERY Joseph Benjamin KANG, Andrew Hwee Chye TAN

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Introduction: Amongst patients who undergo anterior cruciate ligament (ACL) reconstruction for ACL tears, little is known on the impact of the timing which the intervention is undertaken with respect to the incidence of the injury. This study looks at the effects in surgical treatment involving anterior cruciate ligament reconstruction in the early and late phases of injury and compares the effect on the outcomes post-operatively. Methods: A retrospective study involving 138 patients obtained within our institution by a single-surgeon and followed up for a period of 2 years. Data was collected on timing of injury and date of surgery and post-operative assessments at 3 months, 6 months, 1 year and 2 years were based on range of motion of knee, IKDC scores, Lysholm Knee Scores and Tegner scores. We further subdivided the timing of ACL reconstruction into early (less than 3 months) and late(more than 3 months). Results: Early operation of ACL tears results in superior IKDC lachman scores at the 6month, 1 year, and 2 year mark. (p<0.05). However, subjective scores such as the Lysholm score, Tegner scores were relatively unaffected. Discussion: Early ACL reconstruction does appear to confer superior IKDC scores as compared to late surgery, especially after 6 months post-operatively. This has to be balanced out with existing literature which advocates not operating within the acute phase of knee swelling (first month) which results in increased risk of arthrofibrosis and graft failure.

Abstract no.: 46711 PROGRESSIVE POSTERIOR ROOT TEARS OF THE LATERAL MENISCUS - BIOMECHANICAL CONSEQUENCES

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Introduction: The effect of sectioning of medial meniscus root have be studied in detail. Very few studies have looked at biomechanical effects of lateral meniscus root sectioning. Purpose: To create progressive radial tears in the lateral meniscus root, study the effects of the tears on the joint contact forces. We aim to find if progressive radial tears produce significant biomechanical changes; if yes what a cut-off percentage of tears actually begins to produce these changes. Methods: Ten fresh frozen cadaveric knees (arthritic knees excluded) were dissected down preserving the ligaments and menisci. Pressure sensors were inserted underneath the menisci. This sample was mounted over a custom-made load testing frame. Progressive tears in the lateral meniscus was created finally with inclusion of meniscofemoral ligament followed by total meniscectomy. Joint pressure and joint surface area measured on the medial and lateral compartment at flexion angles from 0-90 degrees. One way repeated ANOVA was used as a test of significance. Results: Isolated complete tears of lateral meniscus root did not produce any significant change. It was only after additional resection of meniscofemoral ligament that significant changes were seen. Also the contact pressure and surface area changes were significant higher complete meniscectomy. Lateral meniscus root resection did not mimic with meniscectomized state as seen on medial side. Significance: Aggressive repair strategies may not be required for lateral meniscus root tear unless the meniscofemoral ligament is torn.

Abstract no.: 47411 A COMPARISON OF ACCURACY OF CLINICAL TESTS AND MRI IN THE DIAGNOSIS OF MENISCAL AND ANTERIOR CRUCIATE LIGAMENT INJURIES

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Abstract Purpose: The purpose of this study was to compare the accuracy of clinical examination against MRI in the diagnoses of meniscal tears and ACL raptures. Methods: Between January 2011 and December 2015, 147 consecutive cases of previous knee injury were seen by the author. One hundred and one cases of suspected meniscal or/and ACL tears were recruited for the study. There were 68 males and 33 females, with a mean age of 35 years. All underwent arthroscopy for definitive diagnosis after clinical assessment; 67 of them underwent MRI scanning before arthroscopy. Accuracy, sensitivity, specificity, and positive and negative predictive values were calculated comparing clinical examination and MRI reporting. Results: There was a wide variance between clinical diagnosis and MRI reportage for meniscal tears. Clinical examination had negative predictive value of 25% against 6% for MRI. Both had high sensitivity of (87% and 92%) and low specificity (32% and 50%, respectively). The differences were statistically significant (P = 0.0164). There was little difference between clinical and MRI modes of diagnosis for ACL raptures with a negative predictive value of 8% for clinical examination against (4% for MRI) and a sensitivity of 92% and 96% respectively. Both had a high specificity (75% and 80%, respectively). The difference was not statistically significant (P = 0.6177). Conclusions: A careful clinical examination can safely diagnose almost all ACL injuries and most of the meniscal injuries. MRI should be reserved for more complicated and confounding cases.

Abstract no.: 47471 EXTENDED BLOCKADE OF PERIPHERAL PLEXUSES OF THE LOWER LIMBS AT ARTHROSCOPIC OPERATIONS IN CHILDREN Elena ARESTOVA Morozov Children Hospital, Moscow (RUSSIA)

A study including an analysis of anesthetic support at 63 arthroscopic operations. A comparison has been made between two groups, the main one with regional anesthesia (40 cases of narcosis) and control one (23 cases of narcosis) including people receiving central analgesia by intravenous administration of tramal in a dose of 2-2.5 mg/kg. The use of prolonged regional blockade of the peripheral plexus of the lower limbs by 0.5% ropivacaine during surgery and 0.1% in the case of the pain syndrome in the postoperative period gives a sufficient depth of anesthesia and the absence of additional influence on the hemodynamic parameters. It does not provoke the development of postoperative nausea and vomiting, creates comfortable conditions and allows to activate the patient earlier. In the postoperative period, pain indicators after regional anesthesia are reduced or nonexistent. Patients of the control group in the early postoperative period needed analgesia by perfalan, promedol or tramal. Wherein the frequency of re-injection of analgesics was up to three times a day. Conclusions Considering the analysis of the study results, we can conclude that the use of extended regional anesthesia during arthroscopic operations expands the base of painkillers in traumatology and orthopedics in children. This method is more effective and allows to abandon the use of narcotic drugs, protects patients from the pain syndrome in the early postoperative period, and also does not cause the development of the syndrome of postoperative nausea and vomiting. It also promotes the rapid rehabilitation of patients.

Abstract no.: 46547 EARLY CLINICAL RESULTS OF THE ACL-INTERNAL PILLAR: A TECHNIQUE TO PREVENT EARLY POSTOPERATIVE STRETCH OF THE HAMSTRING TENDON AUTOGRAFT AFTER ACL RECONSTRUCTION Mohamed ABOALATA¹, Abdelsamie HALAWA², Yehia BASSIOUNY¹ ¹ Mansoura University, Mansoura, Dakahlya (EGYPT), ²Banha University, Benha (EGYPT)

Introduction: Ligament reconstruction with autologous tendons undergo a temporary but may be profound stretch and weakening after reconstruction as evidenced during the ligamentization and remodeling process. Patients and Methods: 24 patients with ACL rupture had an arthroscopic single bundle ACL reconstruction augmented with the Internal Pillar technique where a strong non-absorbable tape (FiberTape, Arthrex) was used in the core of a Hamstring tendon graft (4-6 strands) and fixed independent of the graft both on the femoral and tibial sides. Both the graft and the tape were fixed with an Cortical fixation (Tightrope, Arthrex (femoral), a bio-absorbable interference screw (tibial) and the tape is additionally fixed on the tibial side. The IKDC, Lysholm and Tegner scores together with ROM, VAS for pain and instability, Lachman test, pivot-shift test were used for assessment. Results: A total of 20 were available for evaluation at one year (83.33%) with a mean follow up of 16.5 months (range, 12-18.5 months). There were no failures or limitation of the terminal extension. There were a significant improvement of the Lysholm, Tegner, and IKDC scores as well as the VAS compared to the preoperative scores (P < .05). Lachman test and pivot shift tests were negative with a median VAS for instability of 0.5/10. Patients returned to competitive sport at a median of 5.5 months with high satisfaction rate (95%). CONCLUSIONS: This technique may be beneficial in preventing the early stretch and laxity of the ACL graft.

Abstract no.: 47956 PRE-OPERATIVE JOINT INFLAMMATION: A PROGNOSTIC FACTOR FOR OUTCOME OF ARTHROSCOPIC ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION, A PROSPECTIVE STUDY

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59 elite players (mean age 26±5.146 years) with ACL injury, analysed for pre-operative synovial-fluid levels of Interleukin-1(IL-1), Interleukin-6(IL-6) and tumour necrosis factoralpha(Tnf-α). 23(groupA) operated with semitendinosus-gracilis-graft-preserved-tibial insertion (STGPI) and 36(groupB) operated with bone-patellar tendon-bone-graft (BPTB) after randomisation. Clinical outcome in terms of mechanical stability (KT-1000), functional outcome (VAS scores, Lysholm-knee score, Tegner-activity scale) and return to sports was observed, minimum for 1year follow-up. Results: Preoperative cytokines levels in groupA were: IL-1: 1.1±3.51, IL-6: 38.76±45.11 and Tnf-α: 0.55±2.66pg/ml, and in groupB were 3.02±10.77, 42.88±51.97 and 23.11±115.63pg/ml respectively. Mean VAS score at 1year was 0.08±0.3 (groupA 0.04±0.20, groupB 0.11±0.31). Mean KT-difference with contralateral knee at 1year was 1.33±1.1 (groupA 1.15±0.71, groupB 1.45±1.30). Mean lysholm and tegner-scale functional score at 1year was 98.7±2.25 & 7.15±1.55 (groupA 99.08±1.83 & 7.08±1.62, groupB 98.57±2.47 & 7.19±1.52). All interleukins (IL-1,IL-6 and Tnf- α) have positive significant correlation with post-operative VAS score at 1 year followup(spearman-correlation coefficient0.037, 0.364 and 0.109, multivariate-analysis pvalue0.007, 0.002 and 0.014 respectively). Only IL-6 (out of IL-1, IL-6 & Tnf-a) had significant correlation with KT-difference (spearman-correlation cofficient 0.740 and multivariate-analysis p-value< 0.00), Lysholm scores (spearman-correlation cofficient -0.436, multivariate-analysis p-value0.002) and Tegner-activity scale (spearman-correlation cofficient -0.570, multivariate-analysis p-value< 0.00) till 1year follow-up. No correlation between interleukins and return to sports at 1year (p-value0.274). No significant difference in mechanical stability and functional outcome between groupA and groupB at 1year follow-up

Abstract no.: 47198 ELECTRON AND LIGHT MICROSCOPIC ANALYSIS OF THE "LIGAMENTISED" ACL AUTO GRAFT: EVOLUTION OF THE GRAFT AND PRESENCE OF NERVE CELLS

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Introduction: ACL grafts aim to restore the static and dynamic mobility of the knee of which the dynamic mobility depends importantly on the presence of specialised nerve cells. The possibility of innervation of grafts in animal models has been documented but does it apply to human grafts as well after ligamentisation is what we seek to answer. Methods: Five ACL grafts were biopsied, four arthroscopically and one in masse, in different time periods ranging from one year to five years post-surgery. Four were semi tendinosus grafts and one was a BPTB graft. They were observed under a SEM and routine histopathology. Normal tissues were used for comparison. Results: The presence of nerve cells in the grafts under light microscopy was studied. Nerve cells were present in abundance in a graft done by the remnant preservation method when compared to the rest. Under the electron microscope the collagen fibre structure and diameter were compared. The heterogeneous pattern of the human ACL is however never restored even at the end of five years. Conclusion: Although the grafts were adapting over time toward a structure similar to the ACL, distinct differences remain. The presence of nerve fibres in the ACL graft is an important sign that points towards the right direction. There were a significantly higher proportion of nerve endings in a graft done by stump preservation. The ethical dilemmas in obtaining a satisfactory sample from previously done ACL graft limit our study.
Abstract no.: 47596 IS ACL GRAFT RUPTURE (AFTER SUCCESSFUL ACL RECONSTRUCTION AND RETURN TO SPORTS) ACTUALLY A GRAFT FAILURE OR A RE-INJURY?

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Introduction: Literature is ambiguous whether graft rupture occurring in a technically sound ACL reconstruction surgery, with satisfactory post-operative rehabilitation and successful return to sports, is due to graft failure or re-injury to the reconstructed ACL. We hypothesize that in such cases, it is an ACL re-injury rather than graft failure. Methods: 340 sportspersons underwent primary ACL reconstruction, with three different autografts (BPTB graft, STG preserved insertions graft and STG free graft). They were assessed for rupture/re-injury of the ACL graft and ACL injury of the contralateral knee. Group 1 (n=8) included patients with ACL graft rupture/re-injury, while group 2 (n=18) included patients with contralateral ACL injury. Both the groups were compared for certain risk factors for ACL injury. Results: 25 patients suffered a total of 26 injuries (21 males, 04 females). The ipsilateral ACL graft rupture/re-injury and contralateral ACL injury rates were 2.4% and 5.3% respectively. Both the groups were comparable for risk factors for ACL injury; age (p value=0.255), gender (p value=0.534), mode of injury (p value=0.523), level of sports activity (p value=0.473), type of graft used (p value=0.364), graft diameter (p value=0.607), duration from injury to index surgery (p value=0.492), duration from index surgery to reinjury (p value=0.638), timing of return to sports after index surgery (p value=0.303) and duration of sporting activity before second injury (p value=0.657). Conclusions: The risk of ACL tear in contralateral knee is double the risk of ACL graft rupture/re-injury in ipsilateral knee. Thus, it is an ACL re-injury rather than graft failure.

Abstract no.: 47379 PRE-SOAKING OF HAMSTRING GRAFTS REDUCES RISK OF INFECTION AFTER ACL-RECONSTRUCTION. A PROSPECTIVE STUDY INCLUDING 1000 PATIENTS

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Introduction: Post-operative infection of the knee is one of the major concerns following ACL-reconstruction. The purpose of this study was to investigate whether the pre-soaking of hamstring grafts in vancomycin reduces the incidence of post-operative infection. Methods: This prospective study included more than 1000 patients undergoing primary ACL-reconstruction over a period of 4 years. Group 1 received intra-operative iv-antibiotics without pre-soaking of the graft. Group 2 received iv-antibiotics and additionally the graft was bathed in a vancomycin solution of 5 mg/mL. Results: In group 1, a total of 2,3% of the patients suffered a post-operative joint infection. In contrast, there were no post-operative infections in the second group (0 %). Statistical analysis revealed a significantly reduced post-operative infection rate when bathing the autograft in vancomycin. Conclusions: Pre-soaking of hamstrings grafts with vancomycin combined with with classical iv antibiotic prophylaxis reduced the rate of post-operative infection when compared to iv-antibiotics alone. This technique should be utilized to reduce the overall incidence of knee inections following ACL reconstruction.

Abstract no.: 46974 FEASIBILITY AND COMPARISON OF FUNCTIONAL ULTRASONOGRAPHY (USG) IN DIAGNOSING ANTERIOR CRUCIATE LIGAMENT INJURY AS COMPARED TO GOLD STANDARD - MAGNETIC RESONANCE IMAGING (MRI) Sudeep KUMAR

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Introduction: Magnetic Resonance Imaging (MRI) has been gold standard investigation for diagnosing Anterior Cruciate Ligament (ACL) tear. MRI is not widely available and is costly investigation. We seek to explore the role of ultrasonography in such cases as it is cheap and easily available. Aim: To compare the outcome of functional ultrasonography with MRI scan in patients with clinical suspicion of ACL tear. Methods: Patients with clinical suspicion of having tear of ACL underwent functional USG evaluation. Patients were made to lie prone with towel rolled under the lower leg so as to make the knee flexed by 20 degrees. The procedure was performed as described in paper by H G Palm et al (2009). The difference in translation of tibia on femur with and without pressure was calculated and compared with normal side. Value of difference more than 1mm was considered significant. All the patients also underwent MRI scan to compare the results. Results: We recruited 130 patients. 91 of them had positive ultrasonography (>1mm of difference in translation). ACL tear was detected in 89 of those patients in MRI. 39 patients had negative ultrasonography. Of these 39 patients 22 of them had ACL tear on MRI. Sensitivity 80%, Specificity 89%, Positive Predictive Value 98%, Negative Predictive Value 44%. The p value of translation as .0001 which was significant. Conclusion: We can, on the basis of our study, safely recommend ultrasonography in suspected cases of ACL tears as first modality if investigation.

Abstract no.: 46860 PREDICTORS OF RETURN TO SPORTS AFTER ACL RECONSTRUCTION Ravi GUPTA, Anil KAPOOR, Ashwani SONI, Sourabh KHATRI, Gladson David MASIH, Mukta RAGHAV Government Medical College Hospital, Chandigarh (INDIA)

116 sportspersons, randomized into bone patellar tendon (BPTB) (n=58) or semitendinosus and gracillis graft with preserved insertion (STGPI) graft (n=58) underwent ACL reconstruction. Patient's age, graft type, delay in surgery, concomitant meniscal/chondral damage and type of sports were studied for return to sports at one year minimum follow up. 65/ 116 patients (56%) returned to their previous sports. 65% (47/72) aged between 16 - 25 and 41% (18/44) between 25 - 40 years returned to sports (pvalue=0.03), in 9.51±1.85 and 10.33±1.61 months respectively (p-value=0.10). 67%; (39/58) BPTB and 45%; (26/58) STGPI graft patients returned to sports (p-value<0.05) in 9.42±1.89 and 10.21±1.61 months respectively (p-value=0.08). 75% (27/36) operated between 2-6 months after injury, 51% (15/29) operated within 2 months, and 45% (23/51) operated after >6 months returned to sports in 9.39±1.9, 9.54±1.72 and 10.36±1.42 months respectively. The patients operated between 2-6 months significantly showed higher return to sports (p value< 0.05) but time to return between three groups was not significantly different. 62% (31/50) without chondral damage in 9.69±1.97 months, 51% (34/66) with chondral damage in 9.78±1.68 months; 67.5% (27/40) without meniscal tear in 9.37±1.94 months and 50% (38/76) with meniscal tears in 9.99±1.70 months returned to sports. (p-value>0.05). 65% (13/20) football, 65% (30/46) kabaddi, 47% (8/17) of athletes.57% (4/7) of volleyball and 33% (2/6) cricket players returned to sports; in other sports number of patients were insufficient to comment. Conclusion: - <25 years patients,

Abstract no.: 47994 POSITIONING OF ANTERIOR HORN BONE PLUG IN MEDIAL MENISCUS TRANSPLANTATION WITH ACL RECONSTRUCTION

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Background: The purpose of our study was to analyse relationship between anterior bone plug positioning in medial meniscus allograft transplantation (M-MAT) and outcome results in patients previously operated for subtotal/total meniscectomy and ACL reconstruction (ACLR). M-MAT in a patient operated for ACLR is a technically demanding procedure. Moreover, there is variation in anatomic location of root of anterior horn of medial meniscus. Hypothesis: Anatomic or central positioning of anterior horn bone tunnel for M-MAT has a significant better clinical and radiological outcome than medial positioning. Method: We retrospectively investigated 14 cases operated for M-MAT with past history of meniscectomy and ACLR from November 2008 to June 2013. Cases were divided into the anatomic or central (group 1) and the medial (group 2) based on positioning of the anterior bone plug tunnel for M-MAT. Clinical and radiological data pre- and post-surgery was assessed and compared. Results: There was no significant difference in 2-year postoperative IKDC... and AD... of both groups (p>0.05). The group with anatomic or central positioning of anterior bone plug showed significantly less absolute graft extrusion (AE) (p=0.042) and relative graft extrusion percentage (RE%) (p=0.007) on one-year follow-up MRI. Meniscus signal intensity was better in patients with central positioning of tunnel (p=0.301). Conclusion: Although there was no difference in clinical outcomes, but anatomical or central positioning of the anterior bone plug for M-MAT has less graft extrusion than medial positioning on MRI.

Abstract no.: 47952 ROLE OF PREOPERATIVE SYNOVIAL FLUID CYTOKINE MARKERS AND TYPE OF GRAFT IN CAUSING BONE TUNNEL WIDENING IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A PROSPECTIVE STUDY ON ELITE PLAYERS

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59 sportsperson (mean age 26±5.146 years) were assessed for preoperative synovial-fluid cytokine levels of Interleukin-1 (IL-1), Interleukin-6(IL-6) and tumour necrosis factor-alpha (Tnf-α). Patients were randomized into groupA operated with semitendinosus-gracilis-graftpreserved-tibial-insertion (STGPI; 23/59) and groupB with bone-patellar-tendon-graft (BPTB;36/59). Bone tunnel size was measured with 64-slice 3D-CTscan on 4thday (baseline), and at 1year follow-up to assess for tunnel-widening (TW), if any. Statistical analysis was performed to find correlation with preoperative cytokine levels, and/or grafttype. Results: Preoperative cytokines levels in groupA were: IL-1: 1.1±3.51, IL-6: 38.76±45.11 and Tnf-α: 0.55±2.66 pg/ml, and in group B were 3.02±10.77, 42.88±51.97 and 23.11±115.63pg/ml respectively. Baseline and 1year mean tibial tunnel sizes in groupA were: 8.3±1.1 mm & 10.4±2.31 mm, mean-TW 2.1mm (p-value=0.0003) and in groupB were 10.53±0.91mm, 12.04±2.17mm, mean-TW 1.51mm (p-value=0.0003) respectively. Baseline and 1year mean femoral tunnel sizes in groupA were 8.26±1.23mm, 10.14±1.75mm, mean-TW 1.88mm (p-value=0.0002) and in groupB were 10.55±0.92mm, 10.94±2.52mm, mean-TW. 0.39mm (p-value=0.386) respectively. Difference in TW between groupA and groupB was significant in both tibial (0.59±0.12mm,p-value=0.0001) and femoral tunnel(1.49± 0.119,p-value=0.0001). Of the three cytokines, only IL-6 showed significant correlation to tibial tunnel widening (p-value=0.005) in groupA only. No correlation of any cytokine level was observed with tibial tunnel widening in groupB (pvalue=0.551) or with femoral tunnel widening in groupA (p-value=0.828) and B(pvalue=0.502). It was also observed (multivariate-analysis)

Abstract no.: 48360 POSITIVE CORRELATION OF ANTHROPOMETRIC PARAMETERS AND MEASUREMENTS WITH AUTOGRAFTS FOR ACL RECONSTRUCTION Harald K WIDHALM¹, Veronika RÖGGLA¹, Martin RESCHL¹, Ines VIELGUT², Patrick SADOGHI² ¹Department of Trauma Surgery, Medical University of Vienna, Vienna (AUSTRIA), ²Department of Orthopedics and Trauma, Medical University of Graz, Graz (AUSTRIA)

Purpose: Aim of this study was to assess the correlation between patients' anthropometric data and measurements of potential tendons (quadriceps-, patella-, hamstrings-tendon) for an anterior cruciate ligament reconstruction. Methods: MR images of 102 patients with a mean age of 39.9 ± 18.9 (range 11 - 80) years have been analysed. Detailed measurements of the ACL were performed with respect to its length and angle. In addition the diameter and length as well as width of the guadriceps- and patella-tendon and the cross sectional area (CSA) and diameter of the hamstring tendons have been assessed. Patients' height, weight, BMI gender, and age have been recorded. The correlations of these measurements with the patients' anthropometric data have been calculated. Results: Thickness of the quadriceps tendon and patella tendon were 4.7 ± 1.1 mm and 3.2 ± 0.7 mm. The patients' height showed significant positive correlations with the CSA of the hamstring tendons, the length of the ACL, and the insertion sites of the ACL. Patients' weight showed significant positive correlations with patella tendon thickness, the CSA of the hamstring tendons, the length of the ACL, and the tibial and femoral insertion site. Patients' age showed a significant positive correlation with patella tendon thickness. The ICCs for intra- and inter rater reliability were 0.98 (95 % CI 0.95–0.99, p < 0.001) and 0.94 (95 % CI 0.88–0.99, p < 0.001). Conclusion Anthropometric data with respect to height, weight, and age can help to predict the size of tendons for the ACL reconstruction.

Abstract no.: 47308 ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH A NEW FEMORAL FIXATION DEVICE

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Background: A rupture of the anterior cruciate ligament (ACL) is one of the most frequent injuries in both recreational and professional athletes. Numerous techniques for surgical graft fixation have evolved over the last decades. The aim of this study was to compare the new RigidFix Curve system (DePuy Mitek, Raynham, MA) to other popular methods for femoral graft fixation. Methods: 26 participants with a mean age of 37.1 years were examined at a minimum follow-up of 12 months after ACL reconstruction with hamstring autografts. All procedures were performed by one single surgeon. Femoral fixation was performed with the RigidFix Curve system, tibial fixation by bioabsorbable interference screws. The Lachman test, the Lever Sign, the IKDC score, Lysholm score, Tegner activity scale (TAS) and Short Form 36 (SF-36) were used. Return to sports rates were analyzed. Results: Lachman and Lever Sign test was negative in all patents. The IKDC score (AM=87.5, SD=14.6), Lysholm score (AM=93.0, SD=11.5) and TAS (AM=5.7, SD=1.5) showed no significant difference compared to recent literature. Results of the SF-36, especially for the physical health component (PCS) (AM=54.8, SD=7.9) and the mental health component (MCS) (AM=49.4, SD=8.5) were excellent. There was no implant failure or graft rerupture. More than 70% of the patients returned to their preinjury level of sports. Conclusion: The results of the present study are promising, thus well powered prospective studies are necessary to confirm our results. In our opinion, the investigated method is safe and efficient.

Abstract no.: 47954 OUTCOME OF ACL RECONSTRUCTION WITH 'BONE PATELLAR TENDON BONE FREE GRAFT' VS. 'SEMITENDINOSUS- GRACILLIS GRAFT WITH PRESERVED INSERTIONS': A RANDOMIZED CONTROL TRIAL

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209 patients (mean age-25.19±5years;18-40years) underaoina primarv ACL reconstruction were randomized into group A[bone-patellar-tendon-bone(BPTB;n=105)] and group B[semitendinosus-gracilis-graft-preserved-tibial insertion(STGPI;n=104)]. Knee laxity, Lysholm, WOMAC score and return to sports were assessed at 6months and 1year. Mean follow-up time was 12.76±4.34 months (range26-6months). Mean duration of surgery for group A and B was 48±4.34 and 34±4.30 minutes respectively (p-value<0.01). Both groups were observed to be matching for age, gender. concomitant meniscal/chondral damage and immediate post-operative pain(p-value>0.05). At 6months follow-up side-to-side difference with KT-1000 for group A and B was 2.41±1.68mm and 2.52±1.60mm respectively(p-value>0.05), and at 1year follow-up it was 1.88±1.05 mm and 2.23±1.22mm(p-value>0.05) respectively. Lysholm score of BPTB and STGPI cohort at 6months was 93±4.56 and 90±5.69 (p-value<0.01) and at 1year 97±3.61 and 95.36±5.233 (p-value<0.05) respectively. WOMAC score of BPTB and STGPI cohort at 6months was 2.03±1.76 and 2.8±2.15 (p-value<0.05) and at 1year 0.47±1.02 and 1.2±1.76(pvalue<0.05) respectively. Return to sports with BPTB graft was 67%(43/64) as compared to STGPI 45%(29/64)[p-value<0.05]. Mean duration of return to sports with BPTB and STGPI graft was 9.46±1.90 and 10.11±1.58months respectively(p-value<0.05). 1 patient from BPTB and 2 from STGPI cohort had re-rupture of graft. Donor-site morbidities like hypertrophied scar(18 BPTB and 8 STGPI), anterior knee pain(13 BPTB and 0 STGPI) and patellar tendon ossification(1 BPTB) were more commonly

Abstract no.: 47920 COMPARISON OF GRAFT MATURATION IN ANATOMICAL DOUBLE BUNDLED ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION BETWEEN YOUNG AND ELDER PATIENTS

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[Purpose] The purpose of this study is to compare the graft maturation of anatomical double bundle anterior cruciate ligament reconstruction (ADB ACLR) in patients older than 40 years of age to younger patients. [Methods] We retrospectively evaluated 63 patients who underwent ADB ACLR with hamstring tendon autograft between January 2014 and December 2015. According to patients age, subjects were divided to three groups: (A)over 40 years, (B)20-39 years and (C)under 19 years. Graft maturation was evaluated by MRI performed with proton density-weighted images in an oblique coronal plane at 6 and 12 months postoperatively. Signal-to-noise quontient (SNQ) value was calculated for 2 specific graft sites (intra-articular site and femoral aperture site). SNQ value were compared between the three groups. [Results] SNQ value decreased at 12 months compared to 6 months in all groups. Although there was no significant difference in SNQ value between three groups at both time point, group A showed a tendency to have high SNQ value than other two groups at both time point. [Discussion and Conclusion] The most important finding of this study was that group A showed a tendency to have high SNQ value in both time point compared to other groups. This indicates delayed graft maturation in elder patients than younger patients. From this result, postoperative rehabilitation protocol and timing to return to sports should be considered carefully than

the younger patients. In conclusion, graft maturation tended to be slower in older patients

than younger patients.

Abstract no.: 48472 ARTHROSCOPIC ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION USING BONE PATELLAR TENDON GRAFT THROUGH A MODIFIED TRANS-TIBIAL TECHNIQUE. LONG-TERM FOLLOWUP

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Background: Anterior cruciate ligament (ACL) reconstruction using bone patella tendon graft is considered as the gold standard for treatment knees with ACL insufficiency. Transtibial tunnel placement has been given up owing to its non-anatomical tunnel positions. Purpose: The aim of our study was to analyze the long-term outcome of patients treated for ACL tears by anatomical single-bundle ACL reconstruction with patellar tendon autograft through a modified trans-tibial technique. Materials & Methods: We conducted a prospective study on a consecutive series of 642 patients who were operated, between Jan 2001 & Jan 2005. 405 patients were available for subjective evaluation: IKDC, Lysholm Knee Score. At time of ACL reconstruction, the mean patients age was 25.7±7years (range, 19 - 37years). The average postoperative follow-up was 144±7months (range, 137-151months). Results: The mean IKDC subjective score was 52.9 pre-operatively & 85.6 post-operatively, the Lysholm score was 49.1 pre-op and 92.3 post operatively. At 10 years follow-up, three patients required a re-intervention for bioscrew reaction, 4 patients developed arthrofibrosis and 1 patient developed tibial fixation site infection. Conclusion: Arthroscopic ACL reconstruction with patella tendon bone graft through the modified trans tibial technique is an excellent surgical option patients with ACL insufficiency. It has a better functional outcome in terms of good guality of life and patient satisfaction. Donor site morbidity can be markedly reduced with refined surgical techniques.

Abstract no.: 48264 THE RELATIONSHIP BETWEEN ACL FEMORAL TUNNEL POSITION AND POSTOPERATIVE MRI SIGNAL INTENSITY

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Background: The purpose of this study was to find the ideal femoral tunnel position in single-bundle ACL reconstruction (ACLR) using 3D-CT by comparing clinical scores, stability of the knee joint, and graft signal intensity on follow-up MRI. We hypothesized that positioning the femoral tunnel near the anteromedial bundle or center would lead to better results in terms of clinical outcomes and graft signal intensity on follow-up MRI than would positioning the tunnel near the posterolateral bundle. Methods: All patient underwent 3D-CT within 1 week after the operation and MRI at 1 year after the operation. We classified patients into three groups based on the femoral tunnel position: the anteromedial position group, the posterolateral position group, and the center position group. Results: This study included 77 patients: 25 patients in the anteromedial position group, 15 patients in the posterolateral position group, and 33 patients in the center position group. The 3 groups did not differ significantly (p>0.05) in preoperative demographic characteristics. There were no significant differences (p>0.05) between groups in clinical outcomes. However, patients in the anteromedial position group and in the center position group had better graft signal intensity on follow-up MRI than those in the posterolateral position group. Conclusions: Positioning the femoral tunnel near the anteromedial bundle and center led to better graft signal intensity on follow-up MRI in anatomic single-bundle ACLR than did positioning the femoral tunnel near the posterolateral bundle. There were no differences in clinical scores or stability of the knee joint among the three groups.

Abstract no.: 48224 AN EFFECTIVE PROTOCOL TO DIMINISH HIGH RENAL RISK PATIENT COMPLICATIONS

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Our institution developed a protocol to identify and prevent perioperative renal complications in the orthopaedic population. Between 2010 and 2015, 7658 consecutive total joint arthroplasty (TJA) patients were retrospectively reviewed. Patients with a calculated glomerular filtration rate (GFR) <40 mL/min/1.73m2, or GFR <50 with history of diabetes mellitus were flagged. Gadolinium, NSAID's and contrast were restrained, antihypertensive drugs were adjusted and a basic metabolic panel was ordered. Nephrology consultation was added to patients with history of end stage renal disease, dialysis requirement or renal transplantation. Chronic heart failure patients with NYHA IV or an ejection fraction <35% were also flagged. The protocol included avoidance of nephrotoxic antibiotics, radio contrast, sedatives, NSAID's, COX-2 inhibitors and muscle relaxants, ensuring adequate hydration and adjusting medication doses appropriately prior to surgery. During post-operative recovery, adequate urine output was ensured and patients were closely monitored for fluid overload, hyperkalemia or excessive bleeding. Meperidine was avoided, especially in patients with history of dialysis. Intra-venous cyclosporine or tacrolimus was given at one third of the oral dose for patients with history of kidney transplantation. In all drugs known to interact and be potentially nephrotoxic, the dose should be adjusted and serum levels closely followed. Only 6 (0.07%) out of 7658 patients developed renal complications after surgery. All 6 patients developed acute kidney failure, 2 had history of chronic kidney disease. All complications occurred in renal risk patients. When compared to a 1% average renal complication rate, this represents a 14.28 fold reduction in renal complication incidence.

Abstract no.: 47888 RESULTS OF GENDER-SPECIFIC TOTAL KNEE ARTHROPLASTY: COMPARATIVE STUDY WITH TRADITIONAL IMPLANT IN FEMALE PATIENT

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Purpose: To compare the incidence of overhang between two distinct femoral components and whether there is clinical and radiological benefit of gender-specific implants in shortterm follow-up. Materials and Methods: One hundred and four knees in consecutive 66 female patients who underwent primary total knee arthroplasty due to primary osteoarthritis were included in this study. Overhang was measured and recorded in every cut surface of femur with both gender-specific and traditional trial femoral components respectively in every patient. Then, the knees were divided into two groups according to the type of the permanent femoral component they received. Clinical and radiological outcomes were compared between 2 groups at minimum 3 years after operation. Results: Mean follow-up duration was 41.3 months (range, 36 to 50 months). Sixty two knees (59.6%) showed femoral overhang at least in one area with a traditional trial component, while 26 knees (25.0%) did with a gender-specific trial component (p<0.001). In terms of range of motion, Hospital for Special Surgery knee score, radiographic result, patella tilt angle and displacement, no significant difference was observed between two groups. Conclusions: The use of gender-specific implants substantially reduced the incidence of femoral overhang but did not demonstrate any clinical, functional or radiologic benefit in short-term follow-up.

Abstract no.: 48238 DOES SIMULTANEOUS BILATERAL TOTAL KNEE ARTHROPLASTY MAKE SENSE IN AN ERA OF BUNDLE PAYMENTS?

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In 2013, the Centers for Medicare and Medicaid Services (CMS) developed the Bundle Payments for Care Improvement initiative to reduce costs. To the best of our knowledge, no studies have examined the cost associated with bundle payments in bilateral total knee arthroplasty (TKA). In this study, we aim to provide a cost analysis of simultaneous and staged bilateral TKAs. Using CMS data, we retrospectively reviewed and analyzed the cost of all simultaneous and staged bilateral TKA procedures performed at one academic institution from January 2015 to June 2016. We defined staged bilateral procedures as two unilateral TKAs performed sequentially within one year. 104 staged and 226 simultaneous bilateral TKA patients were available for analysis. The simultaneous group was significantly younger than the staged group (mean age 68.9 ± 4.59 vs. 72.67 ± 5.57), and had significantly lower length of stay (mean LOS 2.62 \pm 1.53 vs. 4.02 \pm 2.00). There was no difference in BMI or gender composition between the two groups. Total cost per procedure was not significantly different between the groups, however, the staged procedures were on average \$3,213 more expensive than the simultaneous TKAs (mean total cost \$39,393 vs. \$36,180). Post-acute care cost was lower for staged TKAs when compared with simultaneous TKAs (mean post-acute care cost \$11,267 vs. \$13,971). Although not statistically significant, simultaneous TKA may be the cheaper option for the patient and physician alike. A large portion of these medical costs are stemming from inpatient rehabilitation and post-acute care costs.

Abstract no.: 47408 COMPARISON OF CLINICAL RESULTS AFTER TOTAL KNEE ARTHROPLASTY BETWEEN RHEUMATOID ARTHRITIS AND OSTEOARTHRITIS

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Introduction: Total knee arthroplasty (TKA) for rheumatoid patients has concerns for long term durability because of poor bone quality and joint laxity. The purposes of the current study were to evaluate the clinical outcomes over 15 years follow-up for rheumatoid arthritis (RA) and osteoarthritis (OA), and to compare the clinical outcomes and durability of a ceramic tri-condylar implant. Materials and methods: A total of 507 consecutive TKA were carried out using a ceramic tri-condylar femoral implant. The diagnosis was RA in 170 knees and OA in 337 knees. Clinical outcomes were assessed with the Knee Society scoring system. Kaplan-Meier survivorship was calculated to determine the cumulative survival rate. Results: The age at surgery was significantly younger in RA patients (62.3 years old) than OA patients (72.6 years old). The average Knee Society knee score improved from 41.6 to 93.6 in RA patients, and also improved from 37.3 to 92.2 in OA patients. The functional score improved from 29.1 to 42.0 in RA patients, and also improved from 40.8 to 50.4 in OA patients. The preoperative and postoperative function scores were significantly lower in RA patients. With revision for any surgery or radiographic failure as the end-point, Kaplan-Meier survivorship at 15 years was 89.4% in RA patients and 96.0% in OA patients (p = 0.079). Conclusion: Low friction rate and unique design of this ceramic implant might contribute to excellent long term clinical outcomes and durability for RA and OA patients.

Abstract no.: 48615 WHEN DOES THE KNEE FEEL NORMAL AGAIN: A CROSS SECTIONAL STUDY ASSESSING THE FORGOTTEN JOINT SCORE IN PATIENTS FOLLOWING TOTAL KNEE ARTHROPLASTY

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Patient satisfaction has become paramount in today's outcome driven healthcare environment. The ultimate goal of an orthopaedic surgeon is to have their patients forget that their knee has been replaced over time. The forgotten joint score (FJS) is a recently developed scoring system that assesses how natural the prosthesis feels following total joint arthroplasty. While the FJS has been extensively applied in populations with total hip prosthetics, less is known about the patients undergoing total knee arthroplasty (TKA). The purpose of this study is to investigate the temporal relationship between TKA and scores on the FJS to determine if the findings are consistent with forgotten knee prosthesis. We evaluated 380 patients after undergoing TKA using the forgotten joint score questionnaire (FJS-12). Scores were calculated for patients at different post-operative time periods (1 month (M)-75, 6 M-79, 12M-77, 24M-89, 36M-60). The scores range from 0-100, with a higher score indicating a more natural or "forgotten" joint. We performed an Analysis of Variance with the Kruskal-Wallis test for the scores at each time point the data was collected. Average FJS-12 post-operative scores were 39.84 ± 27.43 at 1 month, 59.81 ± 28.46 at 6 months, 73.28 ± 24.12 at 12 months, 78.31 ± 20.90 at 24 months, and 77.60 ± 23.11 at 36 months. Our data illustrates that patients tend to forget about their TKA after one year. After a slight improvement at 2 years, the scores tend to plateau and no further improvement is shown.

Abstract no.: 46499 FEMORAL SHAFT BOWING IN THE CORONAL PLANE HAS MORE SIGNIFICANT EFFECT ON THE CORONAL ALIGNMENT OF TKA THAN PROXIMAL OR DISTAL VARIATIONS OF FEMORAL SHAPE Seong-II BIN¹, Sung Mok OH¹, Jae Young KIM¹, Sungwook CHOI² ¹Orthopaedic Surgery, Asan Medical Center, Seoul (SOUTH KOREA),²The scripps Research, Jeju national university, Jeju (SOUTH KOREA)

Introduction: The aim of this study was to determine (1) variations in the shape of the proximal, middle, and distal femur in patients who had undergone total knee arthroplasty (TKA), (2) the preoperative relationship between these three parameters and the distal valgus cutting angle referenced off the femoral intramedullary guide (FIMG), and (3) whether there was any relationship between femoral bowing and variations in the shape of the proximal or distal femur in the coronal plane. Methods: 316 osteoarthritis patients who underwent primary TKA from 2009 to 2011 were examined. The femoral neck shaft angle (FNSA), the femoral shaft bowing angle(FSBA), and the mechanical lateral distal femoral angle(mLDFA) were measured to assess the shape of the proximal, middle, and distal femur, respectively. Results: The mean FIMG angle was 6.5± 1.3. The FSBA was the factor that showed the strongest correlation with this angle (P\0.001). The mLDFA showed only a weak correlation (P = 0.001), and the FNSA showed no correlation (n.s.). The FSBA showed a weak correlation with the mLDFA (P = 0.001), but was not significantly correlated with the FNSA (n.s.). Apparent femoral bowing was found in 42 (13.3 %) of cases. Conclusion: The FIMG angle was mainly influenced by femoral shaft bowing among femoral deformities in the coronal plane. Therefore, to increase the accuracy of distal femoral cut during TKA, it is necessary to confirm femoral deformities and to measure the FIMG angle preoperatively from coronal radiographs covering the whole femur.

Abstract no.: 46516 THE ROLE OF TIBIAL STEM EXTENSION IN PRIMARY KNEE ARTHROPLASTY TKA Stefan CRISTEA, Stefan CUCULICI, Roman POPESCU, Albert Stefan STANCU Emergency Hospital St Pantelimon – Orthopedic Department, Bucuresti (ROMANIA)

Introduction: In complicated cases of primary total knee arthroplaties TKA, a tibial stem extension can dissipate the stress levels reducing the risk of failure. Methods: We reviewed 107 primary TKA's using proximally cemented tibial components with stem extensions, short and long. Our indications for tibial stem extension in primary TKA were: varus - valgus deformity (more than 15°), osteoporotic bone structure, rheumatoid arthritis with osteoporotic bone structure, large tibial proximal preexisting defect, previous proximal correction osteotomy or callus deformity. Patients were reevaluated at an average of 3 years after surgery (2 to 7 years) clinical and imagistic. Results: Only 52 out of 107 tibial stem extension in primary TKA, had varus deformity, more than 15°, 28 had valgus deformity, 20 had severe osteoporosis, 4 rheumatoid arthritis with osteoporotic bone structure and 3 had previous proximal correction osteotomy or callus deformity. Radiographic evaluation reported 2 cases of tibial implant aseptic loosening. The average IKS pain and function scores at time of assessment were 85 and 83. Average range of motion was 110° at latest follow-up respectively. There were no radiolucent lines except for the 2 cases of loosening. There were signs of osteosclerotic bone around the stem in 45% of the cases. No knees had dislocation, polyethylene insert breakage, peroneal palsy, or infection. Conclusions: The role of tibial stem extension in primary TKA in complicated cases is to increase tibial stability. The stem length and diameter must be precisely chosen in a very careful planning to diminish the fail rates.

Abstract no.: 48809 LONG-TERM OUTCOME OF TOTAL KNEE ARTHROPLASTY IN PATIENTS WITH SEVERE LIMITATION IN FLEXION FOLLOWING POST-TRAUMATIC DEGENERATIVE ARTHRITIS

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The outcomes of Total Knee Arthroplasty in stiff knees are usually inferior to those carried out in mobile knees. Post-traumatic degenerative arthritis presents a unique challenge due to associated juxta-articular bony malunion, soft tissue contractures and adhesions with or without history of localized scars and infection. We retrospectively analysed the outcomes of 52 patients (52 knees) who had undergone TKA for secondary degenerative arthritis following old intra-articular (33 knees) and juxta-articular (19 knees) fractures. 41 patients had undergone previous open surgery for fracture reduction with or without fixation. The average age of the patients was 52.6 (42-64 years) and average follow-up of 5.6 (2-9.3) years. The arc of motion (AOM) pre-operatively was less than 500 in all the cases, average being 23.70 (150-500). Post-operatively, there was a significant improvement in the AOM to 82.60 (300-1000) (p<0.01). The KSS (Knee Society Score) score improved from a pre-operative mean of 38.4 + 6.2 to 65.4 + 11.8 (p<0.01) and the functional score improved from 41 + 5.3 to 63 + 9.8. Complications were seen in 11 knees (21.1%) including post-TKA stiffness (AOM<500) 3 patients, deep infection in 2, skin edge necrosis in 1. flexion contracture > 100 in 2 patients and component loosening in 1 and malposition in 1. The overall survival was 89% at 7 years. A quadriceps snip was required in 12 patients. Though the rates of complications are high, TKA in post-traumatic arthritis leads to significant improvement in the AOM and functional scores.

Abstract no.: 47722 COMPARISON OF FUNCTIONAL OUTCOME OF DISTAL END RADIUS FRACTURE TREATED WITH ILIZAROV TECHNIQUE VERSUS VOLAR LCP

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Introduction: Distal radius fractures accounts for 74% of forearm fractures. Prevalence is more among females, with progressive increase in age complications arises as osteopenia and osteoporosis become more prevalent. The most common trauma mechanism is falling over the outstretched hand. The characteristics of such fractures (trace location, possible joint involvement, comminution and degree of soft tissue injury) are directly related to the force of the trauma, wrist angle at the moment of the trauma and bone health. A randomised prospective study was undertaken to compare closed reduction and ilizarov fixation versus open reduction and internal fixation with volar LCP Materials and Methods: Patients with distal end radius fractures in age group of 50 years and above were recruited and randomly allocated into two groups, consisting 30 patients each. Group 1 patients were treated surgically by open reduction and internal fixation with volar LCP with whereas patients of group 2 were managed with closed reduction and ilizarov fixation. Follow up was done at 6 weeks, 3, 6,9,15 and18months,their radiographic assessment was done and other complications were evaluated. Finally, functional outcomes were assessed at final follow up visit using "Demerit point rating system of Gartland & Werley.Results:In group 1results were excellent 11 cases, good in5, fair6, poor 8 whereas In group 2 results were excellent in 19, good in 7, fair in 3 and poor in 1 case Conclusion: closed reduction and ilizarov fixation gave superior results as compared to Open reduction and internal fixation with volar LCP in management of distal end radius fractures in terms of union and function

Abstract no.: 47589 VOLAR LOCKING PLATE SURGERY FAILS TO ACHIEVE ANATOMIC ANGULATION AND LENGTH AFTER DISTAL RADIUS FRACTURE Rikke THORNINGER¹, Jan ROELFING², Daniel WAEVER¹, Mette Lund MADSEN¹, Lars Carl BORRIS³, Lise Loft NAGEL³, Mads HENRIKSEN³ ¹Regionshospital Randers, Randers (DENMARK), ²Aarhus University Hospital, Lystrup (DENMARK), ³Aarhus University Hospital, Aarhus (DENMARK)

INTRODUCTION: Recent studies question the clinical advantage and cost effectiveness of volar locking plates. Here, we reviewed the radiographic outcome of 576 distal radius fractures treated with volar locking plates. Our hypothesis was that volar locking plate surgery restores the anatomical -12 degrees of volar angulation and anatomical length of the radius. METHODS: 576 patients (median age 63, 78% women) were treated with 2 different volar locking plates over a period of 3.2 years by 64 surgeons. Three independent observers evaluated angulation and ulnar variance (>2mm) on the latest radiographs before surgery and postoperatively at 0 and 5 weeks. RESULTS: The mean angulation was -18.0 ±5.4 and 15.5 ±11.2 degrees for volarly and dorsally displaced fractures, respectively. After surgery, there was no statistically significant difference between volarly and dorsally displaced fractures and the type of plates. Immediately after surgery the mean angulation was -4.5 ±6.3 degrees. After 5 weeks the mean angulation of -3.9 ±7.0 degrees did not statistically differ from the immediately postoperative measurements, p=0.79. Thus, the anatomical angulation of -12 degrees was not achieved (p<0.001). The mean differences between the three independent observers were minor, ranging from 0.3-1.8 degrees at the different time points (p<0.05). Shortening of the radius (>+2mm ulnar variance) was still present in 13% (95%CI 10-16) after surgery. CONCLUSION: Contrary to common perception, volar locking plate surgery did not restore the normal anatomy in terms of volar angulation and radial length. The clinical implication is unclear, because functional outcome was not available.

Abstract no.: 46706 STUDY OF FUNCTIONAL OUTCOME OF DISTAL RADIUS FRACTURES TREATED WITH PERCUTANEOUS CANNULATED SCREWS

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Introduction: Distal radius fracture (DRF) is a common fracture. Nearly 16% of all the fractures treated by Orthopaedic surgeons are DRFs. These fractures are treated by various modalities like; Immobilization in a cast, closed reduction and percutaneous K-wire fixation with or without use of small external fixator, open reduction and internal fixation by plates and screws. We studied in our department, closed reduction and internal fixation with percutaneous cannulated screws. Aim: To evaluate the clinical, radiological & functional outcome of this modality of fixation. Material & Method: In this study 30 patients were selected based on Fernandez classification. Type 1,3&4 were included in this study. Type 2&5 were excluded. Closed reduction under image intensifier was done. The fracture was fixed with percutaneous 4mm cancellous cannulated screw. Fixation was done at the earliest within 5 days of injury. In type 3&4 fractures, additional 2.4mm cannulated cancellous screws were used. Mayo wrist Score was used to calculate the functional outcome of the study during follow up. Patients were followed up at 1, 3, 6 weeks, and 3, 6 & 12 months. Result: On Mayo wrist score, 90% fractures were good to excellent. Conclusion: Cannulated cancellous screw fixation is an effective method for fixation of extra-articular DRFs. It can also be used in conjunction with additional 2.4mm cannulated screw for selected intra-articular communicated fractures. This can be used in young as well as elderly patients. This is a minimally invasive procedure with minimum soft tissue dissection with excellent results.

Abstract no.: 46426 COMPARISON OF VOLAR VERSUS DORSAL SCREW FIXATION FOR SCAPHOID WAIST FRACTURES; A FINITE ELEMENT ANALYSIS

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Scaphoid bone fracture constitutes 60% of all carpal bone fractures. The most common type of scaphoid fracture according to Herbert classification is B2. When the decision is surgical fixation of the scaphoid waist fracture, in the second step surgeon should decide on the approach and screw placement. Screw fixation can be performed either open or closed through volar or dorsal approaches. Using a computational finite element model of a scaphoid osteotomy, we compared the efficiency of dorsal and volar screw fixation of scaphoid waist fracture. Total displacement of the fracture gap in volar fixation in all planes (x, y, z) was lower than dorsal fixation in total flexion and neutral positions and lower than control (no fixation) model in all positions. However, in total extension position, total displacement of the fracture gap in dorsal fixation in all planes was lower than volar fixation and control model. In each position, relative rotation of the fracture fragments around the longitudinal axis of the scaphoid bone was lower in volar fixation. According to our findings we suggest volar screw placement for scaphoid waist fractures because it provides better stability. If dorsal screw placement is preferred in scaphoid waist fracture, we suggest that scaphoid plaster should be made in extension position. We recommend that scaphoid plaster cast should be made in the neutral position for scaphoid waist fractures which conservative treatment is planned.

Abstract no.: 47708 INCIDENCE OF BILATERAL WIDENING OF THE SCAPHOLUNATE JOINT AND SCAPHOLUNATE ADVANCED COLLAPSE

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Introduction: A traumatic rupture of the scapholunate ligament may cause carpal instability and scapholunate advanced collapse (SLAC) with osteoarthritis. A study was conducted to find out how frequently widening of the scapholunate joint and SLAC were present and if it occurred in both wrists. If the main cause of scapholunate instability is traumatic, it is expected to find more unilateral than bilateral lesions. Methods Bilateral wrist X-rays were studied of 923 patients who were treated for wrist pain or trauma between 2013 and 2017. It was noted if a wide scapholunate gap was present, if there were signs of SLAC and whether this was present in one or in both wrists. Results X-rays of 565 women and 358 men were studied. Mean age of the patients was 46.5 (range: 13-94). Widening of the scapholunate joint was bilaterally present in 61 patients (6.6%) and unilaterally in 13 (1.4%). Of the 74 patients with uni- or bilateral widening of the scapholunate gap, 22 had osteoarthritis with a SLAC pattern in one or both wrists. Of the 22 patients with SLAC, only one did not have signs of scapholunate abnormality or SLAC in the contralateral wrist. Conclusion and discussion In the majory of patients with scapholunate dissociation and SLAC, both wrists are involved. This may indicate that scapholunate dissociation and the evolution to SLAC are caused by a congenital or degenerative disorder and not by a traumatic rupture.

Abstract no.: 47032 EVALUATION OF KIENBOKS DISRASE STAGE III TREATMET BY LUNATE EXSION AND SOFT TISSUE SPACER

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Background: Kienböck disease is defined by avascular necrosis of lunate with a predictable pattern of collapse, and degeneration. Different modalities of treatments are available to suit different stages of the disease and patients demands. Objectives: To evaluate outcomes of treatment of Kienböck disease (stage III) by excisional arthroplasty of lunate with soft tissue spacer. Methods: The study group comprised 21 patients with Kienböck disease stage III, through a period of 60 months. All patients were treated with excisional arthroplasty of lunate and soft tissue (Palmaris longus tendon) as spacer. Volar approach was used. Wrist range of motion, power grip and (DASH) score questionnaires were used to assess clinical outcomes. Results: The mean follow up period was 33.5 months. Mean Dash score system preoperatively was 38.49; postoperatively it became 6.84; Preoperative range of motion were severely limited, postoperatively ROM significantly improved with mean flexion/extension was 47.14/57.38 degrees, power grip measurements showed improvement with mean preoperative (146.66 mmHg) and mean postoperative (163.8mmHg). Conclusion: Excision of lunate with filling the void with coiled Palmaris longus tendon is a treatment option for stage III of Kienböck disease which results in pain relief and functional improvement.

Abstract no.: 48687 LONG-TERM OUTCOME OF TRAPEZIECTOMY WITH LIGAMENT RECONSTRUCTION AND TENDON INTERPOSITION VERSUS ARTHROPLASTY FOR THE TREATMENT OF RHIZARTHROSIS. Cláudia RODRIGUES, Luis Henrique BARROS, Sérgio FIGUEIREDO, João ESTEVES, Marta SILVA, Alexandre PEREIRA, Miguel TRIGUEIROS, César SILVA Centro Hospitalar do Porto, Porto (PORTUGAL)

Total arthroplasty emerged with the rationale that it could provide less instability and shortening that are usually associated with trapeziectomy. Nonetheless, literature doesn't support a superior outcome for this procedure and not much is known regarding implant survival. The present study aims to compare two surgical techniques: trapeziectomy with ligament reconstruction and tendon interposition(A) versus "ball and socket" arthroplasty(B). We performed a retrospective cohort study with a sample of 100 patients submitted to surgical treatment of rhizarthrosis between 2008-2012. Group A included 28 patients whereas 72 patients entered Group B. Patients were mostly female(n=90) and global mean age at time of surgery was 62.3±8.0 years(A - 62.8±10.2 vs B - 62.1±7.1). Groups were statistically identical on age, gender and Eaton-Littler rhizarthrosis classification(p>0.05). Postoperative functional assessment was performed with QuickDASH scale and one question was added:"1.Would you accept being submitted to the same procedure again?" Mean follow-up was 37.0±29.0 months and significantly higher for Group A(A:72.2±27.4 vs B:24.2±16.2;p<0.01). There were no statistically significant differences on QuickDASH score(A:median 6.8 vs B:median 7.8;p=0.600) and on the question regarding satisfaction. Complication rate for group A was 7.14%(n=2:adduction contracture) whereas for B was 14.5%(1 infection, 1 trapezium fracture, 4 dislocations, 3 loosening). The authors conclude arthroplasty is safe, with very good overall functional result and a low rate of complications, without statistically differences between groups. Arthroplasty is an excellent option mainly in patients older than 55 years, with low demand activities, because provide a faster return to daily activities, with great satisfaction.

Abstract no.: 46449

THE INFLUENCE OF SEX AND TRAUMA IMPACT ON THE RUPTURE SITE OF THE ULNAR COLLATERAL LIGAMENT OF THE THUMB

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Introduction: Sex- and gender-specific analyses have rarely been performed in orthopedic literature. The primary purpose of this study was to investigate whether for injuries of the ulnar collateral ligament (UCL) of the thumb the specific location of the rupture is influenced by sex. A secondary study question addressed the sex-independent effect of trauma intensity on the rupture site of the UCL. Methods: This is a retrospective analysis of all patients with a UCL tear treated surgically between 1992 and 2015 at two level-I trauma centers. Trauma mechanisms were classified into the categories: (1) blunt trauma, (2) lowvelocity injuries, and (3) high-velocity injuries. After reviewing the surgical records, patients were divided into three groups, depending upon the UCL rupture site: (1) mid-substance tears, (2) proximal ligament or bony avulsions and (3) distal ligament or bony avulsions. Dependencies between the specific rupture site and the explanatory variables were evaluated using chi-square test and logistic regression analysis. Results: In total, 1582 patients (1094 males, 488 females) met the inclusion criteria. Mean age was 41 years (range: 9-90 years). Taking into account the effects of sex on trauma intensity (p<0.001) and of trauma intensity on rupture site (p<0.001), mid-substance tears occurred more frequently in women, whereas men were more prone to distal ligament or bony avulsions (p<0.001). Conclusions: The results of this study demonstrate that both sex and trauma intensity exert an influence upon the rupture site in UCL injuries.

Abstract no.: 46723 INNOVATIVE METHOD OF TREATING COMMINUTED INTRA AND EXTRAARTICULAR PHALANX FRACTURE WITH LIGAMENTOTAXIS USING SINGLE K-WIRE

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Treating severely comminuted and intraarticular phalanx fractures are a surgical challenge. We describe a new method fixing these fractures with single intramedullary Kwire using the principle of ligamentotaxis. The objective of this study is to assess the clinical and functional outcome of the phalanx fractures treated with this innovative technique. Materials and methods: We describe in detail the method of placing snug fitting intramedullary K-wire in a distraction mode by parking the tip of the wire on the hard bone with illustrative examples. The prospective study included 18 cases of comminuted phalanx fractures treated with ligamentotaxis using single K-wire in the time of one year. 6 were intraarticular fractures and 12 were extraarticular. 16 cases were closed and 2 were open fractures. Cases were selected per inclusion and exclusion criteria. Cases were studied at regular follow ups up to 2 years. Results: Final evaluation of the patients was done at the end of two years. It was based on total active range of motion for digital functional assessment as suggested by the TAM and DASH score. Overall results were excellent in 85% and good in 15%. No complications were noted. No loss of reduction or shortening was found comparing the first and last X-rays. We conclude that ligamentotaxis using our method of interlocking is a simple, reliable and can be mastered easily by all surgeons with minimal inventory. Excellent patient outcome was obtained in comminuted intra/juxta articular phalanx fractures.

Abstract no.: 46892 THE RELATIONSHIP OF NEUTROPHIL-TO-LYMPHOCYTE RATIO AND MORTALITY IN TROPICAL DIABETIC HAND SYNDROME

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Introduction: The neutrophil-to-lymphocyte ratio (NLR) is an accessible laboratory parameter said to be predictive of mortality. Tropical diabetic hand syndrome (TDHS) comprises upper extremity infections affecting patients with insulin resistance in an equatorial climate. Objectives: In this retrospective cohort study, we reviewed NLR among TDHS patients and its association with mortality during admission and after discharge. Methods: Twenty-five hands from 25 consecutive patient referrals were enrolled from January 1, 2014 to December 31, 2015. Complete blood count upon admission and survival status after orthopedic management were collected and tabulated in a spreadsheet. Receiver operating characteristic (ROC) curve were used to assess the utility of NLR in predicting mortality. Results: Majority of the patients were males (76%) with a mean age of 50. The right side was affected most (56%). The mean neutrophil count was 78.36 and 13.96 for lymphocytes. NLR interguartile range was 8.10 with Q1 (<3.43), Q2 (3.44-9.33), Q3 (9.34-12.43) and Q4 (>2.43). In-hospital mortality was 52%, mortality in 6 months at 58%, and in 12 months at 100%. ROC value for admission mortalities was 0.939. mortality six months after discharge at 0.989, and in twelve months at 0.988, with findings statistically significant (p < 0.05). Area under the curve for all three specified times describe NLR as a good diagnostic tool. Conclusion: Patients with increased NLR have higher incidence of in-hospital mortality. Within one year, all TDHS patients expired. TDHS mortality can be attributed to NLR.

Abstract no.: 48285 OUTCOME ANALYSIS OF RADIOCARPAL DISLOCATIONS

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Introduction: Radiocarpal dislocations are complex injuries following high velocity trauma. Aim of our study is to compare the results in radiocarpal dislocations treated with only osseous fixation and those treated with both osseous and capsulo-ligamentous complex repair. Methods: Retrospective analysis of 14 patients with radiocarpal dislocations treated in our institution was done from January 2010 to December 2015. Average duration of follow up was 44.4 months. Patients who underwent only osseous fixations were included in group I (8 patients) and those who underwent osseous fixations and capsuloligamentous complex were included in group II (6 Patients). Functional outcome assessment included wrist range of movement, grip strength, Mayo wrist score and radiological assessment included Boumann index measurement, Scapho-lunate angle measurement and arthritis grading by Krink and Jupiter et al. Results: Average Mayo functional score of the entire study group was 72.5. Group II had higher functional score and flexion - extension arc compared to group I. In group I, 50% had carpal translation and carpal instability in the final follow up. Average Boumann's index was 0.78 and 0.88 in group I and group II respectively. Arthritis changes were noticed in 57% of entire study group. Incidence of arthritic changes in group I was higher than in group II. Conclusion: Radiocarpal dislocations involes injury to both osseous and capsulo-ligamentous complex. Treatment of radiocarpal dislocations with open reduction, internal fixation and ligament repair results in improved functional outcome.

Abstract no.: 47570 EPITENON SUTURE FIRST, FOLLOWED BY CORE SUTURE TECHNIQUE WITH A KNOT BURIED IN THE NATURAL SLIT OF THE DEEP FLEXOR TENDONS IN ZONE II FLEXOR TENDON REPAIR

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Introduction: Lots of current repair technique using a core suture followed by epitendinous suture result in enlargement of the tenorrhaphy, making passage of the tendons under this pulley difficult or even impossible. We describe our new surgical technique and their results. Materials and methods: Thirty five consecutive patients (mean age, 27 yrs; range, 18-45yrs) with Zone II flexor tendon injuries were retrospectively evaluated after our new surgical method. Firstly, running locking epitendinous suture was made using braided 4-0 VICRYL. Then a two strand core suture was made by Bunnel technique plus side loop technique using braided 3-0 polyester. Then a single core suture knot was buried inside the naturally existed slip of the proximal tendon stump of the flexor digitorum profundus. A volar splint without rubber band was applied. Post-operative exercise included simple passive mobilization since first postoperative day by the patient. Results: Average followup period was 8 months (6-12 mos). The total active motion (TAM) was 2450 ± 21 o . The Strickland method of assessment for surgical outcome showed excellent in 25 digits and good in 10 digits, with no fair or poor results. There was no rupture of repaired tendons at final follow-up. No second reoperation was needed. Conclusion: The epitenon first suture prevents slaving of the repaired tendon ends and minimizes traumatic handling during tenorrhaphy. Our new core suture technique enables early postoperative mobilization exercise without using rubber band or extension block brace, and smooth gliding of the repaired tendons without catching or triggering.

Abstract no.: 46990 FIXED ANGLE VOLAR PLATE - A BETTER IMPLANT TO GET BETTER FUNCTION AS COMPARE TO KWIRE FIXATION IN EXTRA ARTICULAR FRACTURES OF LOWER END OF RADIUS

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Introduction: Fractures of distal radius are the most common fractures of upper extremity with no clear guidelines for intervention. Our aim was to compare functional and radiological results of open reduction internal fixation with use of volar plate with percutaneous fixation for the treatment of extra-articular distal radius fractures, I. Methods: A prospective study was performed at our institution. 45 consecutive patients with extraarticular radius fracture treated with either K wiring (n = 21) or volar plating (n = 24) were analyzed. Clinical and radiographic assessments were conducted at end of six months after surgery. Outcome was analysed on the basis of range of motion, DASH scores and radiological parameters. Results: Patients in the plate group had superior DASH scores at six months. At six months the mean DASH score was 2.35 in plate group as compared with 5.20 in K wire group (p = 0.0431). Patients in plate group had greater range of motion than patients in K wiring group. K wire group had 6 complications (3 had pin tract infection, 2 had radial collapse, 1 had DRUJ subluxation) with respect to plate fixation group in which one patient had tensynovitis. Discussion: The fixed angle volar locking plate in extra articular fractures of lower end radius gives better functional outcomes as compared to k wire fixation. The plate provides a stable construct upto remodelling phase of fractures as compared to k wiring which are removed at 4-6 weeks and have potential to distort the fracture fixation.

Abstract no.: 47453 EXPERIENCE WITH WIDE AWAKE APPROACH IN HAND SURGERY

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With the busting of the "Epinephrine myth" the use of local anaesthetic mixed with adrenaline for administering digital blocks has phenomenally increased. It also offers advantages of a bloodless field which obviates the need to use a tourniquet. This allows most procedures to be done without regional blocks or general anesthesia which require in-patient admission and monitoring. Aim was to assess the efficacy of the wide awake approach in hand surgery and to record the complications. A retrospective review of records of all patients who underwent surgeries in the hand and forearm with wide awake approach was conducted. Data regarding type of surgery, quantity of local anesthetic used, duration of stay, were collected. Complications like need for conversion to other forms of anesthesia, gangrene of finger, sensory disturbances were noted. 36 patients were included in the study, 26 men and 10 women. 5 patients had trigger release, 6 had surgery for proximal phalanx fractures, 7 had flexor tendon repairs, 5 had tenolysis and 13 had extensor tendon repairs. None of the patients had developed any complication related to adrenaline. 2 patients who were undergoing flexor tendon repair in zone 5 required conversion to general anaesthetic. No other complications were present. In conclusion use of local anaesthetic with adrenaline for hand surgery enables the surgeon to use a wide awake approach which allows assessment of intra-operative movements without need for tourniquet usage. This avoids need for regional or general anesthesia which needs expertise, monitoring and is expensive.

Abstract no.: 46340 ELECTROPHYSIOLOGICAL EPIDEMIOLOGY OF CARPAL TUNNEL SYNDROME

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Introduction: Nerve conduction studies are used for the diagnosis of CTS. As the severity of CTS progresses, the compound muscle action potential of the abductor pollicis brevis (APB-CMAP) demonstrates progressively increased latency and decreased amplitude. In the most advanced stages, APB-CMAP finally becomes undetectable. Materials: Seven hundred forty-one hands of 496 idiopathic CTS patients whose latencies of APB-CMAP ≥4.5 ms were included. Patients had a mean age of 60.7 years. Results: The number of hands of women (561, 75.7 %) was statistically significantly higher than that of men (180, 24.3%). The number of dominant hands (421, 56.8%) was statistically significantly higher than that of non-dominant hands (320, 43.2%). In 245 patients with bilateral CTS, dominant hands had statistically significantly greater undetectable APB-CMAP rates (69 hands, 27.2%) than non-dominant hands (44 hands, 20.0%). The number of hands of patients aged 60-69 years was the highest (214 hands, 28.9%), and that aged 70-79 years had the highest undetectable APB-CMAP rates (29.7%). Conclusions: Women were three times more likely to develop CTS than men. This may be because estrogen plays a part in the development of CTS. Dominant hands tended to develop CTS and were more susceptible to progression than non-dominant hands. The cause of CTS may be related to overuse of the hand. The age distribution curve peaked in the sixties. The most serious CTS occurred in seventies. Therefore, age is also an important factor. A combination of these risk factors appears to contribute to the development of CTS.

Abstract no.: 47679 LARGE REGIONAL VARIATIONS IN INCIDENCE OF PHYSICIAN-DIAGNOSED CARPAL TUNNEL SYNDROME AND CARPAL TUNNEL RELEASE SURGERY IN SWEDEN

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From nationwide patient registry in Sweden we identified all individuals ≥18 years who had consulted a doctor at any hospital 2001-2009 and received CTS diagnosis (ICD-10 code G560) and those who had carpal tunnel release (CTR). We calculated incidence of CTS and CTR according to sex, age and county (21 counties); only first-time diagnosis/surgery included. All incidence rates shown are per 100,000 person-years with 95% confidence intervals (CI). During the 9 years, 108,699 persons (75,799 women, 32,900 men) were diagnosed with CTS at hospitals; incidence in women 232 (CI 230-233) and in men 104 (CI 103-105), peaking at 50-59 years in women and 70-79 years in men. Among the 21 counties CTS-incidence varied from 172 to 364 in women, and from 71 to 175 in men. Of all persons with hospital-diagnosed CTS, 65% had surgery; CTR-incidence in women 151 (CI 150-152) and in men 65 (CI 64-66), peaking at 50-59 years in women and 70-79 years in men. Among the 21 counties CTR-incidence varied from 106 to 251 in women and from 40 to 117 in men. Proportion of individuals treated with CTR was lowest in ages 18-29 (women 52%, men 52%) and highest in ages ≥80 (women 69%, men 73%). Among the 21 counties proportion of surgically treated varied from 53% to 81% in women and from 51% to 77% in men. We found large regional variations in incidence of CTS and CTR and proportion of CTS-diagnosed individuals treated with surgery, which should raise concern about health care equity.
Abstract no.: 46216 ACCURACY OF HIGH RESOLUTION ULTRASONOGRAPHY IN ESTABLISHING DIAGNOSIS OF CARPAL TUNNEL SYNDROME (CTS) Purnima AGGARWAL, Sudhir Kumar GARG

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Introduction: Nerve Conduction Studies (NCS) are considered to be the gold standard for establishing diagnosis of CTS. It is expensive, painful and not easily available. We present our experience with use of ultrasonography to establishes the diagnosis of CTS by demonstrating an increase in the cross sectional area of the median nerve. Material & methods: 50 asymptomatic patients, 25 male, 25 female, age 20-65 years, were evaluated to establish the normal cross sectional area of median nerve at the level of wrist by high resolution ultrasound (17-5 MHz linear probe). 50 symptomatic patients, 38 female, 12 male, with age varying from 32-68 years were similarly examined. 46 patients had bilateral and 4 patients had unilateral symptoms. All patients had idiopathic CTS and clinical diagnosis was made on the basis of history and positive Phalen's test and Tinel's sign. NCS was also done in first 25 patients. Results: The mean cross sectional area in asymptomatic patients varied between 5 to 7.3 mm2 whereas in symptomatic patients cross sectional area of median nerve varied from 8.4-16.5 mm2. In 24/25 symptomatic patients NCS also established the diagnosis of CTS. Conclusions: Ultrasonographic evaluation gives similar results to NCS in establishing the diagnosis of CTS. It is painless, inexpensive, easily available and can be independently used for confirming the clinical diagnosis of CTS. After comparing the results of NCS and ultrasonography in 25 patients and finding them to be equally accurate, we now on high resolution ultrasonography to establish the diagnosis of CTS.

Abstract no.: 47685 EXTENDED FOLLOW-UP OF A DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL OF LOCAL STEROID INJECTION IN CARPAL TUNNEL SYNDROME

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Local steroid injections (40 mg methylprednisolone or corresponding dose of similar steroids) are commonly used in carpal tunnel syndrome (CTS). Long-term efficacy is unknown. We conducted a randomized double-blind trial comparing 40 ma methylprednisolone, 80 mg methylprednisolone, and placebo (saline) in patients, 18-70 years, with primary idiopathic CTS and no prior steroid injections. During 2008-2012 we randomized 111 patients (37 in each group). One year after injection, carpal tunnel release on study hand had been done in 27 patients (73.0%) in 80-mg, 30 patients (81.1%) in 40mg, and 34 patients (91.9%) in placebo group. In 2016 we mailed 4 scales (CTS symptom severity, Disabilities of the Arm, Shoulder and Hand (DASH), SF-36 bodily pain, and treatment satisfaction) to all participants and reviewed their medical records. We compared rate of subsequent surgery with Chi-square test (primary outcome) and symptom-severity (1-5 scale) score change from baseline with analysis of covariance. All participants provided complete follow-up data. At 60-87 (mean 74) months after injection, 101 patients had undergone surgery (all done with patients and investigators assignmentblinded); 31 (83.8%) in 80-mg, 34 (91.9%) in 40-mg, and 36 (97.3%) in placebo group (p=0.047 for 80-mg methylprednisolone vs placebo). Mean symptom severity score change in 80-mg group patients with no surgery was 1.34 (SD 0.88), and in surgerytreated patients 1.53 (SD 0.90); adjusted mean difference -0.004 (95% CI -0.57-0.56, p=0.99). No statistically significant or clinically relevant between-group differences were found in any scale. Higher-dose local steroid injections in CTS may have small long-term benefit.

Abstract no.: 47506 POSTERIOR INTEROSSSEUS NERVE COMPRESSION SYNDROME AND HYPEREXTENSION FINGER INJURY FROM FOOTBALL – DECEPTIVE PRESENTATION

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20 year old gentleman presented to us as hyperextension injury to ring and little finger following playing football. He was unable to extend ring and little finger at metacarpophalangeal joint with some weakness involved in other finger extensions. He was able to supinate and flex his forearm. He did not have any associated injuries. Xray did not reveal any bony injuries. Focal MRI was done to rule out extensor tendon injuries and that was proved as negative. He had some tenderness over proximal elbow joint. Xray elbow revealed some cortical thickening around radial tuberosity. MRI revealed probably recent partial tear of biceps tendon at its insertion site of radial tuberosity. There was odema surrounding it which was compressing the posterior interosseus nerve which led to his symptoms. He had surgical decompression of PIN near the elbow and his symptoms are improving. Patients history and presentation was making us to focus more towards extensor tendon injuries. He did not give any previous history of injuries to suspect more proximal involvement. Routine examination led us to this finding and further imaging. Posterior interosseus nerve compressive neuropathy can be caused by repetitive pronation & supination movements, trauma, space occupying lesions, inflammation, iatrogenic reasons and also distal biceps partial or complete tear. Absence of any relevant information pertaining to distal biceps partial tear apart from MRI findings was posing us real diagnostic dilemma.

Abstract no.: 46448 AN INNOVATIVE REPAIR TECHNIQUE IN A TYPE III BONY AVULSION OF THE FDP TENDON.

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Introduction: The purpose of this study was to determine strength and failure characteristics of a newly designed repair technique based on a tension banding principle using a suture anchor implant in bony avulsions of the flexor digitorum profundus tendon. Material and Methods: Bony avulsion of the flexor digitorum profundus tendon was simulated in 45 fresh frozen distal phalanges from human cadavers. For biomechanical evaluation, three groups were formed allocating 15 specimens into each group. Bony avulsions were repaired with minifragment screws, transosseous sutures and the new technique using a suture anchor. All specimens were loaded cyclically from 2 to 15 N at 5 N/s for a total of 500 cycles. Samples were tested to failure at the completion of 500 cycles. Load at failure, load at first noteworthy displacement (>2mm), elongation of the system, gap formation at therepair site, and the mechanism of failure were assessed. Results: The new techniques' superior performance in load to failure (100 N), load at first noteworthy displacement (77.4 N), and gap formation (0.2 mm) at the fragment-phalanx interface was statistically significant. A slight decrease in elongation of the tendon-suture complex was observed, which indicated an improved rigidity of the new technique. No implant extrusion or suture rupture were recorded when using the new technique. Conclusion: This innovative repair technique shows biomechanical superiority when compared to other commonly used surgical repair techniques, particularly in consideration of an early passive mobilization protocol. Due to its subcutaneous position, reduction of complications can be expected.

Abstract no.: 46559 INJECTABLE COLLAGENASE VS. PERCUTANEOUS NEEDLE FOR DUPUYTREN CONTRACTURE FASCIOTOMY IN PROXIMAL INTERPHALANGEAL JOINTS: A RANDOMIZED CONTROLLED TRIAL Simon Toftgaard SKOV¹, Therkel BISGAARD², Per SØNDERGAARD², Jeppe LANGE² ¹Aarhus University Hospital, Silkeborg (DENMARK), ²Regional Hospital Silkeborg, Silkeborg (DENMARK)

Purpose: Collagenase clostridium histolyticum injection was introduced commercially as a treatment for Dupuytren contracture following initial phase-3 investigations in 2009 with promising results. However, the efficacy of injectable collagenase has not been prospectively investigated in a direct comparison to other active treatments of Dupuytren contracture with more than 1-year follow-up, despite a wide and increasing clinical use. Method: In this prospective, independent, open label, randomized controlled trial, (Clinicaltrials.gov; NCT 01538017), percutaneous needle fasciotomy was directly compared to injectable collagenase. Fifty patients with primary isolated proximal interphalangeal joint Dupuytren contractures were enrolled and followed for 2 years. The primary outcome was clinical improvement defined as a reduction in contracture by 50% or more relative to baseline. Secondary outcomes included: change in contracture, recurrence, adverse events, complications, patient satisfaction, and Disability of Arm, Shoulder and Hand questionnaire score. Results: Clinical improvement at 2 years was maintained in 7% of injectable collagenase patients (2 of 29) and 29% of percutaneous needle fasciotomy patients (6 of 21). Injectable collagenase led to more, mainly transient, complications, in 93% of patients vs. 24% of the patients treated with percutaneous needle fasciotomy, and lower patient satisfaction, 1 vs. 7 (0 worst, 10 best). No other differences were observed. Conclusion: This study provides evidence that injectable collagenase is not superior to percutaneous needle fasciotomy in the treatment of isolated proximal interphalangeal joint Dupuytren contracture in regard to clinical outcome, and it led to more, mainly transient, complications and lower patient satisfaction compared with percutaneous needle fasciotomy.

Abstract no.: 47578 LAMINOPLASTY FOR THE TREATMENT OF MULTILEVEL CERVICAL RADICULOPATHY ; CLINICAL OUTCOME

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Introduction: For multilevel cervical radiculopathy, most surgeons prefer posterior decompression and fusion. However, this approach has some complications, so we applied another surgical option of posterior approach, laminoplasty that is performed in cervical radiculomyelopathy. Methods: Between January 2010 and December 2016, 20 consecutive patients who underwent open-door laminoplasty for only multilevel cervical radiculopathy were reviewed in this study. The evaluation included the location and degrees of preoperative and postoperative pain using a visual analog scale. The evaluation of postoperation included assessment of the degree of radiculopathy based on a modification of the study of Sampath et al. Severity of pain was assessed on six-point descriptive rating scale, patient satisfaction was assessed on a five-point scale, neurologic outcomes were measured by sum of 5 symptoms, and functional status was assessed on four-point scale. And a numeric score was then applied for each evaluation. Results: The degree of pain was improved from 4.5 to 1.5 using an analog scale. Pain severity was measured between "mild" to "discomforting" (mean rating, 1.5). Patient satisfaction was measured between "satisfied" and "neither satisfied nor dissatisfied" (mean rating, 2.5). The number of neurologic outcomes was mean 1.5 and most of them were neck and shoulder discomfort. Functional status was measured between "most" and "all" (mean rating, 3.5). Conclusion: In the present study, clinical outcomes were improved for most of the multilevel cervical radiculopathy patients who underwent laminoplasty. This results suggest that cervical laminoplasty is the one of the additional surgical options for the multilevel cervical radiculopathy.

Abstract no.: 47737

DECOMPRESSION AND ATLANTOAXIAL JOINTS BONE GRAFTING FUSION FOR REDUCTION AND FIXATION TREAT ATLAS CANAL STENOSIS BY POSTERIOR APPROACH

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BACKGROUND: Atlas canal stenosis is a complex disease. We have developed a new technique decompression and atlantoaxial joints bone grafting fusion for reduction and fixation atlas and axis treat atlas canal stenosis by posterior approach with complete retention of the C2 nerve root. METHODS: A retrospective analysis of consecutive 29 patients treated with this technique was performed in our department between January 2015 and January 2016. All patients underwent plain radiography, computed tomography (CT) scanning, and magnetic resonance imaging (MRI) evaluation. The atlantodens interval (ADI) and space available for cord (SAC)were evaluated preoperatively and 5 days after surgery on sagittal reconstructed CT scans and MRI scans to evaluate atlas canal stenosis. JOA score was used to evaluate the neurological function preoperation and 3 months after operation. Fusion was assessed by the CT scans. RESULTS: 1 patient died of spinal cord injury complication. 28 patients were followed up for 17 to 21 months. No patient required re-exploration for failure of implant fixation. At the last follow-up, all patients had achieved fusion. ADI, and SAC were significantly improved in these patients compared to preoperative measurements (P < 0.05). Compared to preoperation, JOA score was improved in 25 patients (P < 0.05). No severe complications such as injuries of vertebrae artery, nerve root and spinal cord or aggravation of spine cord injury occurred. CONCLUSIONS: In this study, our operation technique could treat atlas canal stenosis by decompress posterior arch of atlas approach, fixation and fuse atlantoaxial joints retain cervico-occipital and C2 nerve roots.

Abstract no.: 46275 CAN MRI PREDICT DISC CALCIFICATION IN PATIENTS OF CERVICAL DISC HERNIATION WITH MYELOPATHY? – ITS CORRELATION WITH CT SCAN.

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Background: Presence of disc space calcification in Cervical Spondylotic Myelopathy (CSM) might alter the surgical strategy. MRI is the most common diagnostic tool for CSM. The aim of this study is to assess the sensitivity and specificity of MRI as a tool in predicting disc calcification in patients of CSM. Materials & Methods: A retrospective diagnostic single centre study of 43 patients of CSM from January2015 to October2016, with 80 levels of cervical disc herniation were prospectively studied. A three-point grading system for cervical disc calcification was developed (0=not calcified, 1=indeterminate and 2=definitely calcified) on the basis of the signal intensity change in T2W sagittal/axial, T1W sagittal/axial and STIR sagittal sequences. 3 Spine surgeons graded the MRIs in a blinded fashion. The specificity and sensitivity was assessed by calculating the inter-observer & inter sequence agreements and correlated with the CT scan. Result: 43 patients with 80 levels of disc herniation, with a mean age of 54.9 years (range 37-74) were included. CT scans showed 38 calcified(47.5%) and 42 non-calcified(52.5%) disc herniation. There was not much of agreement between the observers and inter observer kappa values showed no reliability (k=0.00-0.20) and the inter sequence agreements were poor (k=0.00-0.20) both in the calcified and non-calcified group. Conclusion: MRI scan cannot predict calcification in cervical disc herniation in patients with CSM, the inter-observer and intersequence reliability were poor and CT scan should be done to prove or disprove calcification in these patients and surgical planning can be altered accordingly.

Abstract no.: 47803 OPEN-DOOR LAMINOPLASTY FOR MULTILEVEL CERVICAL SPONDYLOTIC MYELOPATHY AND OPLL USING TITANIUM RECONSTRUCTION MINIPLATE AND SCREWS. Md Kamrul AHSAN¹, Mohammed Abdul AWWAL¹, Naznin ZAMAN²

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To review outcome of 25 patients who underwent open-door cervical laminoplasty. Records of 18 men and 7 women aged 35 to 78 (mean- 62.6) years were reviewed retrospectively. Four patients had 5 levels (C3-C7), 21 patients had 4 levels (C3-C6) decompression and 3 patients (12%) performed foraminotomies. A total of 104 laminae were opened, all of them were fixed with a titanium reconstruction miniplates. In 21 patients, a 20-hole titanium miniplate bent to the contour of a lamina was used and fixed into 4 laminae and 4 patients fixed in 5 laminae levels. In most patients, screw fixation was unicortical and no spacer or bone graft was used. Demographic and surgical data were collected and clinical outcomes were assessed with neck pain score, neck disability index and Nurick's grading. Outcome analysis was done using Odom's criteria. The mean followup was 1.8 years. Diagnoses were MCSM (n=20), OPLL (n=5).Mean estimated blood loss was 120 ml, mean surgery time was 153 min. Following Nurick's grading, 23 patients (92%) improved, 2 (08%) had the same Nurick grade. No intra-operative complications were noted and average hospital stay was 6.12 days. Significance improvements in overall NDI scores occurred at 1 year follow up (p<0.002). Radiographic evaluation showed an increase in the mean sagittal diameter from 12.2 mm at pretreatment to 18.3 mm post surgery. Two patients developed transient C5 palsy. Open-door Laminoplasty technique is safe, easy and achieves a good canal expansion and neurological recovery and can be used as an alternative treatment.

Abstract no.: 46532 FUNCTIONAL AND RADIOLOGICAL EVALUATION OF CERVICAL SPONDYLOTIC MYELOPATHY OPERATED WITH POSTERIOR DECOMPRESSION AND LATERAL MASS FIXATION- A MINIMUM TWO YEARS FOLLOW-UP

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Introduction: 'Functionally-normal' cervical lordosis is not only important for maintaining the posture of the neck but also to prevent various cervicogenic symptoms. A number of literature have reported that cervical lordosis of less than 20 degrees is responsible for cervicogenic pain. There is a controversy in the surgical management of cervical myelopathy; a few groups encourage only laminectomy or laminoplasty without fixation and others lay emphasis on lateral mass fixation along with the decompression procedures.In this study we have evaluated the radiographs and clinical outcomes after posterior cervical decompression and fixation in patients with cervical spondylotic myelopathy. Material and Methods: This retrospective study included 37 patients operated with posterior cervical decompression and lateral mass screw fixation with minimum two-year follow-up.All patients and their radiographs were analysed for epidemiological parameters, cervical lordotic angle and changes in European Myelopathy Score (EMS) and VAS score.Results: Average age of study population was 68 ± 8.3 years. The functionally normal cervical lordotic angle of 23.02 ±4.19 degrees was maintained in patients operated with lateral mass screw fixations along with laminectomy. The EMS and VAS score showed significant improvement in postoperative versus pre-operative stage (15.7versus13.6,p<0.05 and 8.1versus1.5, p<0.05). Three patients had postoperative C5 palsy which recovered completely. Two patients had expired within a few months after surgery due to associated co-morbidities. There was no neurological worsening noticed. Conclusion: Posterior cervical lateral mass screw fixation is important after decompression procedures to maintain functionally normal cervical lordosis. Fixation along with decompression should be encouraged simultaneously in order to prevent post-operative progressive cervical kyphotic deformity.

Abstract no.: 48486 UTILITY OF THE PEDICLE SUBTRACTION OSTEOTOMY FOR THE CORRECTION OF SAGITTAL SPINE IMBALANCE

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Introduction: Pedicle substraction osteotomy (PSO) in the lumbar spine is indicated in the treatment of large sagittal deformities of the lumbar spine. Substantial complications associated with PSO's include pseudarthrosis and mechanical failure. The purpose of the present study was to assess the complications of this procedure and the causes of mechanical complications. Methods: Fifteen patients aged between 38 and 79 years (mean age 63.8+/-12.82) were operated between June 2011 and September 2014 for sagittal imbalance by means of one-level PSO. Preoperative and postoperative value of radiological spino-pelvic sagittal parameters were measured. Clinical and radiological evaluations were conducted preoperatively and postoperatively at 6 months and 1 year. Clinical evaluation included intra- and postoperative complications. Results: Mean pelvic incidence was 54.86 ±11.82°. Lumbar lordosis (LL) was measured to 12.26 ±18.48° preoperatively and increased to 42.73 ±14.05° postoperatively (p<0.05). Mean gain of lordosis after PSO at index level (fig. 2), was calculated to 28 ± 11° [14-41°]. SVA decreased postoperatively from 93.46 ±36.69 mm to 61.73 ±38.68 mm (p<0.05). Several complications (n = 8), including 2 minor (one dural tear with no clinical consequences and one transient radicular deficit) and 6 major with reintervention were observed in our series. Conclusions: The main cause of mechanical complications was insufficient sagittal correction. To limit the risk of mechanical complications and to achieve a good sagittal balance, PSO must be associated with additional SPO's or a second corrective surgery to obtain a solid anterior fusion.

Abstract no.: 46568 SURGICAL PLANNING AND PATIENT-SPECIFIC RODS (PSR) IMPROVE CORRECTION OF SAGITTAL IMBALANCE IN ADULT SPINAL DEFORMITY (ASD)

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The purpose of the current study is to confirm the previously published pilot data, that application of surgical planning and use of PSR significantly improve correction of sagittal imbalance specifically at 1 year follow-up (1Y). Methods: multicenter retrospective case series; inclusion criteria: patients after surgical correction of ASD, age >21 years old, preoperative and postoperative (1Y) radiographic evaluation of sagittal alignment, in particular, true sagittal vertical axis (SVA) in relation to pelvic parameters. Patients with implanted PSR after planning of correction were considered as a case group; patients with implanted in-situ contoured rods during regular operation were considered as a control group. Data were collected in 2 medical facilities after local IRB approval: 1) Hôpital Privé (France), and 2) Colorado University Hospital (USA). The following treatment effects were identified at 1Y: 1) patients with SVA improved to normal < 50mm or still normal (sufficient correction); and 2) SVA still abnormal or become abnormal (insufficient correction). Metaanalysis with fixed effect modeling was applied to pool results of two facilities. Results: Total number of patients: 109; 50 (USA); and 59 (France); 93 cases, and 16 controls. In cases sufficient correction at 1Y was observed in 62.5% (France) and 70.5% (USA); the pooled rate was 65.0% (95%CI: 55.3; 74.4). In the control group, rate of sufficient corrections was significantly less: 37.5% (95%Cl: 17.9; 62.3), P=0.04. Conclusion: This novel approach of personalized therapy for spinal surgery presents promising results which need to be confirmed at longer follow-up, higher control group, and correlated with clinical outcomes.

Abstract no.: 46409 ANALYSIS OF RISK FACTORS FOR EARLY ADJACENT SEGMENT DISEASE UNDERWENT REVISION SURGERY WITHIN 5 YEARS AFTER LUMBAR SPINAL FUSION

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Introduction: There are many concerns about adjacent segment disease after lumbar spinal fusion. Of them, we analyze the risk factors about early adjacent segment disease(EASD) in patients who underwent revision surgery within 5 years from first operation. Methods: 657 patients underwent lumbar spinal fusion of 3 and less segment to treat degenerative lumbar disease. Among them, 137 patients underwent revision surgery within 5 years due to adjacent segment disease or previously followed more than 5 years were included in this study. Gender, age, fusion method, preoperative diagnosis, number of fusion segments and radiological measurements were analyzed. In radiological measurement, pre-& post-operative lumbar lordotic angle(LLA), pre-& post-operative fusion segment lordotic angle(FSLA), pre-& post-operative FSLA per level, correction of LLA, correction of FSLA, and correction of FSLA per level were estimated. Statistical univariate analysis was performed with the Chi-square test and multivariate logistic regression analysis was done by using SPSS 14.0. Results: There were 13 patients with revision surgery due to EASD. In univatiate analysis, the frequency of EASD was significantly high in cases where PLIF was more than PLF(P=0.023), correction of LLA was >15°(P=0.021) and correction of FSLA per level was >5°(P=0.049). In multivariate logistic regression analysis, the frequency of ESAD was significantly high in case where PLIF was more than PLF(odd ratio=17.866) and correction of LLA was >15°(odd ratio=19.282). Conclusions: PLIF and correction of LLA more than 15 degree increased risk of EASD.

Abstract no.: 47097 ROLE OF CARTRIDGE BASED NUCLEIC ACID AMPLIFICATION TEST, LINE PROBE ASSAY AND LIQUID CULTURE IN OSTEOARTICULAR TUBERCULOSIS

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Introduction: The data on Cartridge Based Nucleic Acid Amplification Test (CBNAAT ,GeneXpert) and Line Probe Assay (LPA) does not exist for osteoarticular tuberculosis, Hence we conducted this study to correlate Cartridge Based Nucleic Acid Amplification Tests (CBNAAT), Line Probe Assay (LPA) with proven (MRI observations and Histology) osteoarticular TB. Methods: 29 patients of spinal, bone and joint TB diagnosed clinicradiologically and on MRI were enrolled. The tissue obtained after aspiration/ surgical debridement was subjected for histology/cytology, CBNAAT, LPA and liquid culture. Results: 15 spinal TB patients were diagnosed by MRI based criterias, while 16 had histological diagnosis. 25/29 tissue samples were diagnosed tuberculosis by CBNAAT while 24 patients had LPA positive for Tuberculosis. One sample with positive CBNAAT was negative on LPA. 4 samples demonstrated resistance to Rifampicin on CBNAAT. LPA demonstrated resistance to Rifampicin and Isoniazid in three and only Isoniazid in one. Four patients who showed resistance to Rifampicin by CBNAAT, 3 showed resistance to both Isoniazid also by LPA. Only one patient showed resistance to only Isoniazid and sensitivity to Rifampicin in LPA. 1/29 sample was smear positive for AFB. None of the patients have shown any growth on liquid culture. Conclusion: Sensitivity for diagnosis of osteoarticular tuberculosis by CBNAAT was 86% and on LPA was 83%. The drug resistance for rifampicin was 14% while for INH 14%. CBNAAT and LPA are confirmatory for diagnosis of TB in few hours and able to demonstrate drug resistance for Rcin(CBNAAT +LPA) and INH (LPA).

Abstract no.: 47076 INDIVIDUAL COLLAGEN FIBRIL ALTERATION IN DEGENERATED DISCS

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The precise mechanism of intervertebral disc degeneration remains unrevealed, especially at the nanoscale. The purpose of this study was to determine the alternation of collagen fibrils in annulus fibrosus after degeneration and to discuss the intervertebral disc degeneration pathogenesis at the nanoscale. An intervertebral disc degeneration model was induced by combining bending moment of 40 degree and compressive loading of 1.8. 4.5 and 7.2N, respectively, on rat tails using an external fixation device. The structure and the elastic modulus of individual collagen fibril at nanoscale was examined two weeks after loading by the use of atomic force microscopy. The collagen fibrils altered from diameter of 170±18nm and elastic modulus of 0.86±0.12GPa in the intact annulus fibrosus, to diameter of 310±24nm (P < 0.001) and elastic modulus of 1.27±0.30GPa (P=0.003) on the concave side after bearing 7.2N. The collagen fibrils thickened and stiffened to various degrees in degeneration process, and displayed distinctions between the concave and the convex from the inner layer to the outer layer. In comparison, significant disorder and decrease of cell numbers in the annulus fibrosus after bearing loading were observed at the microscale from the hematoxylin/eosin staining, suggesting the induction of the structural rupture and functional depression of intervertebral disc. The results of this study indicated that the degeneration was not only associated with the disorder at microscale, but also the collagen fibrils alteration at nanoscale, leading possibly to changes in the mechanical and physiological environment around the annulus fibrosus cells.

Abstract no.: 47137 OXIDATIVE STRESS PLAY A ROLE IN THE PATHOGENESIS OF LIGAMENTUM FLAVUM HYPERTROPHY IN LUMBAR SPINAL STENOSIS PATIENTS

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Introduction: Lumbar spinal stenosis (LSS) is a disabling disease in the elderly. Hypertrophy of the ligamentum flavum is one of the important contributing factors in degenerative LSS. In this study, we aimed to study the role of oxidative stress in the pathogenesis of hypertrophic ligamentum flavum from degenerative LSS patients. Methods: We included 28 patients with degenerative LSS who were confirmed clinically and radiologically. Ten lumbar herniated intervertebral disc (HIVD) patients were also included as control group. Ligamentum flavum were obtained from the decompression procedures. The parameters of oxidative stress, free radicals and antioxidants, were evaluated to determine the role of oxidative stress. Besides, the histologic analysis, Trichrome and Alcian blue stains, were used to assess the degree of fibrosis and content of collagen fibers. We also examined the markers of epithelial-mesenchymal transition (EMT) in the ligamentum flavum. Results: Higher lipid peroxidation, nitric oxide levels and iNOS were found in ligaments from LSS patients compared with non-hypertrophic ligament tissue (p < 0.05). The levels of glutathione in ligaments from LSS patients were significantly lower when compared with non-hypertrophic ligament tissues (p < 0.05). Besides, the levels of glutathione were negatively correlated to the thickness of ligament from LSS patients (r = 0.7984). The histology showed severe fibrosis in the entire area of the hypertrophic ligamentum flavum. In immunohistochemical analysis, there were more expression of EMT-related proteins in the hypertrophied ligaments. Conclusions: The current results suggest that oxidative stress is also associated with ligamentum flavum hypertrophy in degenerative LSS.

Abstract no.: 48232 SPINE FUSION AND RHBMP IN A VITAMIN D DEFICIENT RAT MODEL

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Introduction: The effects of vit D deficiency on spinal fusion are not well studied, nor are approaches to overcoming the detrimental effects of deficiency. Recombinant Human Bone Morphogenic Proteins (rhBMP) are known to promote new bone growth and improve spinal fusion outcomes. Thus, rhBMP-2 may be able to overcome the potential negative effects of vit D deficiency on spine fusion. Methods: 45 Sprague-Dawley rats were divided into 3 groups: vit D Deficient (16), Rescue (15), and Sufficient (14). Posterolateral fusion was performed at L3-4/L5-6, with one level receiving rhBMP-2 and the other allograft. Immediately postoperative, the Rescue group was given a standard chow with vitamin D. At 6 weeks, the spines were harvested for microCT and histological analysis. Results: Serum vit D levels confirmed that (1) Deficient and Rescue g-roups had significantly lower serum vit D levels than Sufficient rats (p<0.001) and (2) postoperative Rescue resulted in vit D levels at 6 weeks that were comparable to Sufficient rats. In Sufficient rats, intact trabecular bone within the L5 vertebral body showed significantly greater trabecular thickness (Tb.Th; p < 0.001) and spacing (Tb.Sp; p<0.001) and bone volume fraction (BV.TV: p<0.001) than in Deficient and Rescue. BMP-treated fusions showed decreased Tb.Sp in Sufficient compared to Deficient rats (p < 0.05). Conclusion: Compared with vit D Sufficient groups, bone microarchitecture was diminished for Deficient and Rescue groups in intact bone. Fusion mass was substantive across groups, with improved microarchitecture in Sufficient rats and more robust fusion masses in rh-BMP2-treated groups.

Abstract no.: 48066 THE DIFFERENT EXPRESSIONS OF MATRIX METALLOPROTEINASES ACCORDING TO THE LOCATION OF DISCS IN THE PATIENTS WITH SEQUESTRATED LUMBAR DISC HERNIATIONS

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To evaluate the different expressions of matrix metalloproteinases (MMP) according to the locations of discs in the patients with sequestrated lumbar disc herniations. Summary of Literature Review: MMPs are considered to be the major catabolic enzymes in the intervertebral disc. MMPs have been known to be the primary mediators of ECM degradation, to play major roles in disc degeneration by changing on collagens and extracellular matrix, and to be involved in the processes of apoptosis and autoresorption of herniated disc materials by inducing the inflammatory cytokines. Materials and Methods: The sequestrated and contained disc materials were removed in seven patients with sequestrated lumbar disc herniations. The materials from contained discs were divided into group 1 and those of sequestrated discs were included into group 2. The immunochemistry tests were done for the tissues of both groups. The expressions of MMP-1, 3, and 13 were checked using fluorescence microscope. The amounts of expressions of each MMP were accounted by percentages of expressed cells and analyzed statistically. Results: In histological study, the increased expressions of MMP-1, 3. and 13 were found in group 2. In statistical analysis after quantification of expressions. the expressions of all MMPs were increased significantly in group 2 (p < 0.05). Conclusions: The increased expressions of MMP-1, 3, and 13 indicated that the inflammation and degeneration processes, and the spontaneous resorption by surrounding tissues were suggested to be more actively in the sequestrated disc than in the contained disc.

Abstract no.: 47500

A SINGLE MAGNETIC CONTROLLED GROWING ROD CAN DRIVE DOUBLE ROD GROWTH SYSTEMS WITH APICAL CONTROL IN EOS Simon Toftgaard SKOV¹, Sebastiaan P.J. WIJDICKS², Cody BÜNGER³, René M. CASTELEIN², Haisheng LI³, Moyo C. KRUYT² ¹Orthopaedic Department, Aarhus University Hospital, Silkeborg (DENMARK), ²Orthopaedic Department, University Medical Clinic Utrecht, Utrecht (NETHERLANDS), ³Orthopaedic Department, Aarhus University Hospital, Aarhus (DENMARK)

Introduction: The magnetic controlled growing rod (MCGR) application in severe early onset scoliosis has increased over the last years worldwide, as they allow non-invasive lengthening. Disadvantages of the MCGR are the high initial costs and lack of apical control. To overcome these, we combined a single concave MCGR with a contralateral sliding rod system with apical control. The aims of this study were to investigate the feasibility, 3D correction, spinal growth and complications of this new MCGR-hybrid principle. Methods: A consecutive series of patients from two European spine centers that were treated with the MCGR-hybrid principle was evaluated retrospectively. All the patients operated from 2014-2016 were included. Demographics and clinical parameters were recorded from patient files. Length, Cobb angle and rotation (Nash-Moe method), were measured on standard digital radiographs. Results: Eighteen patients with a mean age at treatment of 9.9 years with a mean follow-up time of 17 months. The frontal Cobb angle was reduced from mean 59 preoperative to 31 post-operatively and was maintained throughout follow-up. Rotation of the apical vertebra improved from mean 26 to 18. Kyphosis decreased and lordosis was largely unaltered. Instrumented spine growth was maintained at a mean 11mm/year. There were no technique or hardware related complications. Conclusion: These early results show satisfactory 3D correction and spinal growth maintained with only minor complications. Thus, this new single growth engine approach with apical control seems cost-effective in providing 3D correction and to maintain spinal growth in EOS.

Abstract no.: 47881 EXTERNAL FIXATION AS A «PARACHUTE TECHNOLOGY» IN THE HIGH-RISKY SPINE SURGERY

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Introduction. Ilizarov method is uncommon in spine surgery. Clinic experience of external fixation is usually limited by halo-pelvic traction. Some authors used external frames in scientific investigations. But in some high-risky cases some ideas taken from Ilizarov philosophy can become a «parachute technology». After active scientific research with external spine fixators on animals (1973-1993) the clinical usage of external spine fixation began in our center. This work is based on 20 years of practice in external spine fixation. Objective. To determine the role of external fixation in spine surgery. Material and methods. The analysis of 537 case histories of patients with external transpedicular and halo frames was made. All external frames were developed and made in Ilizarov Center. Most of the patients had huge deformities with high neurological risk. Another challenging group of patients had septic spine conditions. Results. We've got the biggest practice of external spine fixation in the world. This experience was used for the deep analysis of strategic and tactical mistakes. Strict indications for excellent application of Ilizarov method in spine surgery were determined. Conclusion. External spine fixation is a handy research tool. It is possible and effective to use it in some high-risky cases under very strict indications. A lot of complications can occur while using external fixation. The best results can be reached in combination of external frames with other types of spine fixators.

Abstract no.: 46608 SEVERE RIGID KYPHO-SCOLIOSIS IN KIDS – A DIFFERENT BALLGAME!!! CLINICO-RADIOLOGIC EFFICACY OF APICAL SPINAL OSTEOTOMY IN 32 PAEDIATRIC CASES OVER MID-TERM FOLLOW UP. Ankit PATEL, Vishal KUNDNANI Bombay Hospital & Medical Research Centre, Mumbai (INDIA)

Introduction: Apical spinal osteotomy (ASO) gives excellent 3-D deformity correction at apex with definitive advantages. Aim was to evaluate clinico-radiological efficacy of ASO in management of pediatric severe (>50°) rigid kyphoscoliosis due to varied etiologies. Methodology:32 patients (<12yrs) with fixed Thoraco-lumbar Kyphoscoliosis and having sagittal imbalance were operated with ASO. Clinico-Radiographic & intraoperative parameters documented. Sagittal balance-SVA & Kyphosis. Scoliosis Cobb's angles were recorded. Results:26 Patients (mean age 9) of 32 who underwent ASO (MST=244 mins; blood loss=337ml; LOS=8 days) for varied etiologies (Congenital=8, Post tuberculosis=7, Neurofibromatosis=5, Post traumatic=3, Scheuermann's kyphosis=1,AIS=2) satisfied minimum follow-up of 24 months. Average kyphotic angle improved from 96.50 to 30.70, average correction 68.57%. At last follow-up, average kyphosis was 35 (Mean correction 64.15%). Scoliosis angle improved significantly from 52.50 to 15.760, average correction 68.79%. At last follow-up, avg scoliosis angle was 19.420 (Mean correction 60.95%). Sagittal plane balance significantly improved (Pre/Post SVA =7.59/3.94 cm). Preoperatively, 9 patients had neurological deficits (Frankel C-5, B-3; A-1), with Frankel E in 17 patients which improved significantly at last follow-up (E-22, D-2, B-1, A-1). 1 patient developed new-onset Frankel A, which failed to recover at last follow-up. Complications included neurological deterioration-2 cases, dural tear-2, superficial infection -1 and implant failure-1 case needing revision. Conclusions: Satisfactory correction can be safely performed by Apical Spinal Osteotomy with a direct visualization of the circumferentially decompressed spinal cord. This technique is versatile and useful for reliable and safe correction of rigid kyphoscoliosis of varied etiologies. Key-words: Kyphoscoliosis, correction, rigid, pediatric, spinal osteotomy

Abstract no.: 46152 A COMPARISON STUDY OF THE SAGGITAL POSTURES BETWEEN THE SCOLIOTIC AND NORMAL POPULATIONS

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Introduction: Previous studies showed some sagittal spino-pelvic parameters among asymptomatic Chinese adults were different from Caucasian adults. However, the distribution of sagittal postural patterns among Chinese population was not specifically characterized, whether in asymptomatic or scoliotic group. The current research aimed to study the sagittal postures of scoliotic and asymptomatic populations and find their differences. Methods: 126 asymptomatic and 117 idiopathic scoliotic (IS) young adults were recruited. Their sagittal spinopelvic parameters were measured. The Roussouly type was then decided, as well as the relative position of C7 plumbline with respect to sacrum and hip axis. Comparison analyses were undertaken. Results: IS group had larger pelvic incidence, pelvic tilt and sacral slope, but a smaller spinal tilt than asymptomatic group (P<0.05). The distribution of Roussouly types was similar between asymptomatic and IS groups, of which 49.2% and 45.3 % belonged to Roussouly Type 3, respectively. Asymptomatic males and females had a similar distribution, which was different between the two genders in IS group (P<0.05), with more females possessing a well-balanced posture. Besides, more IS subjects had forward displacement of C7 plumbline than asymptomatic ones (P<0.05), while no difference between the two genders in either group. Conclusions: Though sagittal pelvic parameters were larger in IS population, their sagittal postural patterns were maintained and there was no sagittal postural pattern correlated with IS. The occurrence of anterior displacement of C7 plumbline was more common in IS patients than asymptomatic adults, but seemed not correlated with genders in the both populations.

Abstract no.: 46197 EVALUATION OF RELATIONSHIP BETWEEN SAGITTAL SPINO-PELVIC ALIGNMENT AND CHRONIC LOW BACK PAIN IN ADULTS Akshay LEKHI Santosh Hospital, delhi (INDIA)

Back pain is one of the commonest and most troublesome of complaints. The cause of low back ache has many contributing factors. One of the many aetiologies of back pain is mechanical back pain in which the mechanics of the affected spine is deranged or deviating from normal limits. Several studies have shown the importance of sagittal spinopelvic alignment for maintaining a balanced posture in the normal population. We did this research in our demographic area to study the correlation between chronic mechanical low back ache and sagittal spino-pelvic alignment. Aims and objectives The main objective is to correlate the variations in sagittal spino-pelvic alignment in our population with chronic low back pain. Materials and methods 150 patients with chronic low back ache were included in the study. Evaluation of the lateral view radiographs of lumbo-sacral spine with pelvis showing all parameters included in the study done at 0, 6 and 12 weeks of patient reporting to the hospital along with JOA (Japanese Orthopaedic Association) back pain evaluation questionnaire scoring at all follow ups. The Visual analogue scale was also evaluated at the first and last follow-up. Conclusion There is a definite relation between spino-pelvic alignment and chronic low-back ache. The sacral slope, pelvic tilt and pelvic incidence showed variations in the chronic low back pain patients that were statistically significant. The reverting back of some of the parameters over time, points towards the cause and effect relation between chronic low back pain and deranged spino-pelvic alignment parameters.

Abstract no.: 46796 A SIMPLE WAY TO SEE THE SCOLIOSIS IN 3D: THE VERTEBRA VECTORS PROJECTION IN HORIZONTAL PLANE.

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There is no enough information about the transverse plane appearance of scoliosis despite its 3D nature. The posterior-anterior vertebral vector is proposed for the visualization of the spine in the horizontal plane. The aim of this study is to highlight the importance of the information obtained from these vertebra vector-based top-view images in clinical practice. 136 normal, 714 non-operated and 95 operated scoliotic patients underwent in standing position simultaneous AP and lateral X-rays using the EOS-2D/3D system. In each case with SterEOS-3D software 3D surface vertebra reconstruction, then the vertebra vectors determination was carried out based on the 3D reconstruction. A vertebra vector starting point is in the middle of the interpedicular segment, running parallel to the upper plate, defining thus the posteroanterior axis of the vertebrae. Representing the vector's projection on each anatomical plans is possible, but we will focus on only the horizontal plane projection. For intact columns, the vertebra vectors aligned with the posteroanterior anatomical axis. It is a natural phenomenon when the vertebrae don't have an axial rotation. For scoliotic spine, the vector projections provide information about the frontal and sagittal curves, the lateral decompensation, the lateral displacement and the axial rotation of vertebrae. After surgery, it is possible to measure its effectiveness analyzing the parameters mentioned above. The use of posterior-anterior vertebral vector facilitates the understanding of the 3D nature of scoliosis. The approach used is simple. These results are sufficient for a first visual analysis, gives significant clinical information in the three anatomical planes.

Abstract no.: 46710 INDICATIONS RESULTS OF THE ANTERIOR APPROACHES IN THE IDIOPATHIC SCOLIOSIS

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Introduction The treatment has the goals are stopping progression of the scoliotic deformity and, controlled correction to ensure a balanced and fused spine. 2008.... 2016 /13 patients : 07 females 06 males /Mean age : 12,18 years CLASSIF. LI= 5 / LII = 0 / LIII = 2 / LIV = 1 / LV = 5 / CSVL : A = 3 / B = 7 / C = 1 SAGITTAL MODIFIER N+ 11 /N - 1 / ANGLE COBB F = 82° (64 — 121)/ BENDING COBB = 68,7° Results REDUCTION 17% / APPROACHES : 1 STAGE = 2 / 2 STAGES = 11 RELEASE : MEANS 4 LEVELS /TRACTION = 12 days (7 --- 21 days) AFTER Post approaches : POST OP COBB F =40,4 ° CORRECTION=49,26 % DISCUSSION The aim of the disc excision is to increase spinal flexibility and to improve correction by posterior instrumentation. only sparse data available assessing the effect of an anterior release on coronal flexibility in AIS the combined approach was mainly performed as a one stage . only two papers assessed the results after the anterior release in AIS patients: Wang et al. and Cheung et al. in our set the very satisfactory results obtained make us adopt this method conclusion indication criteria for the combined approach in AIS with the aim of achieving an optimal correction remains to be determined.

Abstract no.: 46551 QUALITY OF LIFE AND SAGITTAL ALIGNMENT AFTER SURGICAL CORRECTION OF ADULT SPINAL DEFORMITY (ASD) WITH POSTERIOR INSTRUMENTATION

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Study purpose: to compare long term patient centered quality of life (QL) treatment outcomes with change of spinopelvic alignment (SA) after surgical correction of ASD. Methods: multi-center prospective cohort study; inclusion criteria: Cobb angle $\geq 30^{\circ}$, age ≥21years old, indication for 4 or more operated levels; exclusion criteria: vertebral column resection; neuromuscular scoliosis; recent trauma; spinal cord abnormalities; pathologic obesity; osteomyelitis; pregnancy; and insulin dependent diabetes; follow-ups: 3, 6, 12, and 24 months; QL assessment: Oswestry Disability Index (ODI) and Scoliosis Research Society Scale (SRS22); SA indices: sagittal vertical axis (SVA); lumbar lordosis (LL); thoracic kyphosis (TK); pelvic incidence -LL mismatch (PI-LL); and pelvic tilt (PT); ANOVA was used for statistical analysis. Results: 54 patients were included (14 male); mean age, 62.1 (SD: 11.3), 22% had osteotomy; dropout, 18.5% at 24 month; preoperative mean ODI, 21.1 (SD: 7.5) and SRS22, 2.68 (SD: 0.9) were improved to 14.5 (ODI) and 3.64(SRS22) at 24 month follow up (P<0.0001); 95% of patients positively evaluated the treatment outcomes; preoperative mean values of SA were: SVA, 51(SD: 42); LL, 41 (SD: 19.1); TK, 45 (SD: 15.1); PI-LL, 15 (SD: 21.6); and PT, 23 (SD: 10.5), no significant changes were revealed postoperatively. Conclusion: significant improvement of the quality of life can be explained by correction of the spinal deformity, stabilization of spine, and effect of decompression. Sagittal alignment did not change significantly due to absence of preoperative imbalance in 50% of the enrolled patients.

Abstract no.: 46163 USING CONCAVE SIDE-BENDING RADIOGRAPHS COMBINED WITH DEROTATION TECHNIQUE TO DETERMINE THE DISTAL FUSION LEVEL IN IDIOPATHIC SCOLIOSIS PATIENTS UNDERWENT POSTERIOR CORRECTION WITH PEDICLE SCREWS: A PROSPECTIVE STUDY WITH MINIMUM 5 YEARS FOLLOW-UP.

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Introduction: No standard method for selecting the lowest instrumented vertebra (LIV) for the correction of adolescent idiopathic scoliosis with posterior all-pedicle screw instrumentations exists.Methods: a consecutive series of patients with adolescent idiopathic scoliosis (AIS) treated with posterior spinal fusion (PSF) at a single institution between 2007 and 2009 was identified. A total of 31 patients with AIS underwent PSF during this time period. Twenty-two patients with adequate imaging and a minimum 5-year follow-up. Cobb angle of the curve, lowest instrumented vertebra (LIV) tilt, disk angle below the LIV and trunk shift were measured on the preoperative and postoperative standing radiographs using a standardized method. Results: Thoracic curve improved from 35.8 degrees preoperatively to 11.2 degrees postoperatively, resulting in a mean correction of 68.7%. At last follow-up, thoracic curve remained at 11.8 degrees. Lumbar curve improved from 42.7 degrees preoperatively to 5.2 degrees postoperatively, resulting in a mean correction of 87.8%. At last follow-up, lumbar curve remained at 7.3 degrees. LIV was improved from 19.6 degrees preoperatively to 0.5 degrees postoperatively, and maintained at 0.7 degrees at last follow-up. The disk angle improved from 3.7 degrees preoperatively to -0.5 degrees immediately following surgery. At last follow-up, the disk angle had on average progressed to -6.9 degrees. Coronal balance also improved during the postoperative period from 9.22mm immediately following surgery to 2.97mm at the last follow-up. Conclusion: The method described was effective in obtaining satisfactory curve correction, adequate trunk balance, and preservation of motion segments.

Abstract no.: 48221 PELVIC INCIDENCE AND ITS RELATIONSHIP TO TOTAL HIP DISLOCATION IN PATIENTS WITH PREVIOUS LUMBAR SPINE FUSION Christopher KLECK, Philip YORK, Michael DAYTON, Craig HOGAN

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Introduction: Lumbar spine fusion has been shown to alter lumbopelvic mechanics, resulting in an inability to adequately alter sagittal alignment during normal activities. This has been shown to be related to total hip arthroplasty (THA) instability. Pelvic incidence (PI) has been shown to be an independent predictor of acetabular position and lower values are related to decreased acetabular anteversion following spinal deformity correction. We hypothesized that patients with lower PI would be at increased risk for postoperative dislocations. Methods: A 5 year retrospective analysis was performed to identify THA patients with preexisting lumbar fusions. PI measurements were calculated and compared between patients with (Group A) and without (Group B) postoperative dislocation. Results: Thirty-five patients with prior lumbar fusions underwent THA. Of these, 24 THAs in 23 patients met inclusion criteria, of which 9 were found to subsequently dislocate. The overall mean PI was 52. Group A had a mean PI of 45.2 degrees (Range 29-54) while Group B had a mean of 59.2 (range 42-76) (p = .005). Discussion: While previous studies have pointed to relationships between derangements in spinal alignment or motion and altered pelvic mechanics, the clinical impact of these reports has not yet been determined. Our hypothesis was that patients with lumbar fusions who undergo THA and subsequently dislocate may have a lower range of PI. Our findings suggest that patients with lower PI and prior fusion are less capable of maintaining a sagittal balance that accommodates a safe range of motion for their THA.

Abstract no.: 47682 DETERMINANTS FOR LONG-TERM OUTCOME AND HEALTH CARE UTILIZATION IN ADULT SPINE DEFORMITY SURGERY

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Purpose: The impact of adult spine deformity surgery on patients' health outcomes and postoperative health care utilization is currently unknown. Assessment of long-term impact of deformity surgery on pain, employment status, self-reported benefits, overall health, and consumption of health care services was our primary aim. Secondarily, we investigated the influence of specific surgical and patient-related factors on postoperative health improvement and extent of resource consumption. Methods: 123 patients, mean age 43 years, mean main Cobb 65° at index, were identified from our AUH-database. All had undergone 3D spine deformity correction between 1992-2009. Mean follow-up 8 vears(2-15). At follow-up three guestionnaires were used: LIVQS, DPQ and EQ-5D. Data on primary and hospital-based health care use were obtained from National Danish Registers. For all patients, health utilization data were available for six years preoperatively until the end of follow-up in 2011. Results: Perceived emotional-cosmetic improvements were reported at 40-77%. A 60% Cobb angel correction was maintained. Overall EQ-5D health score was significantly poorer(0.68vs.0.83) compared to age and gender matched controls. Primary sector utilization throughout follow-up rose steadily. Patients' surgical age and co-morbidity status displayed no significant differences in health care consumption. Education level was significantly associated with the variability in EQ-5D and hospital utilization. Conclusion: Adult deformity correction surgery provides maintained working status, improvement in the activity and pain levels, with low complication rates in all age groups. Independent factor (MLR) analysis determined poor education levels and unemployment to strongly increase health care consumption and even outweigh surgical complications.

Abstract no.: 46309

EGFL8, A NOVEL ANGIOGENESIS FACTOR OVEREXPRESSES IN OSTEONECROSIS OF FEMORAL HEAD AND PROMOTES ANGIOGENESIS VIA MAPK/ERK SIGNALING PATHWAY

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Objectives: Angiogenesis-osteogenesis couple plays a pivotal role in osteonecrosis of femoral head (ONFH) for necrosis absorption and bone remodeling. The property repair function of angiogenesis in the necrosis microenvironment is considered to depend on intercellular cross-talks under angiogenesis factors modulation. Methods: In this study, transfected EGFL8 COS-7 was used to measure the express of lysates and supernatant. ONFH rat model and patients, confirmed by micro-computed tomography (micro-CT) and histopathological examination, was used to evaluate the expression of EGFL8. Endothelial cell (SVEC) culture was used to examine the inhibitory effect of EGFL8 on vascular formation and SVEC migration. Real time PCR was employed to examine the effect of EGFL8 on the expression of osteoclast and osteoblast, the maker genes expression in micro-fracture model. The activities of JNK/p38/ERK and Akt was analyzed by Western blotting. Results and Conclusion: In this study, we showed that the modulated function of EGF-like domain 8 (EGFL8) in ONFH. EGFL8 is expressed in osteoblast lineages, and promotes endothelial cell activities. The protein expression of EGFL8 is significantly increased in vivo, the osteonecrosis sample of steroid-induce ONFH rat model. Also, high expression of EGFL8, both of gene and protein were seen in necrosis area of ONFH patients, followed by the penumbra and normal area. Addition of EGFL8 highly strengthen SVEC migration, promotes tube-like structure formation in vitro. Signaling modulation analysis show that EGFL8 induces the phosphorylation of MAPK/ERK. In summary, our results demonstrate that EGFL8 expressed by osteoblasts and osteoclasts improves endothelial cell activities through integrin-mediated signaling.

Abstract no.: 47437 MUSSEL-DERIVED BIOACTIVE PEPTIDES FOR DUAL-FUNCTIONALIZATION OF TITANIUM-BASED BIOMATERIALS ACCELERATE OSTEOINTEGRATION IN OSTEOPOROSIS RATS

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Specific cell adhesion and osteogenicity are both crucial factors for the long-term success of titanium implants, especially for osteoporosis patients. In this study, we aim to assess the effects of two mussel-derived bioactive peptides, capped with integrin-targeted sequence (RGD) or osteogenic growth peptide sequence (OGP), on the osteointegration of titanium-based implant in osteoporosis rats. At first, the surface of titanium screws was one-step biofunctionalized by treatment with RGD, OGP or RGD and OGP via robust catechol/TiO 2 coordinative interactions. Then, the screws with or without treatment were implanted into the overiectomized rats with osteoporosis. 8 weeks later, compared the screws without treatment, increased trabecular number and bone mineral density, more bone apposition at the bone-implant interfaces were observed in the femoral bones with the functionalized screws. More stable and greater pull-out strength was also displayed with the functionalized screws. The calcium and phosphorus contents were increased markedly on the surface of the functionalized titanium screws compared with the conventional titanium screws. Importantly, titanium screws functionalized with both RGD and OGP displayed an enhanced synergism on osteogenecity and showed better effects on osteointegration than those treated with either RGD or OGP. Thus, the dualfunctionalized titanium screws promote osteointegration at the bone-implant interfaces in osteoporosis rats.

Abstract no.: 47926 NATURAL COURSE OF LOCAL BONE MINERALIZATION AFTER USE OF A BIPHASIC BONE GRAFT SUBSTITUTE AS FILLING MATERIAL FOR CAVITARY BONE DEFECTS. A PROSPECTIVE EVALUATION USING SEQUENTIAL DEXA MEASUREMENTS

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Introduction: Mineral bone graft substitutes enjoy increasing popularity for a variety of indications, however little objective data, supporting their clinical efficacy, is available for most of these products. Dual-energy x-ray absorptiometry (DEXA) is an established method that allows non-invasive, objective and precise quantification of mineralization changes in the peripheral skeleton in a clinical context. Methods: We performed sequential quantitative bone-mineral-density (BMD)-measurements in a prospective cohort of 17 patients (F/M: 7/10, mean age 46 (17-69) years)) with 18 bone-defects, reconstructed with biphasic (60% calcium-sulphate/ 40% calcium-phosphate) bone-graft-substitute а (CERAMENT[™]|BONE VOID FILLER (BVF) or CERAMENT[™]|G) following intralesional curettage of benign bone lesions between July 2014 and March 2016. For comparison, additional control scans of the opposite extremity were performed after 1 year. Results are presented as mean (95% Confidential Interval). Results: The immediate post-operative BMD of 2.59 (2.2-3.0) g/cm2, subsequently decreased by 35% (18-51%) at 2 weeks; 40% (30-49%) at 6 weeks; 44% (33-54%) at 3 months; 49% (38-59%) at 6 months; and finally plateaued at 49% (37-60%) at 1 year. When compared to corresponding areas in the contra-lateral extremity one year post-operatively, BMD-values remained 26% (4-47%) higher on the operated side (p=0.012). Conclusion: BMD decreases rapidly during the initial 2-6 weeks after bone-defect reconstruction with this particular bone-graft substitute (CERAMENT™), which is likely due to expected resorption of its calcium-sulphate component. During subsequent months, BMD-decrease gradually decelerates and appears to subside one year post-operatively, with focal BMD-levels remaining at least equal to or higher than the non-operated side.

Abstract no.: 48273 RAPID PROTOTYPING SYSTEM: DEVELOPMENT OF BONE SCAFFOLD INTEGRATED WITH TISSUE ENGINEERED CELLS

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Introduction: The goal standard treatment for bone defect is the placement of autologous bone graft. This technique, however, causes morbidity in terms of pain, hemorrhage at the operation site and risk of nonunion at graft site. This study aimed to develop a scaffold embedded with bone growth stimulating agent that results in comparable or even better bone healing than the gold standard tricortical autograft. Methods: This was an experimental study using a sheep as model for treatment of critical sized defect. Comparison was made between 3 control sheep (Autologous bone graft) and 3 subject sheep, both which 3cm critical sized defect was made on its left tibia with later implanted with tissue engineered bone (TEB) with autologous plasma and marrow derived stem cells stabilized with biplanar external fixator. Results: Union was noted at the interfaces of the graft radiologically and histologically. Biomechanic test was performed at these interfaces and scaffold sample showed comparable result with autologous bone graft. The hallmark of this study is the invention of dual density scaffold by hydroxyapatite (HA). Outer dense layer provides the mechanical stability and the inner porous layer facilitates vasculature in promoting osteogenesis thus providing an alternative method to treat critical size bone defect. Conclusion: dual density hydroxylapatite scaffold is an alternative bone substitute to treat bone defects. In future more sample, longer duration of keeping the graft at the bone and randomized control trial needs to perform to favour this technique. Keywords: hydroxylapatite scaffold, tissue-engineered cell

Abstract no.: 47823

HUMAN ADIPOSE-DERIVED MESENCHYMAL STEM CELLS IMPROVE OSTEOARTHRITIS VIA ANTI-INFLAMMATORY AND CARTILAGE-RESTORING ACTIVITIES IN RABBITS

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Osteoarthritis (OA), a chronic age-related disease characterized by the slowly progressive destruction of articular cartilage, is one of the leading causes of disability in elderly people. In the present study, the anti-osteoarthritis effects of human adipose-derived mesenchymal stem cells (hADMSCs) and underlying mechanisms were investigated in a rabbit experimental OA model. Anterior cruciate ligament transection (ACLT) surgery were performed in adult male New Zealand white rabbits, and 8 weeks later, hADMSCs (1.7 x 106 or 1.7 x 107 cells) was injected into the injured knees alone or in combination with intra-articular injection of thrombospondin 2 (TSP2, 100 ng/knee) 3 times a week. OA progression was monitored by gross, radiological, and histological examinations. At eight weeks after cell transplantation, rabbits treated with hADMSCs or TSP2 alone exhibited lower degree of cartilage degeneration, osteophyte formation, and extracellular matrix loss. Notably, such cartilage damages were alleviated further by a combinational treatment with hADMSCs and TSP2. In addition, synovial inflammatory cytokines including interleukin-1 β (IL-1 β), IL-6, IL-8, and tumor-necrosis factor- α (TNF- α) were markedly decreased following the combinational treatment. Separately, it was confirmed that the transplanted hADMSCs attached on the injured cartilage surfaces after intra-articular injection. TSP2 induced chondrogenic differentiation of hADMSCs in vitro via Notch3/Jagged1 signaling and potentiated the therapeutic effects of hADMSCs in vivo. Taken together, the results indicate that hADMSCs improve OA via anti-inflammatory and cartilage-restoring activities and TSP2 augments the hADMSCs' potential. Keyword: Osteoarthrits, anterior cruciate ligament transection, human adipose tissue mesenchymal stem cell, thrombospondin 2, Notch signaling, cartilage regeneration

Abstract no.: 47740 A STUDY OF CARTILAGE CHANGES IN KNEE OSTEOARTHRITIS BY SYNCHROTRON-BASED TECHNIQUES

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Osteoarthritis (OA) is characterized by degeneration of articular cartilage. Method: This study investigated the changing of biochemical components of cartilage in control and OA infrared people. using Synchrotron-based techniques by fourier transform microspectroscopy(FTIR). The samples were collected from ACL reconstruction as control and TKA patients as OA, in both sexes, and separated into 3 groups of age 20-40, 41-60 and 61-90 years old. Result: amide I in the cartilage was decreased in 61-90 year-old group (0.2070 ± 0.0027) compared to 20-40 year-old group (0.2154 ± 0.0009). On the other hand, proteoglycan significantly increased in 41-60 years-old group (0.0377 ± 0.0045) when compare to 20-40 years old group (0.0105 ± 0.0012). Amide II/amide I ratios was observed to be significantly higher in the articular cartilage in 41-60 years-old group (0.5098 ± 0.0096) and 61-90 year-old group (0.4522 ± 0.0291) when compared to 20-40 year-old group (0.3962 ± 0.0058). The subchondral bone of both OA people (0.0906 ± 0.0024) contained lower levels of amide II than that from normal people (00972 \pm 0.0035) and also amide III (0.0093 ± 0.0004) in OA (0.0101 ± 0.0003) in normal people. Discussion:OA also involved in the changing in orientation of collagen fibrils network and structural changes in terms of amide I alpha helix and amide I beta. By employing a synchrotron techniques, an evidence of osteoarthritis of human knees caused by different amide I II III and proteoglycan is clearly addressed. FTIR microspectroscopy has introduced novel method to study chemical composition distribution of biological components.

Abstract no.: 48038

COMPARATIVE EVALUATION OF THERAPEUTIC EFFICACY OF MESENCHYMAL STEM CELL AND CHONDROCYTE APPLICATION IN EXPERIMENTAL GROWTH PLATE INJURY MODEL IN RABBITS

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This study aimed to compare monolayered allogeneic mesenchymal stem cell (MSC) sheets and chondrocyte cell sheets fabricated in temperature-responsive culture dishes for the treatment of an iatrogenically created proximal medial physeal tibial defect in New Zealand White rabbits. It is the fist study to compare MSC and chondrocyte cells for physeal arrest treatment. Following excision of the bony bridge, animals in treatment group 1(n = 6) were implanted with allogeneic chondrocyte cell sheets, animals in group 2 (n = 6) received allogeneic MSC sheets in the damaged area, and animals in group 3(n=6) were left untreated to serve as controls. The rabbits were sacrificed eight weeks after transplantation. Outcomes were evaluated by morphometry as well as histological (H&E and Alcian blue/safranin O).immunohistochemical (addrecan. SOX9). and immunofluorescence (GFP) staining. We observed significant differences between pre- and post-treatment measurements in groups 1 and 2 as the varus deformity improved, but not in group 3. Moreover, in groups 1 and 2, transplanted cells maintained their viability and differentiated into growth plate cartilage. We conclude that implantation of monolayered chondrocyte and MSC cell sheets provides an alternative treatment for physeal arrest that overcomes several disadvantages (cell migration, vitality problems) of conventional cell implantation procedures. The financial support was provided by the Scientific and Technologixal research Council of Turkey under R&D programme project No. 114S152.
Abstract no.: 46704 SUSTAINED DELIVERY OF GROWTH FACTOR USING ABSORBABLE SUSTAIN SCAFFOLD ENHANCES TENDON-TO-BONE HEALING IN A RABBIT MODEL

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Introduction : For anatomical restoration of repaired rotator cuff, the adequate effect of growth factor is essential. We aimed to applicate TGF-b using alginate-binding delivery system to the supraspinatus tendon-to-bone repair sites in rabbit model and evaluated the effect for rotator cuff healing using histological and biomechanical outcome. Method : The study used 60 adult female New Zealand White rabbits, with an average age of 16 weeks and an average weight of 2.5-3.0 kg. The rabbits were randomly divided into 3 groups: group 1, supraspinatus (SSP) repair only, group 2, the SSP repair with single TGF-b injection, and group 3, SSP repair with alginate-binding delivery system containing TGF-b. Biomechanical, and histologic analyses were performed 3weeks and 12 weeks after the index rotator cuff surgery. Results : At 12 weeks, biomechanically, cross sectional area of repaired tendon was 98.64%, 101.28%, 110.84%, and group 1 exhibited larger cross sectional area and ultimate failure load. Histologically, total Bonar score was 5.00, 6.12, and 7.50. Group 1 had significant more good results in tenocyte , ground substance, collagen component. Conclusion : Sustain release of growth factor using alginate-binding delivery system might have the possibility to improve tendon healing after cuff repair.

Abstract no.: 46762 BIOMECHANICAL PROPERTIES OF DIFFERENT PLATE CONFIGURATIONS AND FIXATIONS FOR DISTAL HUMERUS FRACTURES: A SYSTEMIC REVIEW AND META-ANALYSIS

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Objective: Distal humerus fractures are complex injuries that are particularly challenging to treat. The open reduction and internal fixation of these fractures is challenging and the fixation methods are various. Biomechanical studies have shown inconsistent mechanical strength using different implant configurations and fixations for distal humerus fractures. We therefore performed a systemic review and meta-analysis of biomechanical studies on the fixation of distal humerus fractures. Methods: A literature search was conducted utilizing three online databases considering biomechanical testing of different fixation technique for distal fibular fractures. A systemic review and meta-analysis was performed on the common biomechanical outcome measures: axial, sagittal, coronal, torsional stiffness, and failure load/torque. Results: In a total number of 31 studies with 16 different fixation techniques were identified. Of these studies, 15 compared parallel plating with orthogonal plating. In both supracondylar/intercondylar fractures, there are statistically significant greater mechanical strength in the parallel plates in axial stiffness, posterior bending failure load than in orthogonal plates. In supracondylar fracture, posterior bending stiffness is significantly greater in parallel ones. There were no significant difference between the two configurations for failure torque, anterior bending stiffness, medial stiffness. lateral bending stiffness torsional stiffness bending in both supracondylar/intercondylar fractures and posterior bending stiffness in intercondylar fractures. Conclusions: In this study, parallel and orthogonal configurations are mostly used fixation methods. Parallel plates provide greater biomechanical strength in axial stiffness, and failure load than orthogonal plates in both supracondylar/intercondylar distal humerus fractures. Parallel plates have better posterior bending stiffness in supracondylar fractures.

Abstract no.: 46438

THE EFFECT OF HUMERAL-FENESTRATION DIAMETER IN OUTERBRIDGE-KASHIWAGI ARTHROPLASTY ON THE STRENGTH OF THE DISTAL HUMERUS - A CADAVERIC BIOMECHANICAL STUDY Chih-Kai HONG¹, Ming-Long YEH², I-Ming JOU¹, Cheng-Li LIN¹, Chih-Hsun CHANG³, Wei-Ren SU²

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Background: Outerbridge-Kashiwagi ulnohumeral arthroplasty is an effective method in treating elbow osteoarthritis for young patients and athletes; however, distal humerus fracture after surgery can become a critical issue. A previous biomechanical study has showed that the maximum strength of the distal humerus decreases after a fenestration; however, the size of the fenestration hole has not yet been discussed. We hypothesized that distal humeri fenestrated with larger holes do not have significantly lower maximum strength. Methods: 24 fresh-frozen cadaveric distal humeri were obtained. Two drill sizes were chosen for fenestration: 12mm and 15mm in diameter. Two directions of force were applied with a materials testing machine for biomechanical testing: 5-degree flexion for axial loading and 75-degree flexion for anterior-posterior (AP) loading. Each specimen randomly received one of the two fenestration sizes, and force directions. All specimens were loaded to failure at a rate of 2mm/min. Findings: The failure loads of the 12mm and 15mm groups were not significantly different in either axial loading (mean 3886(SD 1271)N vs mean 4286(SD 901)N) or AP loading (mean 2303(SD 803)N vs mean 1897(SD 357)N). All specimens loaded with axial force failed via the fenestration holes; however, during AP loading, some specimens failed through the fenestration holes while others at diaphysis(p= 0.28). Interpretations: The maximum strengths of distal humeri with either 12mm or 15mm fenestration holes were not significantly different in Outerbridge-Kashiwagi arthroplasty. As the risk of distal humerus fracture is not exacerbated, a larger-size fenestration hole would help increase the surgery effectiveness.

Abstract no.: 48722 TREATMENT OF MRSA INDUCED BIOFILM FORMED ON METAL IMPLANTS BY BACTERIOPHAGE COCKTAIL THERAPY - AN EXPERIMENTAL STUDY

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Back ground :Biofilms are aggregates of microorganisms embedded within the selfproduced matrix of extracellular substances. Biofilms are of serious concern especially related to artificial devices. The bacteria in biofilm state become 10 to 100 times more resistant to antibiotics due to poor penetration. Orthopedic implants related infections are often associated with biofilm formation and mostly due to Staphylococcus aureus. Objective : Bacteriophages are known to penetrate the biofilm and are able to lyse the bacteria which are multidrug resistant, in our study we decided to look into the effect of bacteriophage therapy in vivo on biofilms formed on stainless steel K-wires by MRSA. Subject : For in vivo study, MRSA biofilm containing K-wire were implanted at the proximal end of ulna of both the limbs of 12 rabbits. Method : While 6 rabbits of experimental group were given local injection of cocktail of 3 different bacteriophages, the 6 rabbits belonging to control group did not receive any kind of therapy. Rabbits of both groups were monitored for up to 8 weeks. One K-wire was removed from each limb sequentially at the interval of 1 week and evaluated on the basis of clinical, radiological, microbiological, histopathological examination. Results : Control group rabbits usually showed either death or continuation of infection with the presence of biofilm. However, phage therapy group showed cure of the infection as removed k wire were found sterile. Conclusions : Thus, findings suggest definite role of bacteriophage therapy in treatment of biofilm formed on metal implants by MRSA.

Abstract no.: 47458 BIORESORBABLE RARE–EARTH-FREE MAGNESIUM SCREWS USED FOR OSTEOSYNTHESIS IN A SHEEP MODEL

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Conventional orthopaedic implants manufactured from steel or titanium (Ti) frequently develop complications such as loosening or inflammation. Biodegradable magnesium (Mg) is a promising alternative material, as it displays mechanical properties similar to bone. Furthermore, Mg dissolves gradually after implantation, which may support the healing process and renders removal operations obsolete. Until now, the rapid degradation of Mg in vivo has prevented wide-spread clinical application, although a novel alloy of Mg, zinc (Zn) and calcium (Ca) shows promising results. This study evaluated fracture healing in the presence of a degrading Mg-Zn-Ca implant in an in vivo sheep tibia model. Furthermore, degradation, gas evolution and changes in the bone-implant interface were examined. Fracture stabilization and healing were found to be comparable to gold standard Ti osteosynthesis. Within 12 weeks of application, use of the biodegradable screw in the physis led to implant breakage which may have been caused by the growth process of the tibia. However, tibiae treated with Ti screws were shorter than tibiae within the Mg group. For transepiphyseal application, the Mg implants may therefore be beneficial for growing skeletons. Increased bone mass was found at the very tight boneimplant interface, which may lead to increased mechanical stability for the Mg screws. In conclusion, the resorbable implant showed homogeneous degradation and moderate hydrogen gas formation, which did not damage the surrounding tissue or disturb healing.

Abstract no.: 46746 UNPLANNED 90-DAY READMISSIONS IN A SPECIALTY ORTHOPAEDIC UNIT- A PROSPECTIVE ANALYSIS OF CONSECUTIVE 12729 ADMISSIONS

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Introduction: Unplanned readmissions are an undesirable and expensive outcome of clinical practice. Previous reported literature is limited by retrospective study designs and 30 day study intervals. We analyzed causes for 90-day unplanned readmission, temporal occurrence of major causes, possible predisposing factors, bed days lost and economic impact. Methods: A prospective analysis of 12729 admissions was performed over 1 year in an Orthopaedic unit. Consecutive readmissions for any unplanned circumstances within 90 days of discharge following the index procedure were included. Polytrauma, open injuries, primary osseous infections and planned readmissions were excluded. Results: We noted an overall 90-day readmission rate of 2.07% and subspecialty rate of 1.43%, 3.32%, 2.9% in trauma, spine and total joint arthroplasty (TJA) respectively. The leading cause was surgical wound complications accounting for 131/264 (49.62%) readmissions. This was followed by readmissions for medical causes (trauma -18.37%;TJA -27.5%) and aseptic pain(spine-31.6%). Though 87.1% of superficial surgical site infections (SSIs) occurred within 30 days, 21.1%, 41.2% and 60% of the deep SSIs in spine, trauma and TJA respectively occurred beyond 30 days. The financial burden amounted to INR 1,01,55,770 (\$151,936) with a mean of 7.6 bed days lost per readmission. Age \geq 70 years, length of stay \geq 10days, female gender, health insurance and co-morbid illnesses had a significant association with 90-day readmissions. Conclusions: Our study showed that limiting analysis to 30 day unplanned readmissions would lead to failure in identification of 34.85% of readmissions especially deep surgical site infections in TJA and trauma.

Abstract no.: 46637 ASSESSMENT OF PLATELET FUNCTION IN PATIENTS ON ANTIPLATELET THERAPY WITH PROXIMAL FEMORAL FRACTURES TREATED BY OSTEOSYNTHESIS AND ITS INFLUENCE ON INTRA- AND POSTOPERATIVE BLEEDING

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Background: Treatment of proximal femoral fractures in elderly patients is challenging, especially if they are treated by anti-platelet-therapy (APT). In order to determine the best timing for surgery in patients on APT, platelet function can be quantified by analyzers like the Multiplate Analyzer®. The aim of the study was to find out, whether there exists a correlation between platelet function and blood loss during osteosynthetic surgery for proximal femoral fractures in patients on APT. Methods: A single-center prospective noninterventional study was performed at the Department for Trauma Surgery at the Medical University of Vienna, 46 patients were included. Preoperative platelet function. intraoperative blood-loss, drainage volume on the second day after surgery, hemoglobin and hematocrit drop, as well as the total blood-loss were measured and statistically evaluated. Results: The measured platelet function was reduced in patients on ASS and on clopidogrel. There was a weak correlation between platelet function in the ADP test and intra-operative blood-loss of patients on Clopidogrel (correlation-coefficient r(ADP)=0,37) and total blood loss (r(ADP)=0,22). No correlation was found between platelet function and blood loss in the ASPI test (r(ASPI)=0,01) in patients taking ASS. Conclusion: Valid response rates to ASS and/or Clopidogrel are found using MEA. Patients with reduced platelet function due to APT neither showed increased blood-loss volumes perioperatively nor higher rates of complications following osteosynthetic surgery for proximal femoral fractures. Performing an accurate measuring of preoperative platelet function could reduce the time to surgery in patients with proximal femoral fractures taking Clopidogrel.

Abstract no.: 46864 RELATIONSHIP BETWEEN SERUM 25-HYDROXYVITAMINE D LEVEL AND RISK OF FALLS IN THE ELDERLY

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Recent investigations have posited a direct link between vitamin D3 and skeletal muscle, with a deficiency correlating with decreased strength and greater prevalence of falls. This deficiency is increasingly recognized as a worldwide epidemic with more than a billion people worldwide deficient in vitamin D. Although the contribution of vitamin D in improving health and functional capacity are well supported in the literature, the remedial benefits of vitamin D as a standalone treatment option to reduce fall risk are tenuous. This prompted the execution of this study to provide a better understanding of the therapeutic value of vitamin D on improving muscle function and decreasing the risk of falls among the elderly. A total of 34 older adults (mean age: 82 years old (±4.1 years), 13 male/ 21 female) were screened for their serum 25(OH)D levels (High- above 40 ng/ml; Low - 30-40 ng/ml; and insufficient- below 30 ng/ml) and performed standard gait and postural tasks with forceplates, accelerometers, and gyros for assessing mobility and stability linked to fall risks. The results indicated that postural stability and mobility were closely linked to their vitamin D serum levels. Furthermore, risk of falls (both indoors and outdoors) were associated with vitamin D serum levels below 35 ng/ml similar to normal mobility function. In conclusion, vitamin D serum levels need to be checked in relation to fall risks and mobility decrements, and individuals with serum 25(OH)D levels lower than 35 ng/ml may benefit from vitamin D3 supplementation to improve mobility and stability.

Abstract no.: 47664 THE ROLE OF SURGICAL TRAINEES IN CLINICAL EDUCATION: A NATIONAL SURVEY

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Introduction The General Medical Council (GMC) of the United Kingdom suggests that doctors have a duty to train and contribute to the education of other doctors around them (GMC 2009), although with the caveat that those in the business of clinical teaching should have some form of teaching gualification Objectives We sought to evaluate the current levels of engagement of surgical trainees and recently appointed surgical consultants in clinical teaching. Methods All trainees who commenced a basic or higher surgical training post during or after 2007 were invited to participate. The electronic questionnaire was administered using the survey tool GetFeedback. The questionnaire collected information regarding surgical speciality, current role, the quantity of teaching that respondents engaged in and whom they taught, teaching motivations and barriers and a free text option was provided for other comments. Results There were 128 respondents out of 358 invitations to participate (36% response rate). Over 70% of respondents engaged in clinical teaching for two hours or greater each week. With regards barriers encountered, the majority of respondents found that a lack of time dedicated to teaching due to clinical commitments was an impediment to providing teaching. Less than half of the respondents claimed to have formal training in clinical education. Conclusion Given our findings and exploration of the literature, we feel that the provision of teacher training is key to the improvement of medical education. We argue that this should not occur after university, but should be a key component of undergraduate education.

Abstract no.: 47681 UP-REGULATION OF TRAF2 SUPPRESSES NEURONAL APOPTOSIS AFTER RAT SPINAL CORD INJURY

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TNF receptor-associated factor 2 (TRAF2) for signal transduction of the cell death receptor has been well-established. However, the role of TRAF2 in spinal cord injury is still unclear. In this study, we detected the dynamic change patterns of TRAF2 expression using an acute spinal cord contusion injury (SCI) model in adult rats. A striking upregulation of TRAF2 was found by western blot and immunohistochemistry after spinal cord injury. Double immunofluorescent staining demonstrated that upregulated-TRAF2 was mostly found in neurons. Moreover, co-localization of TRAF2 with active caspase-3/8 was detected in NeuN. In vitro, we analyzed the association of TRAF2 with active caspase-3/8 on PC12 cells by western blot, which was parallel with the data in vivo. Knocking TRAF2 down with siRNA demonstrated its probable anti-apoptotic role in the process of neuronal apoptosis after spinal cord injury. To summarize, we firstly revealed the temporal and spatial expression changes of TRAF2 in spinal cord injury. Our data suggested the upregulation of TRAF2 triggered by trauma plays an important role in suppressing neuronal apoptosis after SCI.

Abstract no.: 46557 IDENTIFICATION OF POLYTRAUMATIZED PATIENTS IN AN "IN EXTREMIS" CONDITION - A NOVEL APPROACH Lukas NEGRIN, Anna ANTONI, Stefan HAJDU, Thomas HEINZ Department of Trauma Surgery, Medical University of Vienna, Vienna (AUSTRIA)

Objective: To provide an appropriate definition for early identification of polytraumatized patients in an extremely critical condition, characterized by a particularly high mortality rate, and to identify predictors of mortality in this patient population. Materials and Methods: Polytrauma victims (ISS ≥16, age ≥18 years), who had been admitted to our level I trauma center in a time period of three years, were retrospectively allocated to the "in extremis"-group and to a "non in extremis"-group (matched according to age, gender and ISS) by applying our novel definition including seven criteria referring to hemodynamic and cardiorespiratory instability. Results: Out of 347 polytraumatized patients worth considering according to our study design, 64 individuals (mean age, 48.5 years; mean ISS, 43.6), including 57 individuals with blunt and seven individuals with penetrating trauma, met the criteria of our definition and were combined to the "in extremis"-group. The most frequently injured body regions were thorax (75.0%), lower extremity (67.2%), head (57.8%), and upper extremity (50.0%). 36 patients (56.3%) died, thus revealing a threefold higher mortality rate than the matched "non in-extremis"-group. Mean age and ISS of the deceased patients in extremis were significantly higher compared to the survivors in extremis (53.4 vs. 42.1 years, p=0.037; 53.7 vs. 30.6, p<0.0001). ROC statistics provided a cut-off value of 40.5 years for age and a cut-off value of 36 for the ISS with regard to mortality. Conclusion: Our novel definition might be an appropriate tool or at least an impetus for defining polytraumatized patients in extremis in clinical practice.

Abstract no.: 46562 IS SERUM NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN A RELIABLE MARKER TO DETECT ACUTE KIDNEY INJURY IN POLYTRAUMATIZED PATIENTS?

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Objective: To investigate if serum neutrophil gelatinase-associated lipocalin (sNGAL) may predict acute kidney injury (AKI), which is diagnosed within the first posttraumatic days, in polytraumatized patients and to reveal if injury pattern and/or severity might affect the occurrence of AKI. .Material and Methods: This prospective observational study included 40 consecutive polytrauma victims (ISS≥16; age ≥18 years, survival time ≥48 hours), who were directly admitted to our level I trauma center within one hour after the trauma occurred. sNGAL levels were assessed at admission and on day 2 after trauma. AKI was diagnosed by an increase of serum creatinine level of at least 0.3 mg/dl within a time period of 48 hours. Results: Out of 30 men and 10 women with a mean age of 43 years and a mean ISS of 29 seven patients developed AKI, four of them needing renal replacement therapy (RRT). sNGAL levels measured at admission were significantly higher in individuals treated with RRT than in those not needing RRT. Day2-sNGAL levels were significantly higher in patients suffering from AKI than in the no-AKI-group as well as in men compared to women. Surprisingly, early AKI was not associated with injury severity. Conclusion: Day2-sNGAL levels mainly originate from injured renal epithelium, whereas high initial sNGAL levels may be caused to a large extent by activated neutrophils and non-renal epithelial cells. Therefore, sNGAL levels measured shortly after trauma cannot be entirely attributed to AKI, concluding that sNGAL cannot be considered a reliable predictor of early AKI in polytraumatized patients.

Abstract no.: 48786 UPPER EXTREMITY INJURIES CONSTITUTE RED FLAGS IN ORTHOPAEDIC GUNSHOT TRAUMA ASSESSMENT

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Evaluation of 294 patients at a level I South African trauma centre Background: Armed violence constitutes one of the greatest global health challenges. While epicentres of gunshot trauma are located in South America and Africa, only minor contributions in the field of orthopaedic ballistic trauma research were made from these regions. Methods: This is a prospective cohort study of patients who presented with an extremity gunshot injury at the Trauma Unit of Groote Schuur Hospital in Cape Town, South Africa, between June 2014 and April 2015. Results: In 1123 gunshot trauma admissions during 10 months, 290 patients (25.8%) presented with extremity injuries (91.5% males, n=269). Median age was 26 years (IQR 13.0) and 44.9% was shot in intentional interpersonal violence. Median injury severity was 4.0 with IQR 8.0. Only one fifth of patients had major trauma associated with a 10% mortality rate risk (n=50, 17%). No statistically significant relation between age, intoxication or gang violence and injury severity was found. Upper extremity injuries were associated with a higher risk of fractures (RR 2.15, p=0.05), higher number of nerve injuries (p=0.01) and higher mean ISS (p=0.01). Only 43 patients (14.6%) came from the referral area of our hospital. 65.7% Of patients with low injury severity could have been treated at the assigned or referring hospitals based on the orthopaedic injury assessment. Conclusions: Upper extremity gunshot wounds constitute a red flag in gunshot trauma assessment. Overall injury severity was low and many patients were probably referred to our tertiary care facility unnecessarily.

Abstract no.: 46774 OUTCOME OF DISTRACTION OSTEOGENESIS BY RING FIXATOR IN INFECTED, LARGE BONE DEFECTS OF TIBIA Karan SIWACH Subharti Medical College, Meerut, Rohtak (INDIA)

Background: Salvage of large, infected bone defects in tibia poses a formidable problem. The present prospective study aimed to evaluate radiologic and functional outcome of ring fixator in infected, large (≥ 6 cm) bone defects of tibia treated with distraction osteogenesis. Materials and methods: The study included 35 patients (30 males and 5 females) who had minimum of 6 cm gap after radical resection of necrotic bone and presence or history of active infection. Mean age was 36.1 years. Mean bone gap was 7.27 cm. Mean follow-up period was 25.4 months. Results: Fracture united primarily in 17 cases and after fixator adjustment with freshening of fracture margins in 15 cases. Fixator adjustment with bone grafting was done in one patient to achieve union. One patient had nonunion and another had amputation. The bone result was excellent, good, and poor in 19, 13, and 3 patients, respectively. The functional results were excellent, good, fair and failure in 14, 19, 1, and one patient, respectively. 24 patients had superficial pin tract infection and 18 patients had ankle stiffness. Conclusion: Ring fixator systems reliably achieve union in infected, large bone defects of tibia and help in treating infection, shortening, bone and soft tissue loss simultaneously. We advocate early freshening of fracture ends and removal of interposed soft tissue at docking sites to achieve union. Superficial pin tract infection and ankle stiffness are common problems in managing large tibial defects. But good to excellent functional outcomes can be achieved in majority of patients

Abstract no.: 47787 CYCLIST INJURIES IN RELATION TO A TRAM SYSTEM – DEFINING AN AT RISK POPULATION, INJURIES SUSTAINED AND THEIR EFFECTS ON CYCLISTS

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Introduction: Trams are an efficient form of public transport. Some share roads with cyclists, yet injuries relating to tram-systems are poorly understood. The aim of this study was to characterise injuries, patient demographics and effects on cyclists. Methods: Retrospective review of medical records/imaging of tram-system related cycling injuries(TRCI) over 7 years.Patients also contacted by telephone. Scottish Index of Multiple Deprivation used to assess socioeconomic deprivation. Results: 191 patients(119 male, 72 female). Males were older(p=0.001). Patients exhibited disproportionately low levels of socioeconomic deprivation. 142 patients caught their wheel in tram-tracks, 32 slid on tracks, 1 collided with a tram. TRCI due to wheels sliding were associated with wet conditions(p=0.028). There were 55 upper limb fractures/dislocations, 8 lower limb and 2 facial fractures. 98 were commuting to/from work, 53 were cycling for leisure. Commuters were more likely injured between Monday and Friday (OR 2.86,p=0.007). 74% intended to cross tramlines. 43% TRCI occurred at junctions. 53% reported traffic pressures contributed to the accident. 80% stated their confidence cycling was affected - especially females (OR 11.86,p<0.001) and patients sustaining fractures/dislocations (OR 2.8,p=0.043). 17% did not return to cycling (commoner in females, OR 2.55,p=0.032). Patients who sustained a fracture/dislocation were more likely to undergo procedures (OR 6.33), took longer to return to work (median 5 vs 1 day,p<0.001) and cycling (median 57 vs 21 days;p<0.001). Conclusion: TRCI have been clearly characterised, facilitating targeted prevention techniques. This is the first study to report a socioeconomic link with TRCI and to assess effects of TRCI on cyclists.

Abstract no.: 48040 MANAGEMENT AND OUTCOME OF POLYTRAUMATIZED CHILDREN: TWENTY YEARS OF EXPERIENCE FROM A LEVEL I TRAUMA CENTER

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Background: Polytrauma in the pediatric patient is a life-threatening condition that requires special care and an interdisciplinary approach to yield adequate treatment. The aim of this study was to present 20 years of experience of a central Europe level one trauma center with care of polytraumatized patients. Material and Methods: This study was performed as a retrospective data analysis including patients aged < 16 and ISS \geq 16 who were treated between August 1992 und June 2013 at our Department. Results: 126 patients with an average age of 8.5 years (± 4.77) ranging from three months to 16 years were included. Patients presented with an initial GCS of 7.4 (range, 3 to 15), and ISS of 30.5 (range, 16 to 75) at admission. The injury pattern was in 48% caused by traffic accidents, in 43% by a fall and other reasons in the remaining 11%. On admission 31 patients (24.6%) were hemodynamically instable, of those 18 (14.3%) required resuscitation measures. In total 92 patients (73%) survived and 34 died, which accounts for a mortality of 27%. Conclusion: The polytrauma in children is a very rare disease mostly with severe injuries with a high morbidity and mortality.

Abstract no.: 48762 PERSPECTIVES ON THE MANAGEMENT OF HUMERUS FRACTURES DUE TO GUNSHOT TRAUMA: AN INTER- AND INTRA-OBSERVER RELIABILITY STUDY

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Background: There is no gold standard for the classification and management of upper extremity fractures due to gunshot trauma available up to date. Interobserver agreement studies reported low levels of intra- and inter-rater reliability (IRR) for the classification of proximal humerus fractures using Neer and AO/OTA classification. Methods: This is an agreement study performed with a fixed panel of 32 observers who answered a set of 14 questions regarding classification and treatment by rating multiple view X-rays of a fixed set of 22 cases of proximal and midshaft fractures at two sessions with a two-week interval. Results: There was slight yet significant overall interobserver agreement on the AO classification (k=0.20). Overall inter-observer reliability of agreement on preferred treatment was similar to classification agreement (k=0.18). Overall intra-observer reliability was fair for classification and moderate for treatment (k=0.39, 0.42). There was fair overall agreement on debridement of the wound (k=0.26) and removal of the bullet (k=0.31) and close to poor agreement for the use of temporary external fixators (k=0.03). Vascular injury was rated as influential factor on decision-making by the majority of observers (53.7%), followed by bilateral (37.1%) and other fractures (26.8%). Conclusions: This is the first intra- and interobserver agreement study that evaluated classification and treatment of gunshot humerus fractures in the light of patient- and fracture-related factors. Consistent with previous studies, there was low interobserver agreement for the classification and treatment of proximal humerus fractures, thereby contributing to the field of knowledge with specific evidence regarding gunshot trauma.

Abstract no.: 47634 RISK FACTORS FOR POSTOPERATIVE DELIRIUM AFTER NECK OF FEMUR FRACTURE SURGERY

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INTRODUCTION Delirium is a common complication after surgery in the elderly that leads to increased length of hospital stay, cost, and other adverse outcomes. We sought to identify the strongest predictors of delirium in patients undergoing surgery for femoral neck fractures. METHODS We performed a prospective cohort study of 381 consecutive patients undergoing surgery for NOF fracture from 2014-2015 in a UK Hospital. Patient demographics, comorbidities, cognitive status, biochemical and haematological results were recorded on admission. Post-operative cognitive status was assessed at regular intervals until discharge using the DSM-5 criteria. Patients were followed up for 1-year to assess mortality. Statistical analysis was performed using independent T tests for discrete and x2 tests for categorical variables. Binary logistic regression was performed to identify independent predictors of delirium. RESULTS 70 (18%) developed new-onset delirium post-operatively. Patients experiencing delirium were significantly older and more likely to be female than non-affected patients. The presence of delirium was associated with increased length of stay, mortality rates at 30-days and 1-year. Independent predictors of delirium included age≥65 years, presence of anaemia, cardiac disease, COPD, new onset electrolyte imbalance and renal failure. CONCLUSION Our results indicate an increased incidence of delirium in older females with greater comorbid conditions. Delirium was found to be associated with increased length of stay and mortality. Recognising risk factors of delirium and diagnosing it in a timely manner could help mitigate its effects.

Abstract no.: 47136 THE CHAMBER INDUCTION TECHNIQUE (C.I.T) IN THE USE OF BONE TRANSPORT TO IMPROVE THE RIGENERATE QUALITY AND TO HEAL THE SEPTIC CONDITION

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Aim of this study is to show our results in the treatment of septic critical bone defects of the tibia using an hybrid procedure base on the Masquelet/Chamber Induction Technique and distraction osteogenesis. We have retrospectively evaluated all the patients treated with the same technique: first step: resection, debridment, antibiotic spacer implantation and fixation using circular external fixator; second step: spacer removal and from second day postoperative we started bone transport 1 millimeter per day until to reach the docking site. When necessary a third procedure was performed at the docking site in order to get union. Average follow up was 24 months. We have calculated the average clinical and radiological healing rate and healing time. We have treated 22 patients. We have obtained in 14/22 of the cases a radiological restoration of the bone union and a clinical healing without a procedure at the docking site. In 8/22 we had to perform a procedure at this site by cruentation and bone grafting. We had not recurrence of deep infection in all the cases, in 4/22 patients we had registered a superficial infection of the external fixator pins. The treatment with CIT seems to be a good therapeutic approach for patients with septic critical bone defects of the tibia. This technique associated with distraction osteogenesis can give good results with lower complications and safety, it increases the drive up to the distal bone transport and increases the possibility of consolidation at the docking site avoiding, in some cases, additional treatment.

Abstract no.: 46498 MEDIAL MALLEOLUS FIXATION IN COMBINATION WITH FIBULAR INTRAMEDULLARY NAILING – ARE WE WASTING OUR TIME?

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Background: The role of the medial malleolus in ankle stability is frequently debated. We compare the rates of failure and complications amongst medial malleolar fractures, treated operatively and non-operatively in combination with fibular intramedullary nailing. Methods: We identified 336 fibular nail cases over an 8-year period with adequate peri-operative radiographs. Lateral malleolar only fractures were excluded. Demographic data, fracture classification. and detailed radiographic parameters were recorded following comprehensive retrospective review. Patients completed EQ-5D, Olerud and Molander, and Manchester/Oxford Foot and Ankle (MOXFQ) score questionnaires. Results: There were 237 patients with a mean age of 66.2 years (25-96 years). Medial malleolus fracture fixation was performed in 186 cases (79%). In 51 cases the fracture was not fixed. The two groups were well matched with respect to demographics, fracture type and presence or absence of a posterior malleolus fracture. There was no significant difference with respect to failure requiring revision (p=0.634) or loss of talar reduction (p=0.157). Medial malleolus non-union occurred in 16 patients (31%) treated non-operatively, compared with 22 patients (12%) undergoing fixation (p=0.002). This was not associated with increased pain or functional restriction. No patient required surgery for non-union. Nine patients (5% of fixation group), required late removal of medial sided hardware. Conclusion: We have shown no significant difference in revision rates between fixation and non-fixation groups. With anatomical reduction of the talus coupled with sound fibular fixation we believe that medial malleolar fractures can be treated non-operatively. Medial malleolus non-union appears to be of limited clinical significance.

Abstract no.: 47628 A COMPARISON OF TREATMENT SETTING FOR ELDERLY PATIENTS WITH HIP FRACTURE, IS THE GERIATRIC WARD SUPERIOR TO CONVENTIONAL ORTHOPEDIC HOSPITALIZATION?

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introduction: Hip fractures in the elderly are a major cause of morbidity and mortality. The treatment settings of these patients may change their outcomes. The aim of this study is to compare the outcomes of patients with hip fractures who were admitted to the orthopedic vs. geriatric wards. Patients and Methods: A retrospective study was conducted on 217 consecutive older patients with 219 hip fractures admitted either to the orthopedic or the geriatric ward between Jan. 2013 and Jun. 2015. Information regarding demographic, medical history, surgical management, hospitalization, and one year readmissions and mortality data was retrieved from electronic charts. Results: 102 hemiarthroplasty patients were admitted to the orthopedic ward and 117 to the geriatric ward. Patients' characteristics, including age, living arrangements, mobility status and the Charlson Comorbidity Index was similar between groups. Patients from the orthopedic ward had shorter hospitalization time (9±5.1 vs. 10.8±6.7 days, p=0.022) and presented a lower inhospital complication rates (0.6±0.96 vs. 1±1.9, p=0.022), namely fewer events of urinary retentions, urinary tract infections and pneumonias (8.8% vs. 23.9%, p=0.004, 3.9% vs. 14.5%, p= 0.010 and 2.9% vs. 12.2%, p=0.034, respectfully). Readmission rates were similar. Neither in hospital nor one year mortality rates differed between groups. Conclusions : Our study found that geriatric care was not superior to orthopedic directed management in the treatment of elderly patients with hip fractures in terms of in-hospital complications, and hospitalization times.

Abstract no.: 46981 AN INNOVATION FOR PERFECT DOCKING IN BONE TRANSPORT FOR GRADE IIIB OPEN TIBIAL FRACTURES WITH BONELOSS

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Objective: To evaluate the method for circumferential contact at docking site which could reduce the chance of bone grafting at docking site. Patients and methods: 13 patients with IIIB tibial fractures with bone and soft tissue defects with Ganga score above 11were analyzed. The age of patients ranged from 17yrs to 56yrs with average age being 44.6yrs. The amount of bone defect ranged from 7cm to 13cms with average being 10.6 cms. The Orthofix applied on day one or prior to soft tissue procedures usinga intra operative temporary intramedullary rods and plates to achieve correct alignment. Bifocal transport was done in four patients and unifocal transport done in 9 patients. Soft tissue cover done in the form of local flap in 4 patients, free flap in 3 patients and crossleg flap in 9 patients. All patients were followed up ranging from 18 to 60months with average being 22months. Results: All 13 patientshad good circumferential docking and consolidation of both docking as well as transport regenerate, with good union. All patients had limb length equality and correct alignment. All patients had good radiological and clinical outcome. Conclusion: Use of temporary intra operative intramedullary rods and plates in Open tibial fractures with boneloss is important to maintain the length and alignment of the limb and to achieve good circumferential docking. This is a simple method and extremely useful. Eliminates the need for computer assisted device. Easy to use and reproducible. Avoids necessity of secondary bone grafts procedure for achieving union and improves clinical outcome.

Abstract no.: 48207 THE USE OF TAYLOR SPATIAL FRAME (TSF) FRAME IN MALAWI: 10 YEAR EXPERIENCE AT BEIT CURE HOSPITAL Nicholas LUBEGA Beit CURE Hospital, BLANTYRE (MALAWI)

Introduction: Taylor Spatial Frame (TSF) can be used to treat multiple orthopaedic conditions in the adult and paediatric population. Aim: This study reviewed patients treated with TSF at Beit CURE hospital over a 10 year period (2007 to 2017) describing indications, challenges and complications. Methods: Patients were reviewed noting their demography, indication, complications, length of stay in hospital duration of having TSF, etc. The TSF configuration was noted e.g. spanning knee, spanning ankle fixators or hybrid TSF/ Ilizarov fixators. Results: Over 30 adults and 50 children have been treated with the TSF in our institution. The indications for the operation included congenital conditions, malunions, open fractures, para articular fractures, developmental conditions like Blount's disease, bone transport to close defects secondary to infection/tumours, bone lengthening in leg length discrepancy, gunshot wounds etc. Patients' ages ranged from as young as 10 years to above 50 years. The average length of hospital stay depended on the underlying condition being treated, the longest stay (as long as 3 months) being in children with congenital deformities and those with chronic osteomyelitis. Complications included wound breakdown and pin site infections. Some patients especially children requiring multiple procedures needed psychological support. Skin breakdown at the docking site was observed in some patients having bone transport secondary to osteomyelitis bone loss. Soleus flap was used to cover these defects. Conclusion: TSF is a versatile tool that can be used safely to treat multiple conditions in a sub Saharan Africa hospital setting.

Abstract no.: 46519 WEIGHT-BEARING RECOMMENDATIONS AFTER OPERATIVE FRACTURE TREATMENT – FACT OR FICTION?

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Introduction: Rehabilitation after lower-extremity fractures is based on the physicians' recommendation for partial-, or full weight-bearing. Clinical studies rely on this assumption, but continuous compliance or objective loading-rates are unknown. Purpose of this study was to determine the compliance to weight-bearing recommendations by introducing a novel, pedobarography system continuously registering postoperative ground forces into ankle, tibial shaft and proximal femur fracture aftercare. Methods: In this prospective, observational study, a continuously measuring pedobarography insole was placed in the patients shoe during the immediate postoperative aftercare after ankle, tibial shaft and intertrochanteric femur fractures. Weight-bearing was ordered as per the institutional standard and controlled by physical therapy. The insole was retrieved after a maximum of 6 weeks (28 days [range 5-42 days]). Non-compliance was defined as a failure to maintain, or reach the ordered weight-bearing within 30%. Results Overall 30 patients were included in the study. Fourteen (47%) of the patients were compliant to the weightbearing recommendations. Within 2 weeks after surgery patients deviated from the recommendation by over 50%. Sex, age and weight did not influence the performance (p>0.05). Partial weight-bearing patients showed a significantly increased deviation (p=0.01). Conclusions: Our study results show, that despite physical-therapy training, weight-bearing compliance to recommended limits was low. Adherence to the partial weight-bearing task was further decreased over time. Uncontrolled weight-bearing recommendations should thus be viewed with caution and carefully considered as fiction. The presented insole is feasible to determine weight-bearing continuously, could immediately help define realtime patient-behavior and establish realistic, individual weightbearing recommendations.

Abstract no.: 48801 CONDYLAR WIDTH OF THE TIBIAL PLATEAU: A STUDY OF 3D CT MEASUREMENTS OF 84 NORMAL KNEES

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Background: Femoral condyle and articular width are commonly used references for tibial plateau fracture reduction. The purpose of this study was to investigate and quantify the relationship between distal femur and proximal tibial measurements to aid in judging operative reduction of tibial plateau fractures. Methods: 3D-computed-tomography(CT) images of 84 normal knees (19 males & 23 females) were analyzed. 3D-CT images were rotated into 3 commonly used AP views, the posterior condular tangent line(PCT-AP), the patella-center(PIC-AP), and the 50% fibular coverage(FC-AP). We measured the mediolateral width of the femoral condyle(fML), femoral articular surface(fAW), tibial condyle(tML) and tibial articular surface(tAW). We measured the horizontal position(difference) of the lateral and medial tibial condyle and articular edge in relation to the associated femoral condyle and articular edge(dLC, dMC, dLA and dMA). Results: Inter- and intra-observer reliability was best using the view compared to other views(p<0.05). In the PCT-AP view, means of fML, tML, fAW and tAW were 81.4±6.9, 74.0±6.4, 65.7±7.3 and 66.6±6.6 mm, respectively, and means of dLC, dMC, dLA and dMA were -4.7±4.1, -0.9±1.9, -0.1±1.5 and 0.9±1 mm, respectively (negative represents tibia is narrower). There was no statistical difference between left and right knees(p>0.05). plateau reduction. The PCT-AP view is the most reliable and reproducible AP view. The lateral tibial articular width is wider(outside the plumb line) in relation to the lateral femoral articular width. Understanding these variations in width can help the surgeon improve accuracy of tibial plateau reduction

Abstract no.: 46242 MANAGEMENT OF ANKLE FRACTURES WITH SOFT TISSUE SWELLING; EXPERIENCE FROM A UK MAJOR TRAUMA CENTRE Daniel THURSTON, Gregory MCCONAGHIE, Sarah BARLOW, Faiz SHIVJI, Andrew TAYLOR Queens Medical Centre, Nottingham (UNITED KINGDOM)

Background: Ankle fractures represent a significant proportion of trauma workload. However, many patients are unsuitable for acute fixation due to poor soft tissue condition and are often admitted to await improvement, resulting in large outlays of resources. We aimed to assess the effectiveness of managing such patients at home. Method: Retrospective cohort study of all isolated, closed ankle fractures in skeletally mature patients undergoing fixation over one year. Data on demographics, fracture type, time to surgery and length of hospital admission were collected. Results: 171 fractures in 171 patients. Median age 48 years. 101 females, 70 males (ratio= 1 : 0.7). 59 (34.5%) operated upon within 48 hours of injury (median time 36 hours). In this cohort, median length of stay (LOS) was 2.9 days. 64 patients (57.1%) deemed to have poor soft tissues, 50 admitted pending improvement. This cohort was operated on in a median time of 5.7 days, with a median LOS of 8.5 days. 14 patients were managed at home, operated on in a median time of 9.6 days, with a median LOS of 1.4 days, representing a significant reduction in LOS (P<0.0001). Discussion: Best practice states unstable ankle fractures should be treated as soon as safely possible. However, significant soft tissue swelling or blistering necessarily delays surgery. We demonstrate this cohort can be safely discharged home whilst awaiting soft tissue improvement and, moreover, doing so can save scarce resources; in our cohort, 355 bed days per year (approximately £142,000) could be saved, with no deleterious consequences.

Abstract no.: 47311 PROSPECTIVE STUDY OF 30 CASES OF INTRACAPSULAR NECK OF FEMUR FRACTURE TREATED WITH BIPOLAR HEMIARTHROPLASTY IN ELDERLY

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Introduction: Femoral neck fractures are frequent and severe injury with consequent high morbidity and mortality. Osteoporosis and co-morbidities increases the incidence and complicates their treatment. Internal fixation by DHS or PFN is often unsuccessful. In the elderly return to premorbid status with early mobilization is paramount. Austin Moore and Thomson's hemiarthroplasty has been in use since many years but they have their problem. Their complications are reduced by use of bipolar prosthesis. Surgeon's dilemma still is regarding various options of treatment. The study is aimed at studying the surgical technique and clinical result in fracture neck of femur patients with bipolar hemiarthroplasty. Materials: A total of 30 cases of fracture neck femur were analyzed with radiographs and either cemented or uncemented bipolar hemiarthroplasty as per indication and Singh's Index was done. Follow up was assessed by radiographs and Harris Hip Score. Results: 73.34% were operated as cemented. There was no intra-operative complication. 93.34% patients had no post-operative complication. Radiologically 76.67% had neutral position of stem. 96.67% patients had no limb length discrepancy. >90% patients had complete range of motion. 93.34% patients had excellent to good results according to Harris Hip Score. Conclusion: In our study, all the patients had satisfactory functional outcome and resumed to their normal daily activity. There was no significant difference in using cemented and uncemented bipolar prosthesis. Bipolar prosthesis is a safe option in treating fracture neck of femur in the elderly with good recovery and painless movements in spite of having several co-morbidities.

Abstract no.: 46945 BILATERAL ASYMMETRICAL HIP DISLOCATION WITH ONE SIDE OBTURATOR INTRA-PELVIC DISLOCATION. CASE REPORT

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Introduction: Hip dislocations occur as a result of MVC and require high energy trauma.Bilateral hip dislocations are rare compared to unilateral ones. Case Presentation: A 32 year old female was involved in a MVC. She was complaining of severe pelvic pain and inability to feel her lower limbs. Right lower limb was flexed, internally rotated and adducted. The left lower limb was flexed, externally rotated and abducted. Radiological assessment revealed right hip posterior dislocation. The left proximal femur was dislocated inside the pelvis through the obturator foramen with fracture of superior/ inferior pubic rami. The patient underwent closed reduction of both hips in supine position under general anesthesia in the operating theatre. The left hip was reduced in two steps, first by traction in the line of deformity with some more flexion which brought the hip out of the pelvis and became as a posterior dislocation. Second step was to reduce the posterior dislocation by traction in the line of deformity, with adduction and internal rotation. The right hip was reduced with the same previous technique. Post reduction the right hip was stable on examination, but the left hip was unstable posteriorly in 90 degree flexion plus internal rotation. Thus skeletal traction was applied to the left proximal tibia. Post reduction pelvic radiograph and computerized tomography (CT scan) of the pelvis showed both hips were concentrically reduced with no intra-articular fragments. Conclusion: Hip dislocation is considered an orthopedic emergency and should be reduced as soon as possible to decrease rate of complications.

Abstract no.: 46199 SUCCESSFUL MANAGEMENT OF RESISTANT DISTAL FEMUR NON-UNIONS WITH ALLOGRAFT AND OSTEOSYNTHESIS : OUTCOME ANALYSIS OF 22 PATIENTS

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Introduction and purpose : Challenges to the surgeon in managing cases of resistant non union of the distal femur include poor bone stock, disuse osteopenia and joint contractures. Procedures varying from simple bone grafting to megaprosthesis revision have been described . We successfully managed such cases using our technique of combining cortical allograft struts to augment the medial femoral condyle coupled with autogenous iliac crest bone grafting and locking plate osteosynthesis. Materials & Methods :Between April 2012 and May 2014, 22 patients who presented with resistant non unions of the distal femur following initial surgery were managed by us using this technique. All patients were followed up post operatively and their time to union was noted. Functional outcome was calculated using LEFS (Lower extremity functional score) score .Results : All patients went on to achieve complete bony union . The average union time was 6.2 months (5 to 8 months). One patient who was a diabetic had superficial infection post operatively which was treated successfully with IV antibiotics. Average knee flexion was 110 degrees (80 to 130 degrees). The mean LEFS score was 78 (59 to 91).Conclusion:Combing a locking plate fixation with the bone grafting technique of using an allograft strut to support the medial condyle and autografts gives a good union and a good functional outcome in the management of resistant non-unions of the distal femur by enhancing the biology and enhancing the structural support.

Abstract no.: 47056 CHANGES IN THE ANATOMICAL POSITION OF THE SUPERFICIAL AND DEEP FEMORAL ARTERIES DURING INTERNAL FIXATION OF INTERTROCHANTERIC FRACTURES

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Introduction: Inadvertent iatrogenic injury to the profunda femoris during internal fixation of pertrochanteric neck of Femur fractures is a recognised problem. Deep femoral artery pseudoaneurysms and intramuscular haematoma are the most common pathologies described in the literature. To our knowledge there is no available literature addressing how traction and hip position during fracture reduction effects the location and proximity of the deep and superficial femoral arteries to the femur. Methods: With the use of ultrasound, we studied the relationship of the deep and superficial femoral arteries preand post- reduction at three pre-determined levels inferior to the lesser trochanter in 11 patients with intertrochanteric Neck of Femur Fractures undergoing internal fixation with dynamic hip screw at our institution. The distances were recorded and compared using Student's t-tests, and further correlation was made with a comparison of reduction position. Results: Reduction with internal rotation has the greatest effect on drawing the deep (DFA) and the superficial (SFA) femoral arteries closer to the femoral shaft at all three measured levels, most significant at 10.5cm below the LT. At this level, the DFA was 4.2mm closer with rotation ≥15 degrees, and displaced 8.4mm away from the shaft without rotation (p value - 0.04). Similarly, the SFA was drawn 7.5mm nearer with rotation and displaced away by 8.1mm without (p value -0.07). Conclusion: Due to the proximity of the DFA to the femur, extreme care must be taken by all who are involved with internal fixation of intertrochanteric femoral fractures.

Abstract no.: 46979 ANALYSIS OF INTRAMEDULLARY NAILING SURGICAL TECHNIQUE IN ASEPTIC FEMORAL SHAFT NONUNION

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Objective: Intramedullary nailing is the gold standard in treatment of femoral shaft fractures and nonunion rate varies from 2 to 7 % in English literature. The femoral shaft aseptic nonunion were critically evaluated for fallacies in surgical technique as possible cause of Nonunion. Patients and methods:137 patients with Aseptic femoral shaft nonunion between 2003 and 2012 with a minimum follow up of 2 year were analysed 44.8 % were short oblique and transverse fractures.23.7% were comminuted fractures. The age of patients ranged from 17 to 70 yrs with mean of 42.7 yrs, with 120 males and 17 female patients. The analysis was mainly to look into the alignment, distraction and the thickness of nail and also to critically analyse all the steps in surgery of intramedullary nailing of femur. Treatment methods for these fractures were also evaluated for final outcome. Results: The critical results were, malalignment noted in 39.5 % of patients, with varus in 26.3% and valgus in 13.1 % of fracture nonunion. Distraction noted in 7.9 % of fractures. Nonunion treated based on the existing alignment where revision nailing done in patients with malalignment, otherwise only augmentation plate preferred with 91.1 % success rate and average time to union of 4.7 months. Conclusion: Technical error seems to be the major cause of nonunion in our analysis. Extreme care in surgery could avoid nonunion in 50% of cases

Abstract no.: 46198

MODIFIED CAPANNA'S TECHNIQUE (VASCULARISED FREE FIBULA COMBINED WITH ALLOGRAFT) AS A SINGLE STAGE PROCEDURE IN POST TRAUMATIC LONG SEGMENT BONE DEFECTS OF THE LOWER END OF FEMUR – ANALYSIS OF A SERIES OF 16 PATIENTS WITH AN AVERAGE GAP OF 14 CMS

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Introduction: Salvage and reconstruction of large post traumatic defects of long bones are a major challenge.We present our experience with the modified Capanna technique (combining a vascularised free fibula and an allograft) in managing large defects of the lower end of femur as a single-stage procedure that would reduce the duration of treatment ,reduce the cost of care and enhance the chances of union . Materials & Methods: Between April 2012 and March 2015, sixteen patients with large post-traumatic bone defects in the distal femur had reconstruction of the defect by this technique. The average age was 31 years (16-52) and the average defect was 14 cm (10 to 21 cm). Fifteen patients had primary reconstruction while one was done following allograft failure. Average follow up was 24 months (10-34). Bony union was noted and functional outcome was calculated using LEFS score. Results: Fifteen grafts went onto union primarily. Average union time was 6 months (5 to 9 months). One patient had a failure of the graft and was revised with the same procedure using a vascularised fibula from the contralateral leg which went on to unite. Average knee flexion was 70 degrees (35 - 110 degrees) and the mean LEFS score was 66 (48 to 71). Conclusion: By bridging the defect, providing structural stability and enhancing the biology, modified Capanna technique (combination of allograft and vascularised free fibula) is a good single stage procedure for the management of large distal femur bone defects.

Date: 2017-12-01

Date: 2017-12-01 Session: Research Academy - Prof. SHANMUGANATHAN RAJASEKARAN Time: 12:30 - 13:00 Room: 01. Auditorium II

Abstract no.: 49410 INJECTABLE, BIOMECHANICALLY ROBUST, BIODEGRADABLE AND OSSEOINTEGRATIVE BONE CEMENT FOR PERCUTANEOUS KYPHOPLASTY AND VERTEBROPLASTY

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Purpose: A biodegradable replacement of poly(methyl methacrylate) (PMMA) cement, which is widely used for percutaneous kyphoplasty and vertebroplasty (PKP and PVP) but possesses formidable shortcomings due to non-degradability, is developed. Methods: Calcium phosphate cement (CPC) was redesigned by incorporating starch and BaSO4 (new cement named as CPB). The biomechanical, biocompatibility, osseointegration and handling properties of CPB were systematically evaluated in vitro and in vivo by the models of osteoporotic sheep vertebra, rat subcutaneous implantation and rat femoral defect. Results: CPB revealed appropriate injectability and setting ability for PVP and PKP. More importantly, its biomechanical strengths measured by in vitro and in vivo models were not less than that of PMMA, while its biodegradability and osseointegrative capacities were significantly enhanced compared to PMMA. Conclusions: CPB is injectable, biomechanically robust, biodegradable and osseointegrative, demonstrating revolutionary potential for the application in PVP and PKP. Keywords Calcium phosphate; kyphoplasty; vertebroplasty; biomechanics; osseointegration

Date: 2017-12-01 Session: Research Academy - Prof. SHANMUGANATHAN RAJASEKARAN Time: 12:30 - 13:00 Room: 01. Auditorium II

Abstract no.: 49411 THE STATUS OF TRIANGULAR FIBROCARTILAGE COMPLEX AFTER THE UNION OF DISTAL RADIUS FRACTURES WITH INTERNAL PLATE FIXATION

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Purpose: Distal radius fractures are associated with high incidence of triangular fibrocartilage complex (TFCC) tears. This study aims to evaluate the status of TFCC after the healing of distal radius fractures, and its clinical significance. Methods: Wrist arthroscopies were performed on 43 distal radius fractures, with an average age of 54 years old. Results: Twenty-six complete tears and 15 partial healed tears were noted. Five out of eight patients with intact TFCC tears had neither signs nor symptoms, while eight patients with TFCC tears had no complaint. While no association was found between ulnar wrist pain and TFCC tears, there was association between DRUJ instability and TFCC tears and fovea tears. The function outcome did not differ with respect to the integrity of TFCC. Conclusions: A large majority of TFCC tears remained unhealed after the union of distal radius fractures. However not all patients with tear were symptomatic. Level of Evidence: IV

Date: 2017-12-01 Session: Research Academy - Prof. SHANMUGANATHAN RAJASEKARAN Time: 12:30 - 13:00 Room: 01. Auditorium II

Abstract no.: 49412 PREDICTING CURVE PROGRESSION AT SKELETAL MATURITY IN ADOLESCENT IDIOPATHIC SCOLIOSIS USING THE DISTAL RADIUS AND ULNA CLASSIFICATION

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Purpose: The aim of study is to determine the risk of clinically significant curve progression in adolescent idiopathic scoliosis (AIS) based on the initial Cobb angle and test the utility of the distal radius and ulna (DRU) classification in predicting these outcomes. Methods: This was a prospective study of all AIS patients who presented with Risser sign of 0-3 and were followed till skeletal maturity or surgery, with minimum 2-year follow-up. Outcomes of 40° and 50° were used for analysis based on the cut-offs of adulthood progression risk and surgical threshold, respectively. Statistical analyses were performed with logistic regression to determine probabilities of reaching curve progression of 40° or 50° based on initial Cobb angle and DRU grading. Results: A total of 513 AIS patients was studied. At R6/U5, most curves (probability ≥48.1-55.5%) beyond Cobb angle of 25° progressed to the 40-degree threshold. For curves 35° or more, there was high risk of unfavorable outcomes regardless of maturity. Most patients at R9 did not progress regardless of initial curve magnitude (probability 0% to reach 50-degree threshold for initial Cobb angle ≥35 degrees). Conclusion: This large-scale study illustrates the utility of the DRU for predicting curve progression and may guide timing of treatment. AIS patients who are skeletally immature at high risk for progression to 40° or 50° at the end of growth despite a mild initial curve. Those with a scoliosis ≥35° are at increased risk of an unfavorable outcome despite being near skeletal maturity. Key Words: Adolescent idiopathic scoliosis; curve progression; bracing; growth; distal radius and ulna; DRU

Date: 2017-12-01 Session: Foot & Ankle Free Papers Time: 16:00 - 17:30 Room: 01. Auditorium II

Abstract no.: 48583 THE NORMAL ANATOMY OF THE SYNDESMOSIS ON WEIGHT BEARING CT SCAN.

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Syndesmotic injuries are common and frequently undetected. Historically, plain radiographic measurements have been undertaken to assess the syndesmotic integrity, but these have been shown to have poor reproducibility and sensitivity. The advent of cross-sectional imaging has improved this. Previous studies have described the normal syndesmotic anatomy on CT, however, all describe non-weight-bearing information. The pedCAT standing CT scanner (curvebeam, USA) allows 3D CT imaging with full weight bearing. This study describes the normal anatomy of the syndesmosis during weightbearing on standing CT scan. Firstly, this defines what happens to the syndesmosis relationship during weight bearing. Secondly, it is useful to establish normal values on weight bearing, as weight bearing is often used to try to demonstrate syndesmotic instability. Weight-Bearing CT scans were assessed in 50 randomly selected subjects (100 feet), taken for pathology unrelated to the ankle, hind foot or syndesmosis. Measurements were taken 9.45mm proximal to the tibial plafond. Six measurements and 2 angles were identified to assess the antero-posterior and medial-lateral translations of the fibula relative to the incisura, and the fibula rotation. Images were independently reviewed by two observers on two occasions. Inter- and intra-observer reliability were high using the described methodology. The normal range of values and standard deviations are described. This is the first study to assess the ankle syndesmosis on weight bearing CT and provides a comparison with the existing non-weight bearing studies. We believe this may enable subtle changes at the injured syndesmosis to be identified.
Abstract no.: 48293 THE RADIOGRAPHIC CHANGE OF THE DISTAL TIBIOFIBULAR JOINT FOLLOWING THE REMOVAL OF TRANSFIXING SCREWS AFTER SYNDESMOTIC FIXATION

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Purpose: The purpose of our study was to analyze the effects of the removal of transfixing screws on syndesmosis integrity using plain radiographs and CT scans. Patients and methods: Twenty-nine patients who had been treated with transfixing screw fixation for syndesmosis disruptions were studied prospectively. Plain radiographs and CT scans were obtained immediately before and 3 months after the removal of transfixing screws. The tibiofibular clear space (TCS) and tibiofibular overlap (TFO) were measured on plain radiographs and the anterior and posterior measurement ratio (A/P ratio) of the syndesmosis was measured on axial CT scans to analyze the effect of the removal of screws on syndesmosis integrity. Results: On plain radiographs, syndesmosis diastasis was not observed before and after the removal of transfixing screws. No statistically significant difference was found in the TCS and the TFO between measurements at prescrew and post-screw removal. However, the syndesmosis was found malreduced on CT scans in 7 cases (24%) before screw removal, 5 (71%) of which spontaneously reduced after screw removal. The A/P ratio of the 7 cases decreased from a mean of 1.37 at prescrew removal to a mean of 1.12 at post-screw removal. Conclusion: Syndesmosis malreduction not observed on plain radiographs after performing transfixing screw fixation for the disrupted syndesmosis was identified with CT scans. Of the cases with the malreduced syndesmosis, 71% showed spontaneous reduction after screw removal. Therefore, the removal of transfixing screws after a certain period of time is considered advantageous to achieve anatomic reduction of the syndesmosis.

Abstract no.: 46375 TIMING OF OPEN REDUCTION AND INTERNAL FIXATION OF ANKLE FRACTURES

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Background: Unstable ankle fractures are typically treated with open reduction and internal fixation (ORIF) in order to prevent post-traumatic arthritis. It is not uncommon for operative treatment to be performed in an ambulatory setting several days after injury. The purpose of this study is to compare the functional outcomes based on the amount of time between the injury and surgery. Methods: A retrospective chart review of 119 surgically treated acute, closed ankle fracture patients over a three-year period was performed. Sixty-one patients older than 18 years with a minimum of 24 months of follow-up were included. Demographic variables, duration from injury to surgery, complications, and Foot and Ankle Outcome Score (FAOS) were recorded. Comparison of each variable was performed between patients that underwent ORIF < 14 days after injury and >/= 14 days. Results: Fifty-eight patients were included. The mean age was 48 years. The mean follow-up time was 41 months. The average duration between injury and surgery was 7 and 18 days, respectively in the two groups. There was no statistically significant difference in demographic variables, length of operation, complication and FAOS between these two groups. Additionally, further analysis for the delayed fixation more than 7 days and 10 days also revealed no significant difference of FAOS. Conclusion: ORIF of ankle fracture more than 14 days does not significantly diminish functional outcome. Delay of operative treatment does not play a significant role in the functional outcome.

Abstract no.: 48399 ORIS POSTERIOR MALLEOLLUS ANKLE WITH POSTERIOR ANTEGLIDE PLATE BY POSTEROLATERAL APPROACH STUDY OF 16 CASES

Anil SINGHAL Traumacare & Arthroscopiy centre, Bulandshahr (INDIA)

16 cases of fracture dislocation/ subluxation of ankle with posterior malleolus involvement were fixed by one third tubular plate by posterolateral approach of ankle .pt had associated involvement of medial mallelus and fibula .all were follow up upto one year non weight bearing for six weeks.all achieved very good results compared to results compared where screw inserted from where ap screw placement.

Abstract no.: 48371 PEDOGRAPHIC ANALYSIS OF FOOT PRESSURE PATTERNS FOLLOWING OPERATIVE MANAGEMENT OF ANKLE FRACTURES AND ITS CLINICAL IMPLICATIONS

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Purpose: Management of ankle fractures based on principles of internal fixation is well established to improve functional outcome. However, changes in foot pressure patterns following ankle fractures has seldom been studied. We postulated that changes in foot pressure pattern have implication on the functional outcomes after ankle fractures. Methods: Patients between ages 20-60 with ankle fractures operatively managed in our institution were reviewed. Patients with ipsilateral and bilateral lower limb injuries, those with pre-existing ankle problems were excluded. Functional assessment was done using AOFAS score. Foot pressure changes were documented using a static Pedograph. Significant change was recorded as two or more regions of altered pressures when compared to the contralateral uninjured foot. Univariate and multivariate analysis was done.Correlation between variables was done using Pearson's correlation coefficient. Results 24 patients (15 men.9 women) were included. Most common pattern was the supination-external rotation type. The average follow-up was 30 months. Excellent-Good AOFAS scores were recorded in 14 patients, fair in 6 patients and poor in 4 patients. Changes in foot pressure patterns as measured on the static pedograph were compared with the contralateral foot. Significant changes were documented in 13 patients. Significant correlation between pressure changes and poor AOFAS scores was seen (p<0.05). Conclusion : Our study shows that such pressure changes may contribute to a poor clinical and functional outcome. Understanding these changes may also help in suggesting appropriate footwear modification and alter physical therapy.

Abstract no.: 48339 PLATELET-RICH PLASMA TREATMENT FOR CHRONIC HEEL PAIN: A PROSPECTIVE OUTCOME STUDY OF 193 CASES

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Objective: Platelet-rich plasma (PRP) injections have traditionally been used to treat sports related joint pains or tendinitis. However, very few studies have been published regarding the efficacy of platelet-rich plasma (PRP) injections in the treatment of heel pain (plantar fasciitis and achilles tendinopathy). We have been performing this procedure for the past 3 years and we will present our patients' outcomes. Methods: 193 patients underwent PRP injection for heel pain performed by a single surgeon from November 2014 to February 2017. Patient demographics; age, gender, visual analogue scale (VAS) for pain, pre- and post-injection AOFAS hindfoot scores and body mass index were obtained. Results: The mean age of our patients were 51 years (21 to 81 years), 63% were females. The average pre-operative VAS was 5.1 and post-op VAS was 1.1 which was maintained at the 3 months and at final follow-ups. The incidence of patients who benefitted from PRP injections was 94.7%. 15% of patients underwent a second PRP injection because of inadequate pain relief. The mean AOFAS hindfoot score was 68 pre- and 75 post-injection and the average BMI was 26 (range 19 to 42). Younger age group and a shorter time frame from symptom onset to treatment showed a higher percentage of pain reduction (47.7 vs 57.3 p=0.021). Conclusions: PRP is an effective form of treatment for symptomatic heel pain. A single injection has been shown to be effective with long lasting effects.

Abstract no.: 47398 ROLE OF DECOMPRESSION OF UNRECOVERED COMMON PERONEAL COMPONENTS ON SCIATIC NERVE

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It is not uncommon to see that common peroneal component of sciatic nerve remains unrecovered even months after complete recovery of medial popliteal part. 27 such patients seen From January 2012 to December 2016 form the basis of this study. All the patients were male in the age group of 8-64 years. Average duration of complete lesion of sciatic nerve was 14 months (range 8-24 months). In 14 patients, sciatic nerve was injured in fracture of pelvis. 7 due to injection in gluteal region. 3 were jatrogenic injury during operation on the hip and 3 were part of cauda-equina lesion due to massive disc prolapse. Common peroneal nerve showed no recovery even after 3-6 months after complete regeneration of medial component. Nerve conduction study revealed axonal type of lesion in all 27 patients. Ultrasound study showed compression of common peroneal nerve at neck of fibula in 25 patients. Not included in this study were 6 patients of direct injury to common peroneal nerve and 3 cases due to leprosy. Exploration of common peroneal nerve showed compression by a tendinous arch at neck of fibula in 25 patients. The tendinous arch was excised and overlying peroneus longus was cut for complete exposure of nerve. Complete recovery was seen in 21 patients, partial recovery in 1 and no recovery in 5.

Abstract no.: 48693 TIBIAL PLAFOND FRACTURE: EVALUATION OF SURGICAL TREATMENT

Marta Sofia SANTOS SILVA¹, Pedro SERRANO¹, Luís BARROS¹, João ESTEVES¹, Claudia RODRIGUES¹, Luís COSTA¹, José MURAS¹, Manuel MARQUES² ¹Centro Hospitalar do Porto, Porto (PORTUGAL), ² Centro Hospitalar do Porto, Porto (PORTUGAL)

Introduction: Tibial plafond fractures are potentially serious injuries and are often associated with poor soft tissue conditions. The aim of this study was to determine the rate of consolidation, main complications and final outcome. Methods: We studied 39 patients undergoing surgical treatment for Tibial plafond fracture. Pain was assessed using visual analogue scale (VAS) and functional status using the AOFAS scale. The fractures were classified according to Ruedi and Allgower. Mean follow-up time, mean age and comorbidities were recorded. The fractures resulted from traffic accidents or falls. The surgical strategy varied depending on the condition of the soft tissues: rigid osteosynthesis with plate, external fixator and percutaneous Kirschner wires and deferred internal fixation after an initial period of osteotaxy depending on skin conditions. Results: The consolidation rate was of 96.6%. The complications were infection, pseudarthrosis, cutaneous necrosis and wound dehiscence. Most patients had good clinical and functional results. Radiographically it was found that about 2/3 of the patients evolved to osteoarthrosis. Conclusion: Despite the high prevalence of radiographic degenerative changes, the clinical outcome is good, with most patients resuming their work and daily life without major limitations. Skin conditions determine the initial treatment strategy but do not seem to influence the end result. The progression to arthrosis is early and depends more on the severity of the fracture than on the surgical strategy used.

Abstract no.: 48396 COMPARATIVE STUDY FOR THE TREATMENT OF PLANTAR FASCIITIS BY CORTICOSTEROID VS PLATELET RICH PLASMA (PRP) - A PROSPECTIVE STUDY OF 40 CASES

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Purpose: To compare the efficiency of Corticosteroid & PRP for the treatment of chronic Plantar Fasciitis. Methods: In this series, 40 patients having chronic plantar fasciitis were treated with Platelet Rich Plasma and corticosteroid injection. The results were evaluated prospectively to compare the efficacy of both the procedures. One group of 20 patients received an injection of corticosteroid and the second group of 20 patients received an injection. Results: Both groups initially performed well. The patients were followed up at 3,6 & 12 months' interval and were analyzed with the scoring systems (AOFAS, VAS & Roles & Maudley system). The average pre-treatment AOFAS score at 3 months after treatment in the steroid group was 45 and improved to 82 & in the PRP group was 44 and improved to 90. However, the steroid group scores degraded with a sharp drop in the AOFAS rating to 74 at 6 months and 62 at 12 months after treatment. In stark contrast, the PRP group scores remained high with AOFAS scores of 87 at 6 month & 85 at 12 months after treatment. Conclusion: This study confirms the long- term superiority of PRP over corticosteroid injection for chronic planter fasciitis.

Abstract no.: 48019 COMPARISON OF TWO SURGICAL APPROACHES FOR DISPLACED INTRA-ARTICULAR CALCANEAL FRACTURES: SINUS TARSI VERSUS EXTENSILE LATERAL APPROACH

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Background: The purpose of this study was to compare the outcome between these two approaches for Sanders type-II and type-III fractures. Methods: Open reduction and internal fixation using the sinus tarsi and extensile lateral approach was studied in 100 cases(40 sinus tarsi and 60 extensile lateral) with displaced intra-articular calcaneal fractures. All patients were evaluated both clinically and radiologically. Results: Median Böhler and Gissane angle were improved to 26.5 degree(4.6 to 45), 115.5 degree(101.2 to 127.4) in the sinus tarsi group and 25.3 degree(3.7 to 44.6), 119.0 degree(73.5 to 145.6) in extensile lateral group at the final follow-up, respectively. Median calcaneal height, length, and width in the sinus tarsi and extensile lateral groups showed improvement to 45.1 mm(23.2 to 54.1), 75.9 mm(64.9 to 90.3), 37.6 mm(29.2 to 53.9) and 46.5 mm(32.7 to 59.5), 76.1 mm(67.3 to 97.9), 39.3 mm(29.2 to 47.8) at the final follow-up, respectively. Median AOFAS score was checked to 90 points(76 to 94) in the sinus tarsi group and 86 points(76 to 94) in the extensile lateral group at the final follow-up. No significant differences in clinical and radiologic outcomes were observed between the two groups. However, wound complication rate (13.3%) in the extensile lateral group was significantly higher compared to the sinus tarsi group(p-value = 0.022). Conclusions: The final outcomes between the two approaches for Sanders type-II and type-III intra-articular calcaneal fractures were comparable and equally successful. The selective sinus tarsi approach appears to be an effective and reliable method for the treatment of calcaneal fractures.

Abstract no.: 47964 ARTHROSCOPIC RELEASE OF EXTRINSIC ELBOW CONTRACTURE-RECOVERY AND FINAL RESULTS

Joanna WALECKA, Marta SLEZAK, Przemyslaw LUBIATOWSKI Rehasport Clinic; Department of Traumatology, Orthopaedics and Hand Surgery, University of Medical Sciences in Poznan, Poznan (POLAND)

Elbow stiffness substantially limits function of the upper extremity, resulting from both traumatic and degenerative etiology. The aim of this study was to evaluate the range of motion recovery and final outcome of patients after arthroscopic elbow release. Study is based on 44 consecutive patients with arthroscopic elbow release followed prospectively for at least 6 months. All patients were operated by one surgeon, between 2010-2015. The group included 9 females, 35 males, mean age 36,2±12,8 y.o., mean FU 18,5±17,7 weeks, with extrinsic elbow contracture resulting from trauma (22) and osteoarthritis (22). Mayo Elbow Performance (MEP) score was used for functional evaluation preoperatively and at final follow-up. Severity of contractures according to Morrey in majority were minimal (21 patients) and moderate (17 patients). The average ROM improved significantly in the final follow up by: extension 13,8°,flexion 11,7°,arc 28,3°. Significant improvement in arc has been achieved in both severity groups, however larger in moderate contracture. Best improvement was achieved intraoperatively, then in decreased within 1 week and finally improved over recovery time. Final extension was significantly lower then range achieved intraoperatively. Improvement in ROM was similar in both traumatic and degenerative contractures. MEP improved significantly from 73,5±12 to 92,2±15,3. There was one complication of resulting in mild median nerve neuropathy. Arthroscopic elbow release improves significantly range of motion and function in minimal and moderate elbow contractures also improving overall function. It is equally successful in posttraumatic and degenerative etiology of stiffness. Intraoperative improvement may not be achieved once the treatment is accomplished.

Abstract no.: 48318 POSTOPERATIVELY NEW-ONSET PSEUDOPARALYSIS -RETROSPECTIVE ANALYSIS OF 652 CONSECUTIVE ARTHROSCOPIC REPAIRS FOR LARGE-TO-MASSIVE ROTATOR CUFF TEAR -Hyeon Jang JEONG, Joo Han OH, Sung Min RHEE, Kyung Pyo NAM, Park JOO HYUN, Ji Hyun YEO, Kwang Jin LEE Seoul National University Bundang Hospital, Seongnam-si, Gyeonggi-do (SOUTH KOREA)

Background: Authors experienced patients of postoperatively new-onset pseudoparalysis(PNOP) after arthroscopic repair of large-to-massive rotator cuff tear. Therefore, would like to evaluate risk factors for PNOP and its reversal. Methods: Between March 2010 and May 2016, 652 consecutive arthroscopic repairs for large-to-massive tear were retrospectively analyzed and 26 PNOP patients(4.0%) were included. To determine the risk factors of PNOP, PNOP group was compared with remaining control group. Results: The mean age was 69.2 years(53-80) in PNOP group and 63.8 years(43-83) in control(p<0.001), however, the gender distribution was not different(p=0.09). Retear rate was not different between groups(42.3% vs. 28.9%, p=0.183). In multivariate regression analysis, older age(\geq 65 years), more retracted supraspinatus(\geq 30mm), preoperative stiffness, and torn subscapularis were risk factors for PNOP(Odds ratio, OR=3.522, 5.017, 3.149, 7.106; p=0.011, 0.005, 0.012, 0.002). The scoring system with a score of 10 was created based on the OR of risk factors(AUC=0.800) and cutoff-value was 8 out of 10 points, with sensitivity of 69.2% and specificity of 85.0%. Discussions: PNOP was reversed in 17 patients(65.4%) with mean duration of 10.0(6.5-17.5) months. Retear rates were not different between reversed and remained patients of PNOP(47.1% vs. 33.3%; p=0.683). In regression analysis, fatty infiltration of supraspinatus(< grade 3) was the only predictor for reversal(OR=22.000; p=0.014). Conclusions: PNOP can be occurred after arthroscopic repair of large-to-massive rotator cuff tear, though the incidence was low (4.0%). Therefore, surgeons would better to notice possible PNOP before surgery in high risk patients.

Abstract no.: 47420 ASSESSMENT OF POTENTIAL DELETERIOUS EFFECTS OF STRENGTH TRAINING EXERCISES OF THE SHOULDER JOINT ACCORDING TO SPECIFIC PATHOLOGIES

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Background: Shoulder strength training exercises represent a major component of rehabilitation protocols designed for conservative or post-surgical management of shoulder pathologies. Numerous methods are described for exercising each shoulder muscle or muscle group. Limited information is available to assess potential deleterious effects of individual methods with respect to specific shoulder pathologies. Objectives: To use a patient-specific 3D measurement technique coupling medical imaging and optical motion capture for evaluation of a set of shoulder strength training exercises regarding glenohumeral, labral and subacromial compression, as well as elongation of the rotator cuff muscles. Methods: One volunteer underwent Magnetic Resonance Imaging (MRI) and motion capture of the shoulder. Motion data from the volunteer were recorded during three passive rehabilitation exercises and twenty-nine strengthening exercises targeting eleven of the most frequently trained shoulder muscles or muscle groups and using four different techniques when available. For each exercise, glenohumeral and labral compression, subacromial space height, and rotator cuff muscles elongation were measured on the entire range of motion. Results: Significant differences in glenohumeral, subacromial and labral compressions were observed between sets of exercises targeting individual shoulder muscles. Muscle lengths computed by simulation compared to MRI measurements showed differences of 0 to 5%. Conclusion: This study represents the first screening of shoulder strengthening exercises to identify potential deleterious effects on the shoulder joint. Motion capture combined with medical imaging allows for reliable assessment of glenohumeral, labral and subacromial compression, as well as muscletendon elongation during shoulder strength training exercises.

Abstract no.: 47416 IS ACROMIOPLASTY PLANIFICATION USEFUL? A PROPECTIVE RANDOMIZED TRIAL

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Aim We developed a computer-assisted planning solution "ArthroPlanner" for allows to perform standard morphological acromioplastv. The solution bonv measurements, as well as 3D simulations of the patient's joint during everyday shoulder activities. The software computes the precise bone resection (location and amount) based on detected subacromial impingements during motion. Methods We reconstruct the bones of the patient's shoulder joint (scapula and humerus from the humeral head to the midshaft) from a CT image. The bones are then imported into ArthroPlanner software and the following steps are performed: 1) generic bone models are produced, 2) biomechanical parameters are computed to permit motion description of the glenohumeral joint, and 3) morphological measurements are performed to analyze individual shoulder anatomy (CSA, ß angle,...) are calculated. Post-operative visits for all patients were performed at 6 months, including a clinical examination (evaluation of the ROM, pain scores) and an echography to control the rotator cuff. A post-operative CT 3D reconstruction was performed to determine the actual bone resection executed at surgery compared to the planning recommendations. The data collected were compared between the groups. Results Preoperatively, groups were similar regarding scores, ROM, CSA, exept for B angle. Postoperatively, ROM (AFF, abd, IR, ER), VAS, ASES, CS, SSV, SST, and tendon healing were similar. Nevertheless, bone resection was less in the planification group. Conclusions Acromioplasty planification change the authors practice, allowing to do less acromioplasty and to remove less bone at different places.

Abstract no.: 47069 RESTORATION OF CAPSULOLABRAL ANATOMY WITH THE LABRAL BRIDGE REPAIR IN COMPARISON TO NATIVE AND STANDARD TECHNIQUES

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Background: A recently published arthroscopic technique, the Labral Bridge, aims to achieve normal anatomy by using a tape to secure the torn labrum to the glenoid in a running mattress type fashion. Labral height and native labral footprint coverage following a Labral Bridge repair (LB) when compared to a traditional knotted suture anchor repair with simple horizontal stitches (TT) were evaluated. Methods: Native labral height was measured using an electronic caliper in six pairs of shoulders. Then, Bankart lesions were created and repaired with either the LB or TT. Following the repair, the restored labral height was measured again. In further 3 pairs the native labral footprint was colored after labral resection. A standardized photograph was taken and the colored area was analyzed with imaging software. After repairing the lesions according to group LB or TT another photograph was taken and the remaining uncovered colored area was analyzed. Results: The mean native labral height in group LB was 5,2mm and 5,1mm in group TT, respectively. After repair, the mean labral height was 6.6mm in group LB compared to 5,6mm in group TT (p=0.01). The mean native labral footprint before the repair was 71 mm2 in group LB and 78.5 mm2 in group TT. After the repair the remaining uncovered area of the native footprint was 16.5 mm2 in group LB and 52.6 mm2 in group TT (p=0.002).Conclusion: The LB creates a significant higher capsulolabral bump and provides a significant better coverage of the native labral footprint than a TT.

Abstract no.: 46299 LEVEL OF THE SUBSCAPULARIS SPLIT DURING ARTHROSCOPIC LATARJET

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Introduction During arthroscopic Latarjet the level of the subscapularis split may be established from an inside-out or inside-out technique. The aim of this cadaveric study was to determine the location of the split created by an inside-out technique passing a switching stick from the posterior portal across the glenohumeral joint. The hypothesis was that this "inside the box" split would occur at the junction of the middle and inferior third of the subscapularis. Methods An inside-out technique was used to arthroscopically create a subscapularis split in 20 fresh-frozen human cadaveric shoulders. The distance between the exit point of the switching stick and the upper border of the subscapularis and the anterior circumflex vessels was measured arthroscopically and following open dissection. Results Twelve splits were in the upper third of the subscapularis, 3 were at the junction of the upper third and the middle third, and 5 were in the middle third. None were at the junction between the middle and lower third as desired. Conclusion Usual landmarks and arm positioning during arthroscopic Latarjet may engender a high subscapularis split if it is performed from with a switching stick inserted through the posterior approach, passed across the glenohumeral joint at the level of the inferior glenoid. Additional measures must be taken to ensure correct level of the split using an inside-out technique.

Abstract no.: 48262 THE EFFECT OF INSERTION ANGLE AND PULLING ANGLE ON THE PULLOUT STRENGTH OF ALL-SUTURE TYPE ANCHORS

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Introduction: The pullout strength of the of all-suture type anchors (ASAs) at the boneanchor interface was measured based on the angles of anchor insertion and anchor pulling. Data were evaluated with regard to the deadman theory. Method: Synthetic sawbones of two different densities with a 3-mm-thick cortical bone model attached on one side were used. ASAs were inserted at 45°, 60°, 70°, or 90° to the surface. Sutures were pulled at two different angles from the surface: 45° (modeling the physiologic pull of the supraspinatus) and 90° (modeling pulling out during knot tying). Pullout tests were conducted using a mechanical testing machine, and the maximum load to failure was recorded. Result: Pullout strength for high-density bones was significantly higher than that for low-density bones (p = 0.001). More vertically inserted ASAs showed stronger pullout strength for high-density sawbones. Pullout strength of anchors inserted at 90° and 75° was significantly higher than that for anchors inserted at 45°, regardless of pulling angle (all p < 0.05). The pullout strength of anchors pulled at 45° was higher than that for those pulled at 90° (all p < 0.05). Conclusion: This study suggests that ASA's desirable insertion is vertical rather than at the deadman's angle when performing knot-tying during surgery and when it is pulled by the supraspinatus tendon after surgery. However, the ASA showed stronger pullout strength when pulled in the physiologic direction of the supraspinatus tendon rather than in the knot-tying direction, corresponding to the deadman theory.

Abstract no.: 47719 THE EFFECT OF LATERAL ROW ANCHOR CONFIGURATION ON STRENGTH OF FIXATION IN DOUBLE ROW ARTHROSCOPIC ROTATOR CUFF REPAIR

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There are many different arthroscopic methods for repairing full thickness rotator cuff tears. Transosseous Equivalent fixation is the most up-to-date technique. This fixation technique is developed to increase the tendon-bone contact area and to share stress on multiple contact points. Transosseous Equivalent rotator cuff repair technique incorporate a medial and lateral row of suture anchors to attach the tendon to humerus. In this technique medial row anchors are applied first, after passing the sutures they are fixed on lateral anchors. During the fixation of the sutures to lateral anchors, excessive suture tensioning can loosen medial anchors. Theoretically, the direction of tensioning force and the position of lateral anchors can affect the pull-out force of medial anchors. In this study using Sawbone humerus models, we performed Transosseous Equivalent fixation technique on 15 samples divided in 3 groups. In Parallel group, the lateral and medial anchors distances from each other were the same, in Divergent group lateral anchors distance from each other was increased and in Convergent group this distance was decreased. After tensioning sutures by a similar force in all samples and placement of lateral anchors as aforementioned configurations, medial anchor pull-out forces have been measured. We found that the final position of lateral anchors and as the result the direction of the tension force will affect the pullout force of medial anchors. The Divergent group was the strongest in terms of medial anchor pull-out force. We also found that tensioning sutures causes a decrease in pullout force in all samples.

Abstract no.: 46298 BRAIN RECOVERY IS ONLY PARTIAL AFTER ANTERIOR SHOULDER STABILIZATION

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Aim The aim of the present study was to assess evolution of brain alterations in patients with glenohumeral instability before and one year after surgical stabilization. Background It is now that glenohumeral instability lead to brain remodeling. It is still unclear if shoulder stabilization allowed the brain to heal Methods 13 patients with shoulder apprehension (30.03 ± 7.64 years) underwent clinical and fMRI examination before and one year after surgery for shoulder dislocation contrasting apprehension cue videos and control videos. Data analyses included task-related general linear model (GLM), voxel-based morphometry (VBM) of grey matter and tract-based spatial statistics (TBSS) of white matter. Results GLM results show decreased activation of the left pre-motor cortex for post-surgery vs. pre-surgery. Decreased in orbito-frontal activity predicts good recovery of shoulder function measured by STT. Conclusions Changes at the brain level also occur one year after surgery with however incomplete recovery.

Abstract no.: 48291 ARTICULAR-SIDED VERSUS BURSAL-SIDED PARTIAL-THICKNESS ROTATOR CUFF TEARS. IS THERE A DIFFERENCE AFTER ARTHROSCOPIC TEAR COMPLETION AND REPAIR?

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High-grade partial-thickness rotator cuff tears are frequently treated by arthroscopic tear completion, followed by repair. However, there is limited literature on the difference in outcomes after repair of articular-sided and bursal-sided partial-thickness rotator cuff tears. The aim of this study was to compare the clinical outcomes of articular-sided and bursalsided partial-thickness rotator cuff tears after arthroscopic tear completion and repair. A series of 106 patients with partial-thickness rotator cuff tears who underwent arthroscopic repair by a single surgeon was evaluated. Sixty-five patients had articular-sided (articular group) and forty-one patients had bursal-sided (bursal group) tears. Both groups were comparable in age, gender and pre-operative scores. At 12 months, the bursal group had better pain score of 0.87, compared to 1.98 (articular group) (P=0.026) and a better Oxford shoulder score (OSS) of 15.10, compared to 19.71 (articular group) (P=0.011). However, the difference of 4.61 is less than the minimal clinically important difference of 6 for the OSS. These differences were not significant at 3 and 6 months. At 3, 6 and 12 months, there were no statistical differences in Constant and UCLA shoulder scores, strength, patient satisfaction and the meeting of expectations between the 2 groups. Comparing preoperation with 12 months post-operation, there were significant improvements in OSS, Constant and UCLA shoulder scores, pain and range of motion in both groups (P < 0.001). Although the articular group had inferior OSS and pain at 12 months, both groups achieved similar good clinical results, patient satisfaction and met patient's expectations.

Abstract no.: 47670 A RANDOMISED TRIAL COMPARING ROLE OF INJECTION CORTICOSTEROID AND INJECTION PLATELET RICH PLASMA(PRP) IN SUBACROMIAL BURSITIS

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This randomized control study was performed to compare the outcomes of Platelet Rich Plasma (PRP) and Corticosteroid injection in subacromial bursitis.60 Patients with Subacromial bursitis, 18 and 75 years of age, with unilateral symptoms were included. One group was administered USG guided subacromial corticosteroid injection and the other group received injection 5 ml PRP. Clinical Outcome measures (VAS Score, DASH and Constant Score) were assessed at 6 weeks and 3-6 months after injection. Radiological evaluation was done after 3-6 months by Dynamic ultrasound, X-rays and MRI. The mean age of the patients included in this study was 43.5 ± 11.9 yrs. In the PRP group, the mean VAS/DASH/Constant score was 7.0/ 66.9/ 34.5 at baseline, 5.4/ 55/ 48.3 at 6 weeks and 2.7/33.4/68.1 at 6 months, whereas in the steroid group it was 7.1/68.7/ 32.8 at baseline, 4.1/ 34.9/ 60.6 at 6 weeks and 3.6/ 37.3/ 59.1 at 6 months. The MRI changes were statistically significant in PRP group as compared to the Corticosteroid group (p = 0.010). The Dynamic ultrasound changes were statistically significant in both the groups. Injection corticosteroid was found to be better than PRP at the 6th week postintervention suggesting that corticosteroid injection has an early onset and a short term effect. However, although PRP was found to have delayed onset of action, it was better in the longer follow-up as compared to Corticosteroid.

Abstract no.: 46835 DURATION OF IMMOBILIZATION AFTER DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH) OPEN REDUCTION SURGERY

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Background: There is no consensus about the duration of post operative immobilization in the treatment of DDH. Our aim in this study is to compare between two post-operative immobilization protocols with different duration of immobilization in patients undergoing open reduction. Materials and methods: 38 hips in 32 patients assigned to group A were immobilized in hip spica for 4 weeks followed by abduction brace application which was gradually weaned through the periods of several months and 29 hips in 24 patients assigned to group B immobilized in hip spica for 12 weeks without further bracing. Both groups were surgically reduced using anterior approach between the ages of 12-24 months (mean 16 months) and followed for a mean of 11.75 years (range 8-16 years) without concurrent bony surgeries Results: Non significant statistical difference between both groups as regard clinical and radiological outcome but there is significant statistical difference as regard AVN on follow up between both groups. Two cases of group B were complicated by Skin ulceration and also hip stiffness was noticed in 3 cases of the same group. Conclusion: group A postoperative immobilization protocol is safer and associated with less complications and more comfortable to the patient and parents than that used in group B.

Abstract no.: 47186 HIGHER INCIDENCE OF FEMORAL NERVE PALSY AFTER PAVLIK HARNESS TREATMENT FOR DEVELOPMENTAL DISLOCATION OF THE HIP

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Introduction: Early treatment with the Pavlik harness for developmental dysplasia of the hip (DDH) is highly successful, especially, if started immediately after birth. Uncommon yet clinically important complication of Pavlik Harness treatment is Femoral nerve palsy which, if missed, may lead to significant disability and can result in early termination of treatment. Few previous retrospective studies have assessed this complication and the incidence was reported to be 1 to 2.5 %(1-4). Patients and methods: We performed a prospective review of all patients who underwent Pavlik harness treatment for DDH over a two-year period at our institution. Results: All cases treated with Pavlik splint were graded as Graf grade II--IV with a total number of 98 patients. 5 patients developed early signs of femoral nerve palsy with weak active knee extension. Risk factors identified in this study included delayed presentation, high Graf grade and Ortolani's positive. Conclusion: This is a higher incidence than previously reported in English language studies and possibly reflects a more accurate incidence of femoral palsy in patients presenting relatively later for diagnosis and initiation of treatment. Femoral nerve palsy is a serious and rare complication of the treatment which is difficult to predict. However, early recognition (including parents and carer education) and management of this problem may improve the success of DDH treatment overall.

Abstract no.: 48418 APPLICATION OF ANTEROLATEAL APPROACH IN THE TREATMENT OF FEMOROACETABULAR IMPINGEMENT OF THE HIP

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Purpose : Ganz surgical hip dislocation is popular procedure in the management of femoroacetabular impingement. We report the usefulness of anterolateral approach (Watson-Jones approach) in the management of femoroacetabular impingement in the various hip disorders. Method: Seventeen hips of 16 patients (mean age at the time of operation; 18.75 years) with femoroacetabular impingement were treated using anterolateral approach: 10 Legg-Calvé-Perthes disease, 3 avascular necrosis of femoral head of developmental dysplasia of hip, 3 slipped capital femoral epiphysis and one arthritis. Combined procedure included 5 double pvogenic oblique slidina osteotomy(DOSO) in the proximal femur, 16 greater trochanter osteotomy, 3 varus/valgus femoral osteotomy(VFO) and two pelvic osteotomy. Clinical results were evaluated using Modified Harris Hip Score(MHHS) and Non-Arthritis Hip Score(NAHS). Result: MHHS improved 57.2 points to mean 78.4, NAHS improved 62.5 points to mean 86.4. Hip flexion range improved from a preoperative mean 82.4° to a mean of 112.8°. No avascular necrosis of the femoral head was noted up to the time of the latest follow-up visit. Conclusion: Anterolateral approach (Watson-Jones approach) is a useful approach in the management of mild or moderate anterolateral femoroacetabular impingement, enabling other procedures in the proximal femur simultaneously with or without hip dislocation.

Abstract no.: 48403 MID-TERM RESULTS OF PAVLIK HARNESS TREATMENT FOR DEVELOPMENTAL DYSPLASIA OF THE HIP

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Pavlik harness has been used widely to treat developmental dysplasia of the hip(DDH) in patient between 0 and 6 months of age. However, factors associated with favorable outcomes have not exactly been determines. Between 2002 and 2011, we treated 77 hips in 64 children with DDH using Pavlik harness. 53 patients (64 hips, 11 bilateral), whose initiation ages of treatment were less than 6 months and follow-up periods were at least 24 months, were included. Patients were divided two groups by the treatment outcome. Treatment was considered successful when α angle showed 60° and more in follow-up examinations. The anteroposterior (AP) radiographs at the last follow-up was analyzed to determine residual acetabular dysplasia. Abnormal acetabular index (AI) (≥ 25°) or abnormal acetabular angle (AA) (≥ 47°) was considered acetabular dysplasia. In successful group (56 hips), treatment was initiated at the average age of 55.1 days (range, 1-171). Mean follow-up period was 53.16 months (range, 24-102) and 4 hips showed residual dysplasia (7.1%). In unsuccessful group (8 hips), treatment was initiated at the average age of 109.12 days (range, 11-203). Mean follow-up period was 69.63 months (range, 39-103) and 1 hips showed residual dysplasia (12.5%). Between two groups, initial alpha angle and treatment period were not different (paired t-test; p=0.096, 0.256) except the initiation age of Pavlik harness (paired t-test; p=0.011). For the successful Pavlik harness treatment, early diagnosis is essential. Even if the initial treatment is succeeded, care should be taken finding late residual dysplasia in long term follow-up.

Abstract no.: 48234 THE EFFECT OF SCREENING POLICIES ON AGE AT DIAGNOSIS AND RATES OF SURGERY IN DEVELOPMENTAL DYSPLASIA OF THE HIP (DDH): A BI-NATIONAL STUDY

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This study aims to compare 1) the demographic characteristics and method of diagnosis of DDH at two centres from two culturally different countries, and 2) the subsequent effect on age at diagnosis and need for surgical intervention. The official criteria for an ultrasound scan referral in Israel and UK is equivalent however the experience of the clinician performing the post-natal examination is often significantly different. A database search identified consecutive primary closed and open reductions performed at two comparable referral centres over a twenty-year period (1996 - 2016). 297 patients were included in this study: 150 from Schneider Children's Medical Centre (SCMC) and 147 from St George's Hospital (SGH). A case note review collected data that included patient demographics, presence of DDH risk factors, age at diagnosis and means of diagnosis (clinical vs. ultrasound). The presence of DDH risk factors was found to be comparable. 59% from SGH and 51% from SCMC did not have any risk factors. Significant differences were found in the means of diagnosis (SGH: 94% clinical vs. SCMC: 47% clinical), mean age at diagnosis (SCMC: 14 weeks vs. SGH: 47 weeks) and rate of open reduction (SGH: 65% vs. SCMC: 12%). Our study found that the majority of patients undergoing surgery for DDH had no known DDH risk factors. Failure to identify positive clinical findings during the postnatal examination resulted in delayed diagnoses. This delay necessitated an increased need of open reduction procedures. A change in approach to screening for DDH should be considered.

Abstract no.: 47231 CLOSED REDUCTION AND PERCUTANEOUS PINNING OF SUPRACONDYLAR FRACTURE HUMERUS IN CHILDREN WITH WARM PULSELESS HAND

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Introduction: Supracondylar fracture of humerus is a common injury in children. Neurovascular injury is a serious complication. Ischemia, amputation and Volkmann's contracture are the most serious potential end-points of vascular injury. Exploration of the brachial artery in a warm pulseless hand is a debatable issue. Patients and methods: A prospective study of children with Gartland III surpracondylar fracture with warm pulseless hand (6/2015-5/2016) were conducted. Children with cold pulseless hand were excluded. Mean age was 4.2years (2-10). Closed reduction and percutaneous pinning were done using divergent lateral wires, postoperative long posterior splint was applied for three weeks. Duplex ultrasound examination of radial artery was done postoperatively, and on the fifth day in all cases. Cases with no distal radial flow were weekly followed by clinical and duplex examinations till the 4th week. Children were evaluated for neurovascular assessment, range of motion, deformity and stiffness. Results: Thirty patients were involved in the study. Pulse did return immediately postoperative in 13 patients, in first day in nine, in 2nd day in four, in 3rd day in two, after one week in one, and after three week in one patient. Radiological healing was proved at three weeks in 23 and at four weeks in seven patients. Conclusion: Children with Supracondylar fractures of the humerus with warm pulseless hand have favorable outcome after satisfactory closed reduction and pinning, and do not necessarily require exploration of the brachial artery. However, surgical exploration of the artery is mandatory once clinical evidence of ischemia is present.

Abstract no.: 47229 POSTEROMEDIAL APPROACH TO THE DISTAL HUMERUS FOR TREATMENT OF THE MEDIAL COLUMN FRACTURES IN CHILDREN Ahmad Ibraheem ADDOSOOKI, Ahmed ABDELAAL, Ashraf Rashad MARZOUK, Ahmed Saleh Shaker SLEEM, Moustafa Ismail ELSAYED, Ahmad Fawaz MORSY Sohag University Hospital, Sohag (EGYPT)

Medial condylar and epicondylar fractures in children have many difficulties during exposure and fixation using direct medial approach; difficult exposure of the ulnar nerve, difficult access to the fracture site, disruption of the ulnar collateral ligament, difficult insertion of K wires through the skin, presence of the scar over the bony prominence is also disfiguring. We describe posteromedial approach to avoid these drawbacks. Surgical technique. Lateral position is used, with the elbow is flexed on arm support. A sterile tourniquet is used. A longitudinal incision about 4 cm long is made midway between the olecranon and medial epicondyle, if the fracture is associated with dislocation closed reduction is performed before exposure. The ulnar nerve is identified and displaced medially. The displaced medial epicondyle is reduced under direct vision, and held temporary by pointed forceps, then fixed by K. wires or cannulated screw with washer. Avoid drilling into the olecranon fossa. Radiographs are obtained to assure reduction of the medial epicondyle and appropriate K. wires or screw position, the tourniquet is released and haemostasis is achieved. Closure of subcutaneous and skin is performed. The arm is placed into a well-padded splint with the elbow at about 80° of flexion and the forearm in pronation for 4 weeks and elbow motion is started. Conclusion: Posteromedial approach to the distal humerus is easy, extensile, allow excellent exposure of the ulnar nerve, suitable for fixation by K. wires or screws, avoid incision placement over a bony prominence, and cosmetically accepted.

Abstract no.: 48797 MANAGEMENT AND OUTCOMES OF MULTIDIRECTIONALLY UNSTABLE GARTLAND IV PAEDIATRIC SUPRACONDYLAR FRACTURES – A SYSTEMATIC REVIEW Grace YIP¹, Krishna BODDU², Sandesh LAKKOL¹ ¹Lewisham and Greenwich NHS Trust, London (UNITED KINGDOM), ²Lewisham and Greenwich NHS Trust, ipswich (UNITED KINGDOM)

Background: Severely displaced supra condylar fractures with loss of posterior periosteal hinge are multidirectionally unstable and are described as Gartland Type IV fractures. We aim to systematically review the existing literature related to management of these fractures. Methods: The electronic search was performed using Ovid SP to include MEDLINE, AMED, EMBASE, Cochrane Library and Journals @ Ovid was performed from 1946 to October 2016. The quality of studies was assessed using McMaster University critical assessment form. Results: Initial literature search identified 562 articles. A thorough selection process by two reviewers identified only three studies involving 29 patients that reported the management of Gartland type IV fractures. The mean age of patients was 6.4 years. Closed manipulation was successful in 66% of patients whereas open reduction was required in 34%. Lateral pinning alone was sufficient in 76% of patients and 24% required additional medial pinning. There were four (14%) complications including two nerve injuries, one avascular necrosis of trochlea and one unsatisfactory clinical outcome. Two of three studies have described specific techniques of closed reduction. Conclusion: Gartland type IV fractures rare injuries in children and poses significant challenge to surgeons. However, in reported studies majority of the fractures can be treated by closed reduction and lateral pinning by following special reduction techniques. Identification of these injuries is crucial to employ such techniques and avoid complications. Implications. To our best knowledge, this is the first systematic review on management of extremely unstable gartland type IV paediatric supra condylar fracture.

Abstract no.: 48003 COULD TRANSIENT FIXATION OF LUMBAR INSTRUMENTED VERTEBRA PRESERVE THE LUMBAR MOTION IN LENKE TYPE C? Hak Sun KIM¹, Seungjin CHOI¹, Hwan Mo LEE¹, Joong Won HA² ¹Yonsei University, Seoul (SOUTH KOREA), ²National Health Insurance Service Ilsan Hospital, Ilsan (SOUTH KOREA)

INTRODUCTION: No consensus about LIV selection has been achieved and some guidelines still do not provide sufficient evidence. The purposes are to analyze prospectively the patient who temporarily fixed the lowest instrumentation vertebra (LIV) in adolescent idiopathic scoliosis(AIS) of Lenke Class C and also to evaluate radiologically whether the lumbar motion is preserved. METHODS: This study was conducted on the 10 patients with AIS of Lenke Class C, who were treated with transient fixation at the 4th lumbar vertebra as LIV and fixation removal after 6months. Minimal follow up was at least 2 years. This study assessed the degree of correction and the motion range of lumbar vertebra through standing PA and flexion-extension lateral radiographs at 3 junctures: preoperation, index operation, fixation removal. Facet joint degeneration was evaluated using CT grade system. RESULTS: Thoracic, lumbar Cobb angle, thoracic AV-CSVL distance, Lumbar AV- CSVL distance, LIV-CSVL distance, LIV tilt showed significant decrease after surgery (p<0.05): Preoperative LIV tilt (15.66 \pm 3.0°), after index operation (5.03 \pm 2.8°), after fixation removal (2.7 \pm 1.80°). The fixation extension angles L4/S1 were measured: preoperative ROM (30.45 \pm 7.50°), after index operation (22.35 \pm 7.1°)

, after fixation removal (31.42±6.7°). In all patients, 3/4 facet degeneration was classified as grade 0 before operation. After fixation removal, facet joint degeneration in one patient is developed on lumbar level of transient fixation. CONCLUSIONS: Though we only fixed LIV transiently, we could achieve improvement of coronal balance as well as lumbar motion preservation. Transient fixation of LIV can be the option of treatment in Lenke type C.

Abstract no.: 46238 CORRELATIONS OF SERUM LEPTIN, ADIPONECTIN AND RESISTIN LEVELS WITH BODYWEIGHT AND GMFCS CLASSIFICATIONS IN CHILDREN WITH CEREBRAL PALSY

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Introduction: The incidence of obesity is increasing including in children with cerebral palsy (CCP). The levels of serum adipokines, an adipocyte hormone, alter in obesity that leads to several healthcare burdens. The aims were to study the correlations between serum adipokines levels, bodyweight and functional statuses in CCP. Methods: 72 CCPs (males; 38 and females; 34) with a mean age of 8.7±1.9 (range, 4.6-11.8) years were enrolled. Patient characteristics including the Gross Motor Function Classification System (GMFCS) class were obtained. CCPs were divided into three groups (thinness, normal and overweight) based on body mass index (BMI). Serum levels of adipokines (leptin, adiponectin and resistin) were measured. Data were compared among the three groups using ANOVA. Correlations between serum adipokines, and BMI and GMFCS classifications were evaluated. Results: The prevalence of overweight is 24% (17/72). CCPs with overweight were younger and had thicker triceps skinfold than the other two groups. GMFCS was graded as class 2, 3, 4 and 5 in 9, 30, 24 and 9 CCPs, respectively. CCP in the overweight group showed higher levels of serum leptin but lower levels of serum adiponectin and resistin. Only serum of leptin and adiponectin were significantly correlate with BMI. Serum adipokines were not significantly correlated with GMFCS classification. Conclusions: Serum levels of leptin and adiponectin were correlated with BMI. CCPs' care should include a plan that aim to control weight and optimize levels of serum adipokines to avoid metabolic consequences, as it should improve quality of life of CCP in long term.

Abstract no.: 48771 THE EFFECT OF SPINAL DEFORMITY SURGERY ON PNEUMONIA AND PULMONARY FUNCTION IN PATIENTS WITH NONIDIOPATHIC SCOLIOSIS

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Introduction: Mechanical lung compression secondary to chest deformity leads to restrictive findings in the pulmonary function (PF) of patients with nonidiopathic scoliosis. The purpose of this study is to determine the effect of spinal deformity surgery on the risk of pneumonia and subjective measure of PF. Methods: Patients undergoing growthfriendly instrumentation or spinal fusion \leq 18 years of age with a minimum 2 year follow-up were included. Unvaccinated and immunosuppressed patients were excluded. Clinical charts were reviewed and a comprehensive medical questionnaire was completed by the patient caregiver. Quality of life was measured using the Early Onset Scoliosis Questionnaire (EOSQ-24) PF subdomain. Results: 40 patients were identified, with a mean age of 7.8 (63% male) and mean follow up of 3.8 years. 67.5% (27/40) of patients developed pneumonia at one point prior to spinal deformity surgery. In the 2 year period prior to surgery, the incidence of pneumonia was 20.0%, compared to 25.0% in the 2 year period following surgery (p>0.05). EOSQ-PF domain scores increased from 61.9 preoperatively to 80.3 postoperatively, exceeding the minimal clinically important difference of 10%. 57.5% of caregivers believed PF improved following surgery, and 40% believed it was unchanged. Risk factors for pneumonia included neuromuscular etiology (OR 8.6), seizures (OR 8.4), respiratory aid use (OR 7.4), and gastrostomy (OR 2.0). Conclusions: There was no significant change in the incidence of pneumonia following spinal deformity surgery. However, the improvement in EOSQ-PF domain scores demonstrates a meaningful improvement in guality of life following surgical intervention.

Abstract no.: 46899 EVALUATION OF ACCURACY OF VIRTUAL SURGICAL PLANNING FOR PRE-CONTOURED PLATES IN ACETABULAR FRACTURE FIXATION Tarun VERMA Maulana Azad Medical College and Lok Nayak Hospital, New Delhi (INDIA)

Background: Open reduction and internal fixation remains the standard treatment for displaced acetabular fractures to achieve anatomical reduction. Proper evaluation and surgical planning is necessary to achieve these goals. The goal of this study was to evaluate the outcomes of using virtual surgical planning and patient specific virtually precontoured plate in comparison with the conventional method of intra-operative contouring of reconstruction plate. Methodology: 25 patients were categorized into group A and B by computerized randomization. In group A, CT based virtual surgical planning was done using Mimics and 3-Matic software to form virtually pre-contoured plates, which were 3D printed to act as templates over which reconstruction plates were contoured preoperatively and used for fixation. In group B, conventional method of intra-operative contouring to adapt the plate to the fracture region was followed. Blood loss, surgical time, reduction on x rays and post-operative CT scan were compared between two groups. Results: Duration of surgery and total blood loss were found to be less and reduction was found to be satisfactory/anatomical in higher percentages of Group-A than Group-B patients. Conclusions: Virtual surgical planning, patient specific virtually pre-contoured plates and 3D printing technology improve the outcomes of acetabular fracture surgery by reducing duration and invasiveness of surgery and improving the quality of reduction.

Abstract no.: 48688 OUTCOME ANALYSIS OF MANAGEMENT OF PELVIC RING FRACTURES IN EMERGENCY: CONSERVATIVE VERSUS SURGICAL, AT LEVEL III TRAUMA CENTRE IN INDIA Manish Kumar SHARMA¹, Sunil Kumar DASH¹, Sanket MISHRA¹, Deepankar

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Introduction: The pelvis is strong, stable three dimensional central pivot of the body. It is often injured in high velocity trauma, and forms a formidable medical emergency with risk of visceral injuries and substantial internal hemorrhage, shock and sometimes death. Managing a case of pelvis injury in the emergency room in a Indian level III set up where resources, transportation and affordability of patients is questionable, remains a matter of challenge. Objective: To compare the clinical outcomes of emergency non-surgical and surgical treatment of such patients, to analyze the types and severity of complications and final functional outcome. Material and methods: 25 patients of pelvic fractures received at causality of our hospital in the period between November 2015 and November 2016. Results: The analysis of patients by using radiography showed, the outcomes were excellent in 17 (68%), good in 4 (16%), fair in 1 (4%) and poor in 3 (12%). The functional scoring according to D'Aubigne-Postel scale, on average 6 months were excellent in 12 patients (48%), good in 7 (28%), fair in 2(8%) and poor in 3 (12%). The surgical treatment efficiency-coefficient, compared with conservative, showed that all evaluated parameters were between 1.6 and 18.4 times lower in surgical treatment. Conclusion: conservative treatment is the treatment of choice for Tile's Type A fractures, for Tile type B external fixator forms major treatment of choice, for Tile type C internal fixation with plate and screw as mono therapy or in combination with external fixation.

Abstract no.: 48581 FACTORS AFFECTING FUNCTIONAL OUTCOME OF SURGICALLY MANAGED FRACTURE ACETABULAM

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Introduction: Acetabular fractures are complex, challenging fracture, often associated with other injuries, leading to significant morbidity and mortality to the patients if not treated adequately. Surgical treatment is recommended for displaced fractures to obtain anatomical reduction and stable fixation. We prospectively analyzed various complications and associated factors affecting functional outcome of operatively treated acetabular fractures.Method & Materials:Total 37 patients presenting with fracture acetabulam, 29 male and 8 female with an average age of 37.7 years, were enrolled in our study. All patients were managed by open reduction and internal fixation done by recon plate either at anterior column or posterior column or both column. Non weight bearing mobilization of fracture started as patients started tolerating pain. Full weight bearing was started after 12 weeks. All patients were followed up clinically as well as radio-logically at 6 weekly intervals. Functional outcome was accessed in terms of Harris Hip score and Merle D'Aubigne' scoring system. Results: All Patients were followed up minimally for 27 months, five patients were lost to follow-up, rest all fractures got healed at an average of 11.7 weeks with majority patient showed good to excellent results. Two patient developed heterotropic ossification, three patients developed superficial infection which were treated by extended course of antibiotic while two patient developed avascular necrosis, later managed by total hip arthroplasty. Conclusion: Despite of complications, optimum functional outcome of acetabular fracture can be achieved by timely surgical intervention involving open reduction, anatomical restoration and internal fixation followed by supervised physiotherapy.Key-words: Fracture Acetabulam,Harris Hip Score,Merle D'Aubigne scoring system.

Abstract no.: 48108 SACRAL FRACTURES WITH SPONDYLOPELVIC DISSOCIATION: OUR EXPERIENCE

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Introduction: spondylopelvic dissociation is a rare pattern characterized by a transverse sacral fracture in conjunction with bilateral fracture resulting in complete separation within the sacral bone. Severe neurological complications due to the damage of lumbosacral plexus may also occur. Spondylopelvic dissociations are usually misdiagnosed or underestimated, thus potentially leading to chronic low back pain and progressive deformity. An early diagnosis and treatment is the key of a good outcome. Methods: we report on 13 cases (7 females, 6 males) treated for traumatic spinopelvic dissociation between 2013 and 2017. Average age is 44 years (15-72 yrs). Eleven of them have fallen from heights and two have suffered a car accident. Fractures have been classified according to Denis's classification and morphological system. In five patients (38%) preoperatively neurological deficit were associated. Results: there were 8 "U-shaped", 4 "Lambda-shaped" fractures and 1 "H-shaped"; the S1-S2 levels were involved in 5 cases, the S2-S3 in 7 cases and S3-S4 in 1 case. In all patients multiple fractures occurred. Surgeries were meanly performed 8 days after the injury. In all but one patient a posterior spondylopelvic screw fixation was performed: three patients underwent decompression with laminectomy. At the mean follow-up of 13 months (1-39), one patient experienced wound problem. Conclusions: spinopelvic dissociation can be satisfactory treated with a posterior fixation, with or without associated laminectomy, thus minimizing the risk of neurological deficits, residual instability, deformities and chronic low-back pain. In our experience this procedure has been demonstrated safe and effective.

Abstract no.: 46822

MIDTERM RADIOLOGIC AND FUNCTIONAL OUTCOMES OF MINIMALLY INVASIVE FIXATION OF UNSTABLE PELVIC RING INJURIES USING AN ANTERIOR SUBCUTANEOUS PELVIC INTERNAL FIXATOR (INFIX) AND PERCUTANEOUS ILIOSACRAL SCREWS

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Introduction: Anterior pelvic external fixation is associated with pin site infection, aseptic loosening, frame bulkiness hindering patient mobilization and difficulties in inpatient nursing. We performed a single-center prospective series to evaluate feasibility, safety and midterm outcomes of an alternative minimally invasive pelvic internal fixation technique, using anterior subcutaneous pelvic internal fixator (INFIX) and percutaneous iliosacral screws in unstable pelvic fractures. Methods: Twenty-two patients with vertically and/or rotationally unstable pelvic fractures, presenting to a Level-1 trauma center were treated with closed reduction, appropriate posterior stabilization with percutaneous iliosacral screws and anterior INFIX application. Outcomes were analyzed by quality of fracture reduction, ease of nursing, patient comfort, functional outcomes (Majeed, SF-12 scores), social reintegration and complications. Results: Most common injury pattern was AO/OTA type 61-C fracture(n=16). Mean procedure time and intra-operative blood loss were, 57.1+/-5.1min(range,51-68 min) and 113.3+/-29.0 ml (range,70-170 ml) respectively. Mean follow-up was 34.9+/-4.1 months(range.31-42 months). Fracture reduction was excellent in eighteen, good in four patients. Functional outcomes were excellent in fifteen, good in seven patients (Majeed score). Mean SF-12 scores for physical and mental health were 48.58+/-5.61 and 50.89+/-3.97 respectively. Eighteen patients returned to their pre-injury jobs. INFIX was removed at a mean post-operative period of 7.3+/-1.5 months(range,5.5-11 months). Complications- lateral femoral cutaneous nerve irritation(n=1), superficial wound infection(n=1), loss of reduction(n=1). Conclusions: Minimally invasive stabilization using INFIX and percutaneous iliosacral screws is easy to learn and apply, achieves good fracture reduction and definitive stabilization with minimum complications and offers excellent functional outcomes at a minimum follow-up of 31 months.
Date: 2017-12-01 Session: Trauma of the Pelvis Free Papers Time: 16:00 - 17:30 Room: 03. Room 2.41-2.43

Abstract no.: 48411 IS INTERNAL FIXATION EFFECTIVE IN PUBIC SYMPHYSIS DIASTASIS?

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Introduction: Traumatic pubic symphysis diastases (PSD) is recognized as a high energy antero-posterior compression (APC) injury. Internal fixation for unstable pelvic ring injuries was a primary technique currently used. However, implants failure or recurrent diastasis of the pubic symphysis still occur in postoperative views. It is unclear whether there is correlation between radiographic distance changes and clinical outcome. Methods: We retrospectively reviewed 28 patients with traumatic symphysis pubis diastasis treated with internal fixation between 2007 and 2017. Routine anteroposterior radiographic review, pelvic fracture classification, associated injury, timing and mode of failure, and the complications were recorded after a minimum followup of 12 months. Results: Failure of fixation, including screw loosening, breakage of the symphyseal fixation, or recurrent disastasis over 2cm occurred in 5 of the 22 patients (23 %). The mean width of the pubic space measured 0.75 mm (range, 0.33-1.21 mm) on immediate postoperative radiographs; however, on the last radiographs, the mean was 1.09 mm (range, 0.35 - 2.9 mm), representing a 45% increase. However, only one of these patients required revision surgery due to wound infection and loss of reduction. Conclusion: Failure of fixation with recurrent widening of the pubic space can be expected after plating of then pubic symphysis for traumatic diastasis. A more secure fixation method or implants for Traumatic pubic symphysis diastases(PSD) is still an important issue in the future.

Date: 2017-12-01 Session: Trauma of the Pelvis Free Papers Time: 16:00 - 17:30 Room: 03. Room 2.41-2.43

Abstract no.: 48320 SCIATIC NERVE INJURY WITH FRACTURE ACETABULUM DOES EARLY SURGICAL MANAGEMENT AFFECT RECOVRY

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sciatic nerve injury may occur at time of dislocation.sciatic nerve injury may occur with stretching of the nerve over the dislocated head. Objectives The aim to assess nerve recovery in a series of patients treated with open reduction and internal fixation with plate for acetabulur fracture associated with sciatic nerve palsy. We find that surgical treatment with ORIF in emergency allows good nerve recovery Methods We conducted a retrospective study on 21 patients off of 45 acetabulur fractues operated between 2003 and 2015. The mean age was 51. The fractures dislocation were located in15 cases , . Mean delay for surgical treatment was two days (zero to 15). double plates were positioned at the posterior column in all patient in all cases sciatic nerve was continuous' Neurolysis was performed in seven cases (35 %). Results Fifteen patients (75 %) had a good nerve palsy recovery with a mean delay of nine months (six to 12). Statistically significant correlation was observed between delay of surgical treatment and delay of sciatic recovery (p:0'0166; Rho:- 0.53). Early osteosynthesis was correlated with better nerve recovery. One patient required complementary nerve surgery and another tendon transfer. Bone healing was obtained in all cases. Concerning functional outcomes, mean harris hip score were 86%, and 88 o% of patients were able to recover their previous physical activities' Conclusions ORIF by double plate of the acetabulur fracture with sciatic nerve palsy in emergency allows good palsy recovery (13%) with a short delay (about two days).

Date: 2017-12-01 Session: Trauma of the Pelvis Free Papers Time: 16:00 - 17:30 Room: 03. Room 2.41-2.43

Abstract no.: 46520 A NEW MINIMALLY-INVASIVE FIXATION TECHNIQUE FOR OPEN-BOOK INJURIES - A BIOMECHANICAL ANALYSIS

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Introduction: Pelvic fractures in adults are common injuries and accounted for up to 3,64% of all fractures. Goldstandard in the treatment of open book injuries (Type B1.1 and B1.2 AO-CCF-Classification), is an open reduction and plate fixation with dynamic compression and interlocking screws. These implants seem to enhance the level of outcome of such injuries, but also occur with complications, like hardware-failure and screw-loosening. To reduce complications and achieve an appropriate reduction and fixation, this study compared established stabilization techniques to a minimally-invasive internal fixator system (USS[™]-Fracture[®], Synthes), already utilized for spinal fractures. Methods: This study was performed on 32 composite pelvises in a bilateral-stance biomechanical model. stabilized by an internal fixator (n=8), a 4.5 DCP-steel-plate (n=8) and a 3.5 interlocking steel-plate (n=8). Reduction compatibility and loading forces were assessed by an I-Scan® sensor film inside the symphyseal gap as published in our previous studies. Results: This study showed significantly higher reduction and loading capabilities of the internal fixator compared to the other implants (p<0.05). This study also showed a significantly higher contact-area using an internal fixator compared to the other implants (p<0.05), also the 3.5 interlocking steel-plate showed a significantly higher contact area compared to the 4.5 DCP steel-plate (p<0.05). Conclusion: The minimally-invasive internal fixator already proven in spinal surgery is biomechanically superior to conventional implants used in pelvic surgery. The contact-area analysis furthermore shows a more physiological loading pattern. In all the current results warrant an in-vivo clinical analysis of the system, already underway at our institution.

Abstract no.: 47686 COMPARATIVE STUDY OF CT GUIDED PATIENT SPECIFIC JIG ASSISTED TKA AND CONVENTIONAL INSTRUMENTATION TKA Bushu HARNA Maulana Azad Medical College, New Dolbi (INDIA)

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BACKGROUND: Comparing the technology of CT guided jigs assisted surgery with conventional instrumentation system in restoring the mechanical axis in total knee arthroplasty. METHOD: Randomized two groups of 10 patients each were operated by Conventional instrumentation and CT guided pre-designed patient specific jigs(PSI). Intra and postoperative blood loss, operative time and correction of mechanical axis was recorded and compared. RESULTS: Mean rotational femoral angle was 1.0° for cases group and 1.5° for the control group, difference was statistically significant. The difference in preoperative and postoperative HKA angles between case and control groups were found to be significant in both groups but more in cases group. The alignment of knee in cases was closer to ideal 6 degree valgus alignment than the control group. The mean PCV fall in postoperative period in case group was 2.66 and in control group was 3.5. The mean operative time using CT guided jigs was 52.80 mins and that in control group using conventional instrumentation was 62.40mins. CONCLUSIONS: Restoration of alignment axis and placement of femoral component was found to be more accurate with CT guided jigs as compared to conventional instrumentation. Patients having extra articular deformity in femur which hampers the insertion of alignment rod properly to assess the anatomical axis are benefited by these patient specific jigs which obviate the need for intramedullary rod insertion. PSI is more precise as compared to conventional system but tibial jig placement requires improvement as it's less conforming than femoral jigs which can lead to intraoperative errors.

Abstract no.: 47610 IMPACT OF SIZE-SPECIFIC INSTRUMENTATION SETS ON PROCESS COSTS AND HANDLING COMPLEXITY

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Background: Increasing cost pressure induces hospital managers to shrink costs by a procurement strategy based on low-price-purchasing in order to gain guick out-of-pocket savings. On the other hand studies demonstrate process optimization to be the most effective way for achieving quality enhancement and sustainable cost containment simultaneously. Therefore, this presentation aims to identify the economic potential of sizespecific standardized sets for total knee replacements. Methods: The presentation reports about a comparative structural study, which is on one hand designed as a center-related before and after comparison with different surgical instrumentation set configurations. While the same set configurations were used in two centers ("Columbus Streamlined" versus "RESET"), other set configurations were used in a third center ("LCS" versus "Attune"). This design enables to test the robustness of a "best result instrumentation" setting". Based on a "generic process" description the research variables "activity time", "sub-process turn-around-time" and quantities of "OR trays", "instruments used" and costs were measured. Results: Using size-specific standardized instrumentation sets contributes significantly to reducing handling complexity, to shortening time requirements, to avoiding investments in reprocessing units, to gaining additional revenues and to avoiding staff overtime costs. Because of a potential time saving per day of 60 minutes an additional profit margin between EUR 300 and EUR 800 per OR day can be achieved. By using a "differential cost assessment" a saving potential of EUR 450.57 per total knee replacement procedure could be demonstrated.

Abstract no.: 46271 REVISION TOTAL KNEE ARTHROPLASTY FOR FAILED HIGH TIBIAL OSTEOTOMY AND UNICOMPARTMENTAL KNEE ARTHROPLASTY HAS SIMILAR CLINICAL OUTCOMES IN A 2-YEAR PROSPECTIVE FOLLOW-UP STUDY

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Introduction: With high tibial osteotomy (HTO) and unicompartmental knee arthroplasty (UKA) been increasingly performed, revision total knee arthroplasty (TKA) for failed HTO and UKA is expected to increase. The aim of this study is to evaluate if there are any differences in patient-reported outcome measures (PROMs) for TKA for failed HTO and UKA in a 2-year follow-up study. Methods: We retrospectively reviewed prospectively collected data of our hospital arthroplasty registry between 2001 and 2014 with minimum of 2 years follow-up. 217 patients and 75 patients were identified to have revision TKA for failed HTO and UKA respectively. Patient demographics (age, body mass index (BMI)), Short Form-36 (SF-36), Oxford Knee Score (OKS), Knee Society Score (KSS) and satisfaction were evaluated pre-operatively, at 6 months and 2 years post-operatively. An independent t-test was used to compare their outcomes. Statistical significance was defined as p <0.05. Results: Pre-operatively, both groups of patients with revision TKA for failed HTO and UKA were well matched in terms of age, BMI and baseline clinical scores (p>0.05). At 2-years follow-up, both groups of patients made significant improvement in terms of PROMs (p < 0.05). They also had similar OKS, KSS score and SF-36 (p>0.05) at 2 years. There was also similar proportion of patients who were satisfied with their surgery and had their expectations being met by surgery. Conclusion: Revision of failed HTO and UKA both achieve similar post-operative patient-reported outcome measures with high proportion of patients satisfied and had their expectations being met by surgery.

Abstract no.: 47782 RELATIONSHIP OF CORRECTABLE VARUS DEFORMITY WITH FEMUR EXTERNAL ROTATION IN PATIENTS UNDERGOING TOTAL KNEE COMPUTER ASSISTED SURGERY ARTHROPLASTY USING AND BETWEEN GAP MANAGEMENT COMPARISON AND MEASURED **RESECTION TECHNIQUES**

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The objective of this study was to do a comparative analysis of the relationship between correctable varus deformity in varus osteoarthritic knees with the amount of femoral external rotation in patients undergoing total knee arthroplasty(TKA) by computer assisted surgery (CAS) and analyze the differences in this relationship between gap management and measured resection techniques. Our study included 117 patients with 57 patients in group 1 (gap-management) and 60 patients in group 2 (measured resection). All patients in both the groups underwent primary, cruciate retaining TKA using CAS (Orthopilot 5.1) with sub-vastus approach. The amount of varus in extension, flexion, correctable varus and femur external rotation were measured. In group 1 the mean pre-operative varus in extension was 7.73 correctable to a mean of 2.19 +/- 2.44. The mean external rotation was 3.61+/-1.84. There was a positive correlation between correctable varus and external rotation (r=0.180) {statistically not significant (p=0.181)}. In group 2 the mean pre-operative varus in extension was 8.59 correctable to a mean of 2.87+/-3.64. The mean external rotation was 3.60+/-1.91. There was a positive correlation between correctable varus and external rotation(r=0.133) {statistically not significant (p=0.311)}. There was no statistically significant difference between the two groups with respect to correctable varus (p=0.245) and external rotation (p=0.968). Our study concludes that a positive correlation between correctable varus deformity and external rotation warrants a variable different resection angle based on individual anatomy to improve the femur rotation alignment, which is accurately possible using CAS, irrespective of the technique employed.

Abstract no.: 47693 GAP BALANCING IN COMPUTER NAVIGATED TOTAL KNEE ARTHROPLASTY

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One of the surgical goals of total knee arthroplasty (TKA) is to achieve equal, balanced gaps. Previous studies have used an arbitrary cut-off of >3mm difference between medial and lateral gaps, in extension or 90° flexion, to define outliers. However, there remains a lack of literature supporting this cut-off value of >3mm. This study aims to compare outliers to those with equal, rectangular gaps. Power analysis was done to calculate the required sample size. Between September 2008 and September 2011, 184 patients who underwent computer navigated TKA by a senior surgeon surgeon were included: 1) 90 patients had >3mm difference between medial and lateral gaps (outliers); 2) 94 patients had rectangular gaps (control). They were prospectively followed up for two years. Functional outcome was assessed using Knee Society Function Score (KSFS), Knee Society Knee Score (KSKS), Oxford Knee Score (OKS), Physical Component Score (PCS) and Mental Component Score (MCS) of Short-Form 36. Multiple linear regression was used for statistical analysis. Preoperative KSFS, KSKS, OKS, PCS and MCS were comparable between both groups (all p>0.05). At six months after TKA, the KSFS was 71 (95% CI 67,74) points in the control group compared to 65 (95% CI 61,68) points in the outlier group (p=0.026). At two years after TKA, there was no difference in KSFS, KSKS, OKS, PCS and MCS between both groups (all p>0.05). The authors recommend longer term studies to better understand the role of gap balancing in TKA.

Abstract no.: 46991 ROLE OF METAPHYSEAL SLEVEES IN SEPTIC REVISIONS OF TKR

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Introduction:Infected TKR's often present late and pose challenges due to severe bone defects and soft tissue laxity. Materials and Methods: 27 cases of TKR, 10 male and 17 female mean age 64.6 years presented with late infection. Average time lapse since diagnosis of infection was 175 days and all had massive tibial and femoral bone defects. All were subjected to 2-stage revision TKR. The first stage involved removal of infected implants, debridement of infected bone and soft tissues and implantation of antibiotic spaces. The second stage involved prosthetic implantation after normalization of ESR and CRP after 3 to 8 months. A tibial sleeve with stem was used in all cases and femoral sleeve in 14 cases. A rotating platform design was used in all cases. The patients were followed up for an average of 5.4 years.Results:All patients were mobilized with walker support on the first post operative day and were ambulant with a cane after 6 weeks. All had significant pain relief and knee flexion ranged from 75 to 110 degrees. Complications included one case of re-infection which was arthrodesed and one case of pathological fracture which was fixed and bone grafted. There was no cases of implant loosening or insert spin-off at the end of follow up. Conclusions: The metaphyseal sleeve is an effective tool to treat massive post ineffective tibial and femoral bone defects in revision TKR by restoring the defects, ensuring implant fixations and allowing satisfactory soft tissue balancing.

Abstract no.: 48415 TWO YEARS CLINICAL AND RADIOLOGICAL OUTCOMES COMPARING METAPHYSEAL SLEEVE VERSUS CONVENTIONAL AUGMENTS IN REVISION TKR: A MATCHED PAIR ANALYSIS.

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Background: Metaphyseal sleeves have been used as metaphyseal filling implants to address bone loss during revision TKRs. This study aims to evaluate the 2 years clinical and radiological outcomes of metaphyseal sleeve compared to conventional augments. Method: 17 cases of metaphyseal sleeve with stems were matched paired with 34 cases of augments and stems. They were matched for age, gender, Body Mass Index, and etiology for revision surgery. Clinical outcomes measures included Knee Society Knee Score (KSKS), Knee Society Function Score (KSFS), Oxford Knee Score (OKS), Physical component summary (PCS) and Mental component summary (MCS). Radiological outcomes measures included joint line changes, Hip-Knee-Ankle angle (HKA), coronal femoral angle (CFA) and coronal tibial angle (CTA). Result: There was no significant difference in age, gender, BMI and side of operated knee between the two groups. Patients in sleeve group showed significant improvement in KSKS, KSFS and OKS (38 ± 7, 35 ± 6 and 20 ± 2 points respectively, p <0.001) while they were 19 ± 3 and 6 ± 2 points for PCS and MCS respectively (p<0.001 and p=0.021). These post-operative scores after surgery were comparable between the two groups at 6 months and 2 years. The pre- and postoperative joint line measured, change in joint line, pre- and postoperative HKA, CFA and CTA were all comparable between the two groups. Conclusion: Metaphyseal sleeve is a viable option for revision TKR and able to achieve similar clinical and radiological outcomes compared to conventional stem and augment at 2 years follow-up.

Abstract no.: 47472 METAPHYSEAL SLEEVES IN REVISION TKA SURGERY: PROMISING MID-TERM RESULTS

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Introduction: The use of porous coated metaphyseal sleeves is, regarding their short-term results, one of the most promising options for implant fixation in revision total knee arthroplasty (RTKA). The aim of our retrospective study was to determine the durability as well as the clinical and radiological mid-term outcomes of metaphyseal sleeve fixation in RTKA. Methods: During a ten years' period 151 patients (153 knees) underwent RTKA using metaphyseal sleeves at our Department. Clinical and radiological follow-up examination could be performed in 87 Patients (89 knees). These examinations consist of range of motion, subjective satisfaction score (SSS), American Knee Society Score (KSS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), SF-36 Health survey, stem pain as well as a radiographic measurement to determine if successful osseointegration has been achieved. Results: SSS (2.5 to 7.3), WOMAC (38.6 to 72.6) and SF-36 PCS (24.9 to 37.6) improved significantly (p < 0.001) over the mean follow-up time of 4.2 years. 13 knees (14.6%) had to be re-revised (12 for infection, 1 for inlaydislocation), we did not encounter any cases of aseptic loosening. In 6 knees (7.9%) we detected an insufficient osseointegration. Of these 6, no one had to be scheduled for rerevision. Stem tip pain was found in 4 cases (3 tibial, 1 femoral). Conclusion: Metaphyseal Sleeves have shown very promising mid-term results regarding clinical scores, osseointegration and aseptic loosening. With this study, we can confirm the recently published short- and middle-term results indicating that metaphyseal sleeves are a reliable fixation option in RTKA.

Abstract no.: 46176 PREOPERATIVE KINEMATIC NAVIGATION FOR SURGICAL APPROACH CHOICE IN VALGUS TKR SURGERY

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In a "true" valgus knee the lateral femoral condyle is smaller in both the vertical and anteroposterior dimensions and lateral soft tissue structures are contracted. In a "false" valgus knee there is no mismatch between anteroposterior dimensions of both condyles. The purpose of the study was to preoperatively analyse patterns of passive movement of valgus knees with imageless navigation system to optimise surgical approach during subsequent total knee replacement (TKR). TKR were prospectively performed in 50 values knees. The kinematic analysis was performed by passive movement of the knee. The mechanical axis was recorded at 0°, 30°, 60°, 90°, and 120° of flexion. The valgus deformity persistent through the whole range of motion was called "true" and the valgus deformity passing into varus with flexion was called "false". The pre-operative valgus deformity in extension ranged from 13° to 4° (mean 7.8°). We observed "true" valgus type deformity in 34 cases (68%) and "false" type in 16 cases (32%). The mean difference between axis deviation in 0° to 120° range of flexion was 5.5° (range 10° to 1°) in the "true" valgus group. In the "false" valgus group the varus deviation was observed in 90° of flexion in all cases and mean difference between axis deviation in 0° to 120° range of flexion was 12.0° (range 14° to 10°). Computer navigation can identify the character of valgus deformity ("true" or "false") before skin incision. In "true" valgus deviation lateral approach may be necessary for appropriate soft tissue balancing during surgery.

Abstract no.: 48787 MECHANICAL SURVIVORSHIP OF HINGED KNEE ARTHROPLASTY FOR COMPLEX KNEE REVISIONS

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Introduction: Mechanical failure of hinge knees has been reported in literature as one of the major concerns. High stress levels at bone cement interface leading to aseptic loosening and component fracture as well as hinge failure have been noted. Methods: Retrospective review of clinical and radiological results of 71 consecutive patients with revision knee arthroplasty using hinge knee prosthesis (Stanmore SMILES System) between 2010 and 2014. Data was collected till the latest follow up. Mechanical failure due to any reason was considered as primary end point. The surrogate end point in our study was radiological evidence of aseptic loosening. Results: Mean age at index surgery was 65.4 years (range 42-84). The number of previous revisions ranged from 1 - 4. Most common indications for revision were infection (n=26) and instability (n=26). Majority of patients had rotating hinge knee (n=66). Average follow-up was 30 months (range 3-64). Three patients had re-revision for infection and one for extensor mechanism subluxation. Asymptomatic aseptic loosening of implant on femoral side was noted in 1 patient. There was no mechanical failure of implants apart from failure of circlip mechanism in 1 patient leading to backing out of hinge axle. Conclusion: This is the largest series till date reporting on mechanical outcomes of hinged knee implants for complex revisions. Although clip failure is of concern, there have been no other serious mechanical failures. Early results are encouraging, with no symptomatic aseptic loosening of implants to report.

Abstract no.: 48074 COMPARISON OF THE ACCURACY OF COMPUTER ASSISTED SURGERY ACHIEVING FINAL NAVIGATED IN COMPONENT ALIGNMENT IN TOTAL KNEE ARTHROPLASTY BETWEEN SEVERE (>15°) AND MILD-MODERATE (<15°) VARUS DEFORMITIES Krishna Kiran EACHEMPATI¹, Chandra Sekhar DANNANA² ¹... (INDIA). ²Max Cure Hospitals, Hyderabad (INDIA)

We did a retrospective comparative study of accuracy of Computer Assisted Surgery (CAS) in Total Knee Arthroplasty (TKA) in achieving final component alignment in varus deformities <15°(mild-moderate) and >15°(severe). A total of 121 patients out of 137 selected with varus deformity undergoing primary TKA were included in the final study. They all had Aesculap Columbus cruciate retaining design with sub-vastus approach using Orthopilot 5.1 B Braun image-free navigation system. The amount of varus deformity and correctable varus was recorded on the navigation screen after registering the kinematic hip knee, and ankle centres, medial soft tissue release and osteophyte removal, and patients were grouped accordingly into two groups. Group A (mild-moderate) included 95 patients with varus <15° (mean +/-SD 7.6°+/-4.6°; range 3-14°) and group B(severe) included 26 patients with varus >15° (mean+/-SD 18.4°+/-2.0°;range 15°-21°). All procedures were done by femur first measured resection technique and the final component alignment was recorded. Postoperative full length weight bearing scannograms were taken to calculate femoral component angle and tibial component angle and the final mechanical alignment. The final mechanical alignment was within 3° in 96.15 % of the patients in mild-moderate varus group and in 95.75 % in the severe varus group. This difference was not statistically significant (p>0.05). Our study shows that irrespective of the severity of deformity, with meticulous, sequential soft tissue release and using computer assisted surgery we can accurately quantify the degree of deformity, the amount of correction done and also achieve the desired, acceptable final component alignment.

Abstract no.: 47626 COMPARATIVE RESULTS OF 100 CEMENTED VS 100 CEMENTLESS NEW WAVETM TOTAL KNEE ARTHROPLASTY AT A MINIMUM FOLLOW UP OF 11 YEARS

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INTRODUCTION Since 1996 we have been using cementless fixation with hydroxyapatite (HA) coating .The purpose of this paper is to compare a series of 100 cemented TKA to similar series of 100 cementless with a follow up of 11 to 16 years. MATERIAL METHODS Both TKA are mobile bearing total knee postero-stabilized. They can be used with cement or without cement. Among 1030 NW TKA implanted from 2002 to 2015 we have identified 100 Cemented NW TKA implanted and 100 cementless NW TKA. All this cases were primary replacement. In all knees we have replaced patella . Differences in survival probability were determined using log-rank test. RESULTS Survival probabilities at 11 years of follow-up were: Cemented group: 90.2% CI95%[81.9-94.8] Cementless group: 95.4% CI95%[88.1-98.2] Comparison between both group was not significant, p=0.32. DISCUSSION The advantages of cementless TKA are bone stock preservation, cement debris protection and the potential to achieve biologic fixation of the implant to the bone. Cementless implants rely on a porous or roughened surface to facilitate bone formation. HA is a bioactive coating added to the metal of a cementless TKA. HA has been shown to accelerate bone integration and to decrease micro motion of the components and to increase fixation. With a survival probability of 90.2% (cemented version) and 95.4% (cementless version), this total knee prosthesis performs as intended in primary total knee arthroplasty. No statistical differences could be made between cemented and cementless NEW WAVE total knee prosthesis.

Abstract no.: 48830 COMPUTER NAVIGATED TOTAL KNEE ARTHROPLASTY: IMPROVED FUNCTIONAL OUTCOME AND PATIENT SATISFACTION WITH GAP BALANCING COMPARED TO MEASURED RESECTION Navnit MAKARAM¹, Nicholas CLEMENT¹, Jackie BELL², Christopher TIEMESSEN², Mehdi SYED ALI², Sara LIVINGSTON² ¹Royal Infirmary of Edinburgh, Department of Orthopaedics and Trauma, Edinburgh (UNITED KINGDOM), ²Department of Orthopaedics and Trauma, Borders General Hospital, Melrose (UNITED KINGDOM)

Aims The aim of this study was to compare the medium term functional outcome and patient satisfaction of gap balanced (GB) with measured resection (MR) total knee arthroplasty (TKA) using computer navigation. Patients and Methods A cohort of 144 consecutive computer navigated TKA were retrospectively identified from an arthroplasty database. Functional assessment using the Oxford Knee Score (OKS) and patient satisfaction were obtained from 113 patients at a mean follow up of 5.4 (range 4 to 7) years. There were 44 patients in the GB group and 69 patients in the MR group. Results The mean OKS for the GB group was 36.9 (SD 9.2) and for the MR was 33.6 (SD 9.8). with a difference of 3.3 (95% CI 0.3 to 6.3) points, which was statistically significant (p=0.01). Linear regression analysis confirmed the independent effect of surgical technique when adjusting for confounding factors, with the GB group achieving a greater post-operative OKS (R2=0.39, 3.0 points, 95% CI 1.2 to 4.8, p=0.001). There was a greater rate of patient satisfaction in the GB group (88.6%, n=39/44) compared to the MR group (81.1%, n=56/69), but this was not statistically significant (odds ratio 1.8, 95% CI 0.6 to 5.5, p=0.31). Conclusion Computer navigated GB results in a significantly greater functional outcome in the medium term and a trend towards a higher patient satisfaction rate when compared to patients undergoing a MR technique.

Abstract no.: 48083 INDIVIDUAL KNEE SPACERS CREATED WITH 3D TECHNOLOGIES.

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Two-stage revision arthroplasty remains the "gold" standard for the knee periprosthetic infection treatment. Between two stages it can pass a lot of time (up to 1 year and more) so there are some requirements to spacer. It should fully fill all bone defects and be articulating, relatively stable, and with prolonged releasing of effective antibiotics. "Officinal" spacers with thin femoral and tibial components can not always effectively fill defects and stabilize knee joint. We use 3D technologies for individual knee spacers production with following steps: 1. Multispiral CT scans of the affected knee with slice thickness no more than 1 mm in DICOM are sent to engineers. 2. Engineers process image and produce digital 3D bone knee model. 3. Engineers in coordination with the surgeon produce spacer digital model. Spacer should fully fill all bone defects and be articulating. 4. Engineers print spacer models from plastic on 3D printer and produce silicone spacer forms. Then silicone forms are cut. 5. During the surgery bone cement with antibiotics is filled into the forms. After cement polymerization individual articulating cement spacer with antibiotics is ready for implantation. We use this technology in 12 cases with knee periprosthetic infection. In 7 cases we have already done second stage of revision TKA. Among our patients were 2 cases of recurrent infection (16,6 %) and we have done spacer exchange. Other patients have good functional results.

Abstract no.: 47755 CAN WE REASONABLY SUGGEST A TOTAL ELBOW PROSTHESIS TO PATIENTS BELOW THE AGE OF 55?

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Aim : To evaluate the results and the survival rate of total elbow arthroplasty (TEA) on patients younger than 55 years. Background : It is allowed that the indication of TEA must be avoided among young patients, because of a potentially high rate of complications. Methods : From 1997 to 2015, 178 TEA were performed in our department, 34 on patients younger than 55 years. 17 patients with 19 TEA were included in our study: 13 women and 4 men of 46 years on average (29-54). A Coonrad-Morrey prosthesis was performed in all cases. Etiologies were: RA in 15, and traumatic sequelae in 4. Results : at 111 months average follow-up (29-189), MEPS reached 84 points (55-100) with 15 satisfactory results (79%) and 4 unsatisfactory results (21%). Radiographic analysis found humeral lucent lines in 6 (one complete), and ulnar lucent lines in 6 (all complete). Bushing wear was moderate in 4 and severe in 3. There were 12 (63%) complications leading to a revision surgery in 7 (37%): 2 TEA removal for infection, 1 axle changing, 2 bipolar revision, and 2 revision of the ulnar component. Survival rate was 84% at 5 years and 79% at 10 years. Conclusion : TEA on patients younger than 55 years is associated with a 79% survival rate at 111 months. The survival rate decrease significantly after the 5th year. Indication of TEA must be limited in young patients and must be discussed with other therapeutic options.

Abstract no.: 48133 MID-TERM OUTCOMES OF 77 MODULAR RADIAL HEAD PROSTHESES Pierre LAUMONERIE¹, Nicolas REINA¹, David ANCELIN¹, Meagan TIBBO², Nicolas BONNEVIALLE¹, Pierre MANSAT¹ ¹Pierre Paul Riquet Hôpital, Toulouse (FRANCE), ²Mayo Clinic, Rochester (UNITED STATES)

Introduction: Radial head arthroplasty (RHA) provides orthopedists with the ability to treat non-reconstructable radial head fractures. The goal of this study was to evaluate the midterm clinical and radiographic results of RHA.Methods: From 2002 to 2014, 77 radial head prostheses (RHP) (54 males and 23 females) with acute injuries (54) and traumatic sequela (23) of the radial head. Four RHP designs were included: GUEPAR® SBI-Stryker (36), Evolutive® Aston medical (24), rHead® SBI-Stryker (17) (RECON (10), STANDARD (7)). Mean follow-up was 74.03± 38.62 months (range: 24-141). Reasons for surgical reintervention, range of motion, mean Mayo MEPS, guickDASH, osteolysis and prosthesis positioning were also assessed according to RHP design and acute or delayed applications. Results: MEP and quickDASH scores were 90.20± 14 points (range: 45-100), and 14.04± 12 points (range: 1.2-52.5) respectively. There were no significant differences between RHA performed in acute or delayed fashions. There were 30 surgical reinterventions (19 with, and 11 without implant removal) during the first three years after implantation. Painful loosening was the primary reason for removal (14 cases). Short stemmed prostheses were associated with an increased risk of painful loosening (OR 3.54 (1.02-12.2), p= 0.045). Radiocapitellar instability was the primary reason for re-intervention with prosthesis retention (5). Overall, implant survival free from re-intervention was 60.8% ± 5.7% at 10 years. Conclusions: Bipolar and press-fit radial head arthroplasty produce unsatisfactory mid-term outcomes which may vary according implant design. The rate of re-intervention during the 3 first years is predictive of overall long-term survival in tightfitting RHP.

Abstract no.: 48547 LONG-TERM FOLLOW UP AFTER IMPLANTATION OF A BIPOLAR RADIAL HEAD PROSTHESIS VS. OSTEOSYNTHESIS TO TREAT COMPLEX RADIAL HEAD FRACTURES

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Aim: The purpose of the current study was to evaluate, if radial-head-fractures treated with a radial head prosthesis show inferior results to a reconstruction. Background: Radial head replacement is indicated for complex radial-head-fractures that are not treatable with open reduction and internal fixation. Methods: 52 patients with a radial-head-fracture were included. 26 patients treated with a Bipolar Radial Head Prosthesis (Group P), 26 patients treated with an osteosynthesis (Group O). Two subgroups each: 18 patients with isolated radial-head-fracture, 8 patients with a complex elbow trauma. Mean follow-up was 42 months Group P, 85 months Group O. DASH score, ROM measurement, Strength Test, Instability test. Results: mean DASH 27 (0-73) Group P 24,2 (0-76) Group O. For Group P mean pain level (0-10) 2.2 and 2.0 in Group O. Mean satisfaction level (0-10) 8.3 in Group P vs. 8.2 in Group O. In Group P extension gap in 22 patients (mean 10,8°), average flexion was 118°, mean motion arcs were 108°bflexion-extension and 144° in pronationsupination. Group O showed an extension gap in 21 patients (mean 16°), average flexion was 124°, mean motion arcs were 109° in flexion-extension and 155° in pronationsupination. Group P mean forearm strength was 64%. Group O mean forearm strength 50%. Conclusions: There were no significant differences evident within all examined parameters in-between both groups. This study suggests that a prosthetic replacement of the radial head is a non-inferior procedure to treat patients with a complex fracture of the radial head in comparison to an osteosynthesis.

Abstract no.: 48230 COMPARISON OF INTRA-ARTICULAR FINDINGS AND CLINICAL FEATURES BETWEEN PATIENTS WITH SYMPTOMATIC ANTERIOR INSTABILITY AFTER RECURRENT SHOULDER SUBLUXATION AND DISLOCATION

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The aim of this study was to compare the prevalence of concomitant intra-articular pathologies and clinical manifestations after arthroscopic stabilization between patients with symptomatic anterior instabilities following recurrent shoulder subluxations and dislocations. Among patients who underwent arthroscopic stabilization, 28 patients who experienced shoulder subluxations (subluxation group, 26.7±1.8 years) and 84 who had 25.9±2.2 years) were included. shoulder dislocations (dislocation group, The pathoanatomies in radiologic and arthroscopic examinations and postoperative clinical outcomes were compared. Number of instability events was significantly fewer in the subluxation group (5.0±1.3) than in the dislocation group (12.1±2.0; p=0.01). The pathologic findings in preoperative radiology demonstrated no intergroup differences, except for the prevalence of Hill-Sachs lesions (subluxation group, 28.6%; dislocation group, 63.1%, p=0.001). There were no significant differences in arthroscopic findings in both groups including SLAP lesion (subluxation group, 39.3%; dislocation group, 45.2%), ALPSA lesion (21.4%, 29.8%), and bony Bankart lesion (21.4%, 28.6%). Preoperative and postoperative functional outcomes also did not differ between the groups. There was no statistical difference in revision rate (p=0.149) and postoperative subjective instability (p=0.632). Patients who had anterior instability after recurrent shoulder subluxation demonstrated a similar rate of concomitant intra-articular pathologies requiring the same level of management as the recurrent shoulder dislocation. Recurrent shoulder subluxation also displayed similar functional outcomes and failure rate after arthroscopic stabilization procedures as recurrent dislocation. Thus, the clinical importance of symptomatic recurrent subluxation should be considered comparable with recurrent dislocation.

Abstract no.: 47924 ARTHROSCOPIC REMPLISSAGE FOR RECURRENT SHOULDER INSTABILITY Sahil SANGHAVI

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Background: A major risk factor for recurrent anterior gleno-humeral dislocation is the presence of an engaging Hill Sachs lesion, which can be treated by arthroscopic Remplissage procedure. The purpose of our study is to demonstrate if arthroscopic Remplissage can achieve good outcomes, without impairing shoulder function significantly. Materials & Methods: Twenty-one consecutive patients with recurrent anterior gleno-humeral dislocation, glenoid bone loss<20%, and engaging Hill Sachs lesion, were operated with arthroscopic Bankarts repair & Remplissage between 2013 and 2016. After an average follow up time of 33 months (range, 24-41 months), they were evaluated clinically for shoulder stability, range of motion (ROM) and scored as per Oxford shoulder instability score and University of California at Los Angeles (UCLA) score. Results: The average age of the patients was 30.48 years (range, 18-47 years), with 90.48% (n=19) males and 9.52% (n=2) females. The ROM at follow up was comparable to the normal side, with insignificant loss of external rotation of 3.33 degrees (P=0.062). Significant improvement was observed in the Oxford shoulder instability score (22.52 vs 40.71, P<0.001) and UCLA score (18.43 vs 30.00, P<0.001). A failure rate of 4.76% (one patient with a positive apprehension test) was seen. Conclusion: Arthroscopic Bankart repair with Remplissage procedure for recurrent anterior gleno-humeral dislocation with an engaging Hill Sachs lesion, helps to achieve good shoulder outcome and re-establish stability without significant impediment of function.

Abstract no.: 47900 OUTCOME OF BRISTOW-LATARJET PROCEDURE IN A GROUP OF MULTIDISLOCATORS

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The purpose of this study was to evaluate outcome of coracoid transfer described by Latarjet in a group of patients with history of multiple anterior dislocations of shoulder joint. It was a prospective research evaluating a homogeneous group of patients. Study included 45 patients with anterior shoulder instability that were operated with open procedure of Latarjet. Mean age of patient was 25 years old at the time of the surgery (SD 6+/-). Among 45 patients there was only one women. Outcome measures included returning to sport, Rowe Score, Walsch Duplay Score, Oxford instability Score, Constant Score and patient satisfaction (0, very unsatisfied; 10, very satisfied). ROM was measured in operated and compared to non operated shoulder. The data were collected prospectively analyzing medical documentation and on clinical examination before and at least 6 months after procedure. Mean number of dislocation and subluxations before the surgery was 19 (from 10-100). 100 episodes of subluxation reported patient whose time of instability duration was about 10 years from first dislocation. After Latarjet procedure none patients report any episodes of dislocation and feelings of instability. The analysis of decreased ER and IR after procedure was statistically significant compared to non damaged shoulders (p<0.001). Additionally age and number of dislocation had no influence on ROM after the procedure. Open Latarjet procedure is very effective method of management of anterior shoulder instability in active patients that require full stability for sport and every day activity.

Abstract no.: 48520 FACTORS ASSOCIATED WITH ATRAUMATIC POSTEROSUPERIOR ROTATOR CUFF TEAR

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Introduction: The causes of posterosuperior rotator cuff tear (PSRCT) are multifactorial and still under investigation. Recently, certain metabolic factors or metabolic syndrome (MetS) have been proposed as risk factors for PSRCT, but little information exists regarding its association with musculoskeletal problems. The purpose of this study was to determine the risk factors for atraumatic PSRCT by investigating the strengths of its associations with recently proposed metabolic factors and with MetS. Methods: This study involved 634 shoulders of 634 subjects from the general population. Each subject received a questionnaire, physical examinations, blood tests, simple radiographs and MRI evaluations of both shoulders, and an electrophysiological study of both upper extremities. Using logistic regression analysis, we calculated the odds ratios for various factors, including general physical factors, comorbidities, and serum metabolic parameters. P value was set at 0.05. Results: Age, BMI, dominant side, manual labor, diabetes, hypertension, hypo-high-density lipoproteinemia (HDLemia), and MetS were significantly associated with PSRCT in univariate analyses. Because MetS has possible multicollinearity with diabetes, hypertension, BMI, and hypo-HDLemia, we performed two different multivariate analyses. The first multivariate analysis included diabetes, hypertension, BMI, and hypo-HDLemia, while excluding MetS; we found that age, dominant side, diabetes, BMI, hypo-HDLemia, and manual labor were significantly associated with PSRCT. The second multivariate analysis excluded diabetes, hypertension, BMI, and hypo-HDLemia, but included MetS; we found that age, dominant side, manual labor, and MetS were significantly associated with PSRCT. Conclusions: Age, dominant side, manual labor, diabetes, BMI, hypo-HDLemia, and MetS are significantly associated with PSRCT.

Abstract no.: 48352 NEW QUANTIFICATION METHOD FOR THE FATTY INFILTRATION

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Fatty infiltration of the rotator cuff muscles is important factor that correlates with clinical outcomes after surgical treatment. Quantitative method for evaluation of fatty infiltration is more precise than Goutallier stage. However, one pixel in the image represents multiple myocytes. Therefore, there is a high possibility of loss of information by interpreting a pixel just as fat of muscle. The authors hypothesized that if a pixel is divided into 256 steps with gray scale rather than 2 steps, it will be more accurate by reducing the loss of information. Totally, 1962 MR images (T2, obligue sagittal image) were evaluated. One surgeon set ROI at the border of the supraspinatus muscle. We calculated average gray scale of ROI. The ROI was also measured by Goutallier stage and quantitative method. In order to simulate the interobserver and intraobserver variability, the fat and muscle were divided by gray scale 30, 50, 70 and 90. The average gray scale correlated with the Goutallier stage.(P<0.05) Each result of quantitative method showed significantly different.(p<0.05) However, all results of quantitative method were correlated with the new system.(P<0.05) The new grading system(average gray scale) is correlated with conventional method for fat infiltration measurement. The results are also finer than the previous method. In addition, unlike other methods, average gray scale method has no inter and intraobserver variables under a same image and ROI. This is the first report about technique for evaluation of fatty infiltration without dividing of ROI into fat and muscle.

Abstract no.: 48258 ASSOCIATION BETWEEN HIGH-NORMAL FASTING PLASMA GLUCOSE LEVELS AND POSTEROSUPERIOR ROTATOR CUFF TEARS

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Introduction: A fasting plasma glucose (FPG) level within normoglycemia has been proposed as a risk factor for rotator cuff tendon tear. However, no study has evaluated the association for the general population. Furthermore, no study has suggested cut-off value for FPG associated with posterosuperior rotator cuff tear (PSRCT). The purpose of this study was to determine the cut-off value for the FPG level within the normoglycemic range for which it becomes a risk factor for PSRCT. Methods: This study involved the 488 shoulders of 488 non-diabetic subjects from the general population. Each subject received a questionnaire, physical examinations, blood tests, and simple radiographs and MRI evaluations on shoulders. Using logistic regression analysis, we calculated the odds ratios (ORs) and 95% confidential intervals (CIs) for FPG level and various factors. We calculated the cut-off value for the FPG level, using the ROC curve. We performed multivariate analysis for the cut-off value for the FPG level, using the variables that were significant in the univariate analyses. Results: The cut-off value of FPG level for PSRCT was 87.50mg/dL, which is significantly associated with PSRCT (OR, 2.249 [95% CI, 1.350 to 3.745]; p=0.002). A high FPG level (>87.50mg/dL) was significantly associated with PSRCT in the multivariate analysis after adjustment with other significant variables noted in univariate analyses (OR, 2.187 [95% CI, 1.251 to 3.822];p=0.006). Conclusions: This study suggests that a high FPG level which is nonetheless normoglycemic is significantly associated with PSRCT. The cut-off value for safe FPG levels was relatively low (<87.50mg/dL).

Abstract no.: 47754 CLINICAL AND ANATOMIC RESULTS OF SURGICAL REPAIR OF CHRONIC ROTATOR CUFF TEARS AT 10-YEAR MINIMUM FOLLOW-UP. Pierre MANSAT, Fanny ELIA, Marine ARBOUCALOT, Julie LEBON, Amélie FARAUD, Nicolas BONNEVIALLE University Hospital of Toulouse, Toulouse (FRANCE)

Aim: To evaluate clinically and anatomically at 10 or more years, patients who underwent a surgical repair of chronic rotator cuff tears. Background: Clinical results after surgical repair of chronic rotator cuff tears are often satisfactory. However, anatomical studies have shown increase incidence of tendon re-tear with follow-up. Methods: 53 patients were reviewed at 10-year minimum follow-up. Rotator cuff tears were limited to one tendon in 34, and 2 tendons or more in 19. The tears were repaired totally in 45 and partially in 8. At follow-up, clinical and radiographic evaluations were performed for all patients as well as an MRI to control the quality of the repaired tendons. Results: At 11.4 years average follow-up (10-12), according to Constant score (74.7 points / 99.6%) satisfactory pain relief was maintained with improvement in range of motion and in strength in abduction. SSV was 82.5% with a SST score of 10 points. Radiographic analysis showed progression of degenerative lesions in 33%. MRI evaluation found a re-tear of the repair in 42%: 30% when only the supraspinatus tendon was initially involved, and 63% when 2 or more tendons were initially repaired. Age at surgery, tear size and guality of the repair were the most important prognosis factors for re-tear of the repair. Conclusion: Surgical repair of chronic rotator cuff tendon tear can produce consistent and lasting pain relief and improvement in range of motion. However, a 42% re-tear rate was observed at 11-year follow-up not correlated with degradation of clinical results.

Abstract no.: 46226 SERIAL CHANGES IN 3-DIMENSIONAL SUPRASPINATUS MUSCLE VOLUME FOLLOWING ROTATOR CUFF REPAIR

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Purpose: To evaluate the serial changes in supraspinatus muscle volume after rotator cuff repair by using semi-automatic segmentation software and to determine the relationship with functional outcomes. Methods: 74patients who underwent arthroscopic rotator cuff 3consecutive (preoperatively, PreOP; immediate repair and postoperatively,ImmPOP;and≥1year postoperatively,LaterPOP) MRIs having complete Yviews were included. We generated a 3D reconstructed model of the supraspinatus muscle by using an in-house semi-automatic segmentation software(ITK-SNAP) and calculated both 2D cross-sectional area and 3D volume at 3different views(Y-view,1cm medial to the Y-view(Y+1view), and2cm medial to the Y-view(Y+2view))at 3time points. LaterPOP volumes were compared with ImmPOP, and their relationship with various clinical factors, and the effect of higher volume increases on ROM, muscle power, and pain VAS and ASES scores was evaluated. Results: The interrater reliabilities were excellent for all measurements. The area and volumes increased at ImmPOP as compared to PreOP:however.only Y+1 and Y+2 volumes significantly increased at LaterPOP as compared to ImmPOP(p<0.05). After omitting the 9 healing failure cases. LaterPOP volume increases became more prominent(p<0.05) in the order of Y+2,Y+1,and Y-view. Volume increases were higher in successful healing cases with larger tears(p=0.040). Higher volume increases were associated only with increase in abduction power(p=0.029) and not with other outcomes. Conclusion: The supraspinatus muscle volume increased immediately postoperatively and continuously for at least 1 year after surgery. The increase was evident in patients who had larger tears and healed successfully, and when measured toward the more medial portion of the supraspinatus. The volume increases were associated with an increase in shoulder abduction power.

Abstract no.: 48054 WHICH IS BETTER BETWEEN CONVENTIONAL EN MASSE REPAIR VERSUS SEPARATE DOUBLE-LAYER DOUBLE-ROW REPAIR FOR THE TREATMENT OF DELAMINATED ROTATOR CUFF TEARS: A PROSPECTIVE RANDOMIZED STUDY

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Introduction : We compared clinical results between conventional en masse repair and separate double-layer repair for the treatment of delaminated rotator cuff tear. Methods : In group 1 (n = 48), arthroscopic conventional en masse repair was performed for delaminated rotator cuff tear. In group 2 (n = 34), separate double-layer double-row repair was performed. The ASES score, Constant score, Simple Shoulder Test score, and VAS score for pain and ROM were assessed before surgery; at 3, 6, and 12 months after surgery; and at the last follow-up. MRI was performed at 12 months postoperatively to examine the retear rate and pattern. Results : The mean follow-up period was 25.9 months. Significant improvements in functional scores were observed in both groups at the last follow-up. No significant differences were found between 2 groups at each time point, except that group 2 had significantly lower VAS pain scores (P<.05) at 3, 6, and 12 months postoperatively. Eight patients in group 1 and 6 patients in group 2 showed retear on MRI at 12-month follow-up (P > .05). Conclusion : Both conventional en masse repair and separate double-layer double-row repair were effective in improving outcomes in the treatment of delaminated rotator cuff tears

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Abstract no.: 47753 LONG-TERM RESULTS OF RESURFACING SHOULDER ARTHROPLASTY IN OSTEOARTHRITIS: RETROSPECTIVE MONOCENTER STUDY OF 100 CASES Pierre MANSAT, Julie LEBON, Fanny ELIA, Amélie FARAUD, Vadim AZOULAY, Nicolas BONNEVIALLE University Hospital of Toulouse, Toulouse (FRANCE)

Aim : Mid-term evaluation of resurfacing shoulder arthroplasty. Background : Despite the satisfactory results published by Copeland, several national registries have shown the degradation of clinical results after resurfacing shoulder arthroplasty with follow-up. Methods: A resurfacing shoulder arthroplasty has been performed on 100 patients (47 men/53 women) of 58 years (29-84) for primary OA (55) or secondary OA (45). According to Walch classification, glenoid wear was centered in 60 (46 A1 and 14 A2), non centered in 35 (27 B1 and 8 B2), excentered anteriorly in 2, and dysplasic in 3. Results : At 5-years (2-10) average follow-up, there were 32 complications : 23 symptomatic glenoid wear, 6 cuff lesions, 1 biceps synovitis, 1 capsulitis, and 1 nerve involvement. Survival rate without complication was 28.7% at 8 years. A revision was performed on15 patients, including 14 for glenoid wear, and one for cuff tear. Survival rate without revision was 59% at 8 years. No lucent lines were observed. SSV was 69%. Pain was equal to 2.7 compared to 6.8 preoperatively. Constant score reached 64.3 points, and quick-DASH score 26 points. Radiographic evaluation showed varus positioning of the implants with increase lateral offset. There was no correlation between implant positioning and glenoid wear, complication and revision rates. Conclusion : Functional results of resurfacing shoulder arthroplasty deteriorated with follow-up with only 75% satisfactory results at 5 years. Main concerns are related to recurrence of pain related to glenoid wear necessitating in most of the cases a revision procedure.

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Abstract no.: 47457 REVERSE TOTAL SHOULDER ARTHROPLASTY FOR CUFF ARTHROPATHY IMPROVES SHOULDER PROPROCEPTION

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Joint replacement affects the proprioception, as shown in studies. The aim was to evaluate shoulder proprioception following reverse total shoulder arthroplasty (RSA) for patients with cuff arthropathy. Methods 29 patients that underwent unilateral RSA and 31 healthy volunteers as control group were evaluated for joint position sense (JPS) of the shoulder using dedicated high accuracy electronic goniometer. Error of active reproduction of joint position (EARJP) was assessed at reference positions of 30°,60°,90°,120° for forward flexion and abduction; 15°, 30°, 45° for internal (IR) and external rotation (ER) in RSA, contralateral nonoperated and control shoulders. Range of motion of shoulder (ROM), shoulder strength, constant score, Active Daily Living External Rotation (ADLER) score were also assessed. Results Results of EPRJP for RSA, contralateral and control (respectively): -Forward flexion 30°=8.0±5.7;9.8±6.1and4.9±3.0; at at 60°=5,0±2,8;5,9±2,7and5,1±3,2;at 90°=3,1±1,6;5,5±2,6and 3.2±1,4;at 120°=3,4±2,1;5,6±4,0and 3,5±1,7;Abduction at 30°=5,2±2,5;9,1±6,1and 4,6±2,3;at 90°=3.8±2.0:7.4±5.5 60°=5.2±3.6:6.6±4.1and5.3±3.1:at 4.1±1.9:at and 4,2±1.9;IR 4,3±3,1;6,2±4,4and 120°=5,3±2,9;7,7±5,3 and at 15°=IR 2,8±1,2;at $30^{\circ}=3,2\pm1,9;4,5\pm2,3$ and $3,3\pm1,4;$ at $45^{\circ}=3,5\pm2,0;4,1\pm1,8$ and $2,8\pm1,0;$ ER at $15=3,0\pm1,7;$ 4,2±2,2 and 3,6±1,4;at

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Abstract no.: 46301 STANDARD VERSUS BONY INCREASED-OFFSET REVERSE SHOULDER ARTHROPLASTY. A RETROSPECTIVE COMPARATIVE COHORT STUDY

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Objective: To evaluate the clinical functional outcomes of patients received standard reverse shoul-der arthroplasty (RSA) compared with those received bony increased-offset RSA (BIO-RSA). We hypothesized that the BIO-RSA cohort would have lower notching rates and improved range of motion (ROM). Methods: Sixty-nine standard RSA and 61 BIO-RSA performed by a single surgeon were included into this retrospective comparative cohort study. At a minimum of 2 years' follow-up, outcomes included ROM and Constant score. Radiographs were obtained for all patients and examined for scapular notching, bony scapular spur, forming ossifications and healing of the graft. Results: The demographic data was not significantly different between the standard group and BIO-RSA group. At final follow-up, patients with BIO-RSA group indicated significantly better anterior forward flexion (AFF) than standard group (145.2 ± 20.5 degrees and 137.5 ± 20.2 degrees, P = .017, respectively). There was no significant difference of external or internal rotation between the 2 groups. Patients with BIO-RSA group had significantly higher Constant score than standard group (69.0 \pm 9.4 and 61.4 \pm 12.7, P < .01X, respectively). Evaluation with plain radiographs indicated no significant difference between the two groups. Conclusion: RSA significantly improved postoperative ROM and Constant score. Patients with BIO-RSA compare to standard group had better results in AFF and Constant score, but not in rota-tion. Results emerging from a compromise between glenoid and humeral lateralization have to be evaluated in future studies.

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Abstract no.: 48523 INDIVIDUALIZING HUMERAL RETROVERSION AND SUBSCAPULARIS REPAIR IN REVERSE SHOULDER ARTHROPLASTY DOES IT AFFECT THE FUNCTIONAL OUTCOME?

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INTRODUCTION: Outcomes after reverse shoulder arthroplasty can be affected by two factors: under surgeons' control and implant related. There are controversies regarding humeral component positioning in RSA and subscapularis repair. The purpose of study was to understand how the humeral component retroversion and subscapularis repair affect the functional outcome. METHODS: Total 80 patients were included(15 men, 65 women). Patients were divided into two groups according to the humeral retroversion: anatomical retroversion in Group I (n=52) and fixed 20° retroversion in Group II (n=28). The average implanted humeral retroversion in Group I was in 26.8° (range, $10^{\circ} \sim 40^{\circ}$) with respect to average native humeral retroversion of 28.0°. In Group I, subscapularis was repaired in 40 and irreparable in 12. Mean follow up was 15.5 (range 12 ~ 24) in Group I and 34.7 (range 13 ~ 53)months Group II. RESULTS: There was no statistical difference between two groups for pain VAS, functional scores, and ROM except internal rotation. Internal rotation at back was T10 level in Group I and T11 in Group II (p = 0.0017). Statistical analysis did not demonstrate any significant difference in pain VAS, ROM and functional outcomes scores with respect to subscapularis repair. There was no postoperative dislocation in the groups. CONCLUSION: The improvement in internal rotation was solely based on individualised anatomical humeral retroversion regardless of subscapularis repair without any compromise in external rotation. Subscapularis repair could provide a protective sleeve for the prevention of dislocation after RSA, even though further large study population is needed.

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Abstract no.: 48442

WHAT IS THE INFLUENCE OF GREATER TUBEROSITY (GT) HEALING ON CLINICAL OUTCOMES AFTER REVERSE SHOULDER ARTHROPLASTY (RSA) FOR ACUTE FRACTURE OF THE PROXIMAL HUMERUS ?

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Introduction: RSA with GT fixation is currently proposed to treat complex proximal humeral fractures. The aim of this study was to compare clinical outcomes in case of removal, failed fixation or anatomic healing of the GT. We hypothesized that GT fixation with anatomic healing would improve clinical results. Material and Methods: In a multicentre retrospective study, 420 RSAs for fracture were included with a mean follow-up of 28 months (12-60). Three groups were constituted according GT management and radiographic evolution: Group 1 (Gr1; n=169) with anatomic healing, Group 2 (Gr2; n=131) GT resorbed, mal-united or non-united and Group 3 (Gr3; n=120) with GT removed. Constant score and Simple Shoulder Value (SSV) were used for functional assessment. Results: The mean Constant score were 61pts 13, 54pts 15, 53pts 15 respectively in Gr1, Gr2, Gr3 (Gr1 vs Gr2 p<0.001; Gr2 vs G3 p=0.54; Gr1 vs G3 p<0.001). The mean SSV reached 75%15, 69%15, 56%15 in respectively Gr1, Gr2 and Gr3 (Gr1 vs Gr 2 p<0.001; Gr2 vs G3 p=0.004; Gr1 vs G3 p<0.001. There was a significant difference in active forward elevation and external rotation (120° vs 100° respectively in Gr1 vs Gr2 or Gr3 p<0.0001; 20° vs 6° respectively in Gr1 vs Gr2 or Gr3 p<0.0001). The rate of instability was higher in Gr3 (12%; p<0.001). Conclusion: The success of anatomic fixation with healing of GT around a RSA for acute proximal fracture improve clinical outcomes and decrease the risk of postoperative instability. The failure of fixation provides results similar to excision.

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Abstract no.: 47683 HUMERAL STEM LOOSENING FOLLOWING REVERSE SHOULDER ARTHROPLASTY - SYSTEMATIC REVIEW AND META-ANALYSIS Ben GREY¹, Reitze RODSETH², Steve ROCHE¹ ¹Princess Alice Unit, Groote Schuur Hospital, Dept of Orthopaedics, University of Cape Town, Cape Town (SOUTH AFRICA), ²Department of Anaesthetics, Grey's Hospital, University of KwaZulu-Natal, Pietermaritzburg (SOUTH AFRICA)

Aseptic stem loosening following reverse shoulder arthroplasty (RSA) is an uncommon complication. It remains unknown which factors contribute to aseptic stem loosening in RSA. Our analysis aimed to compare the incidence of aseptic stem loosening, humeral radiolucent lines (RLL) and revision for stem loosening between: 1) cemented and uncemented stems, and 2) different etiological subgroups. In a systematic review 75 articles were included and a meta-analysis of 1660 cemented and 805 uncemented stems was performed. We compared the incidence of aseptic stem loosening, humeral RLL, and revision for stem loosening between: 1) cemented and uncemented stems from cohorts with short (less than 5 years) mean follow-up periods, long (5 years or more) mean followup periods, and all cohorts combined; and 2) different etiological subgroups. Aseptic stem loosening occurred more commonly in cohorts with long follow-up times (2% vs 0.8%, p = 0.01). When comparing cemented to uncemented stems, there was no significant difference in the incidence of aseptic stem loosening or of revision for stem loosening in both the short and long term follow-up groups. Humeral RLL were more common with cemented stems (15.9% versus 9.5%, p = 0.002). The highest incidence of aseptic stem loosening occurred in the tumor subgroup (10.8%), followed by RSA as revision for failed arthroplasty (3.7%).

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Abstract no.: 48330 MID-TERM OUTCOME OF AFFINIS SHORT STEM ANATOMIC TOTAL SHOULDER REPLACEMENT: LARGEST SINGLE SURGEON SERIES OF 2 TO 6 YEAR FOLLOW UP.

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Introduction: Anatomic total shoulder replacement has been routinely performed for degenerative arthritis of the shoulder. There have been various advances in the design of the implant to overcome the problems of humeral component offset and Glenoid component loosening. The Affinis short stem total shoulder replacement (SS TSR) has been designed to overcome the above problems. The aim of this study is to report the outcome of the largest single surgeon series of Affinis (SS TSR). Methods: All patients who underwent the Affinis SS TSR, between January 2011 and December 2014, were identified from a database. All patients underwent the procedure by the senior author or a trainee under direct supervision of the senior author. The patients were followed up at 2 weeks, 6 weeks and then yearly thereafter. Oxford shoulder score (OSS) was completed pre-operatively, at 6 weeks and yearly thereafter. If a patient had not completed the OSS within the last year, a postal OSS was completed. Results: 82 Affinis SS TSRs were performed between January 2011 and December 2014. There were no cases of loosening of either the glenoid or humeral component in our series. There was good improvement in the oxford shoulder score at post-operative follow-up. Two of the SS TSRs were revised to an Inverse total shoulder replacement due to failure of the rotator cuff. Conclusion: Affinis SS TSR has a good mid-term outcome in our single surgeon series. Our series report good restoration of shoulder function and an improvement in shoulder scores.
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Abstract no.: 48226 REVERSE SHOULDER ARTHROPLASTY FOR FOUR-PART PROXIMAL HUMERUS FRACTURE IN ELDERLY PATIENTS: CAN A HEALED TUBEROSITY IMPROVE THE FUNCTIONAL OUTCOMES? Sang-Jin SHIN, In PARK, Jae-Hoo LEE, Hwan-Sub HYUN Ewha Womans University, Seoul (SOUTH KOREA)

The purpose of this study was to investigate whether healed tuberosities yield better rotational range of motion (ROM) and functional outcomes, compared to unhealed tuberosities after reverse shoulder arthroplasty in elderly patients with comminuted proximal humerus fractures. This study included 38 patients who underwent reverse arthroplasty due to four-part proximal humerus fractures. Fourteen patients had healed tuberosities (Group A) and 24 patients had unhealed tuberosities (Group B). Functional assessments including visual analog scale (VAS) pain score, Constant score, and active ROM were assessed. There were no significant differences in patient demographics between two groups. At the final follow-up, no significant differences were found between groups in VAS (Group A: 1.4, and Group B: 1.6, p=0.647), and Constant scores (67.9 and 63.9, p=0.228), and ROM with forward flexion and internal rotation. However, in external rotation, there was a significant difference between groups (29° and 10° in external rotation with elbow at side, p<0.001; 25° and 7° in external rotation with shoulder abduction, p<0.001). After reverse shoulder arthroplasty for four-part proximal humerus fracture, tuberosities were healed in an anatomic position in 37% of patients. However, there were no significant differences in functional outcomes and ROM between the two aroups, with exception of external rotation which was better in the healed tuberosity group. Therefore, the tuberosity healing is not a prerequisite for satisfactory outcomes after reverse shoulder arthroplasty for four-part proximal humerus fractures in elderly patients.

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Abstract no.: 47756 REVISION TOTAL ELBOW ARTHROPLASTY WITH A SEMICONSTRAINED HINGE PROSTHESIS: 33 CASES REVIEWED WITH 5-YEAR AVERAGE FOLLOW-UP

Pierre MANSAT, Julien TOULEMONDE, Marine ARBOUCALOT, Fanny ELIA, Stephanie DELCLAUX, Michel RONGIÈRES, Nicolas BONNEVIALLE University Hospital of Toulouse, Toulouse (FRANCE)

Aim : Evaluate the results of a non-custom semiconstrained total elbow arthroplasty (TEA) for revision of previous TEA. Background: Revision for failed TEA remains a surgical challenge with non reliable results and high rate of complications and revisions. Methods : 31 patients (33 elbows) were revised for failed TEA (7 men and 24 women of 61 years). Initial etiologies were: RA in 19, and traumatic sequela in 12. Delay between initial TEA and the revision procedure was 122 months (20-360). Indications of revisions were: bipolar loosening (14), unipolar loosening (10), infection (3), ulnar component fracture (1), and others (5). A Coonrad-Morrey prosthesis was used in all cases. A massive allograft was necessary in 2, and an autograft in 2. Results : At 58-months average follow-up (12-129), MEPS increased from 38 points preoperatively to 68 points at F/u, and guick-DASH score decreased from 69 to 45 points. Radiographic analysis showed lucent lines around the humeral component in 9 cases (1 loose) and around the ulna component in 8 (1 loose). Bone resorption was present around one allograft. There were 22 complications on 18 patients (55%): 5 ulnar nerve dysesthesia, 4 deep infections, 2 wound problems, 2 triceps insufficiency, 2 ulna fractures, 3 humeral fractures, 2 ossifications with proximal RUJ impingement, one hematoma, and one axle system disassembling. Conclusion: Revision TEA with a linked semiconstrained prosthesis is a complex surgery that can give satisfactory results but with a high rate of complications.

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Abstract no.: 46779 MORTALITY AFTER CONSERVATIVE AND OPERATIVE TREATMENT WITH REVERSE TOTAL SHOULDER ARTHROPLASTY FOR COMPLEX DISPLACED PROXIMAL HUMERUS FRACTURES IN THE ELDERLY Dani ROTMAN¹, Ornit GILADI², Ofir CHECHIK²

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Background: Proximal humerus fractures (PHF) are a common fragility fracture in elderly patients, and have been shown to increase mortality. Up until recently, elderly patients with complex displaced PHF were treated conservatively. In the last decade, reverse total shoulder arthroplasty (RTSA) was introduced as a viable and reliable operative treatment option for this indication. The purpose of this study was to evaluate whether treatment with RTSA can reduce 1 year mortality in elderly patients with complex displaced PHF. Methods: A retrospective cohort study, comparing a cohort of all patients over 75 years who underwent RTSA of proximal humerus fractures between 2012-2015 in one level 1 trauma center, to a cohort of all patients over 75 years who presented to the medical center's emergency room with displaced proximal humerus fracture between 2008-2010 a time when RTSA was not yet available as a treatment option. The primary end point was 1 year mortality. Results: the surgical treatment group included 62 patients, and the conservative treatment group included 83 patients. One year mortality was 5 (8.1%) in the surgical treatment group versus 9 (10.8%) in the conservative treatment group (p=0.56). Conclusions: no significant change in 1 year mortality was found between the groups, although there was a trend in favor of RTSA. Further studies with larger populations are needed to determine whether this trend is of clinical significance.

Abstract no.: 48611 ASEPTIC LOOSENING REVISION OF HIP AND KNEE TOTAL ARTHROPLASTY: INFECTION SHOULD ALWAYS BE RULED OUT Claudia RODRIGUES, Luis COUTINHO, Luis BARROS, Marta SILVA, João ROSA, Ricardo SOUSA Centro Hospitalar do Porto, Porto (PORTUGAL)

An accurate diagnosis of the cause of failure is crucial before revision arthroplasty surgery. Our aim was to determine the adequacy of pre- and intraoperative investigation to exclude infection and its relation with subsequent infection rate after presumed aseptic loosening revision surgery. We retrospectively studied all patients that underwent revision total hip or knee arthroplasty surgery with presumed aseptic loosening diagnosis between January 2013 - April 2015. We report infection rate after surgery as well as preoperative (inflammatory markers and arthrocentesis) and intraoperative (microbiological study) tests performed. 98 cases were included (64 THA;34 TKA). Overall rate of infection was 6.4%(6/98). It was higher in hips 7.8%(5/64) than knees 2.9%(1/34) although not statistically significant. Only 26.5% (26/98) patients had a complete pre- and intraoperative study to exclude infection, and of those none had postoperative infection. Of the remaining 72 cases, 41 collected multiple intraoperative samples for culture. Of those, 12.2%(5/41) met infection criteria of at least two samples with the same microorganism. Of these 5 patients: only one was properly identified and treated with antibiotics, one remained asymptomatic despite the lack of treatment and three had clinical evidence of postoperative infection. In the 31 cases which had no preoperative nor intraoperative exams, the infection rate was 9.7%(3/31). While it is clear that several factors contribute to the increased risk of infection after revision surgery, this study confirms that infection is present in a significant proportion of supposedly aseptic loosening revision and that it should be actively and systematically investigated.

Abstract no.: 46690 HEMATOGENOUS PERIPROSTHETIC JOINT INFECTIONS: AN ANALYSIS OF 70 CONSECUTIVE EPISODES

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The incidence of hematogenous periprosthetic joint infections (hPJI) is probably largely underreported. Knowledge about primary foci and microbiological characteristics of this entity is crucial to establish preventive and improve diagnostic and therapeutic strategies to counteract hPJI.Methods:We retrospectively analysed all patients with hPJI, who were treated at our institution from January 2010 until December 2016. Diagnosis of PJI was established if 1 of the following criteria applied:macroscopic purulence, presence of sinus tract, positive cytology, significant microbial growth in synovial fluid, periprosthetic tissue or sonication culture of retrieved prosthesis components, positive histopathology. PJI was classified as hematogenous if the following criteria were fulfilled additionally: onset of symptoms >1 month after arthroplasty AND i) isolation of the same organism in blood cultures OR ii) evidence of a distant infectious focus consistent with the pathogen. Results: 70 episodes of hPJI were included. Sites of PJI included 39 knees, 29 hips, one shoulder and one elbow joint. The pathogen was identified in 99%, the majority of episodes was monomicrobial (91%). Blood cultures were collected in 39 cases and identified the pathogen in 67%. In 55% the primary focus was identified and included an intravascular (endocarditis/plastitis, thrombophlebitis; n=15), urogenitary (n=8), dental (n= 6). origin gastrointestinal. (n=5) and osteoarticular (n=2) and skin/soft tissue (n=1).Conclusions: Causative agents were identified in the vast majority of hPJI with a predominance of high virulent microorganisms such as staphylococci, streptococci and gram-negative bacilli. A meticulous diagnostic workup including collection of blood cultures and performance of echocardiography is crucially important to cure hPJI and prevent relapse of such infections.

Abstract no.: 47235 TWO-STAGE TREATMENT OF SEPTIC HIP ARTHRITIS IN ADULTS.

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Objectives: The objectives of this study were to assess the medium-term results in a series of adult patients with septic hip arthritis. Methods: This is a prospective, non-randomized cohort study, comprising 7 patients (3 males and 4 females) and 7 hips, referred at our department from 2012 to 2016 for deep hip joint infection. Clinical, laboratory and x-ray signs of persistent chronic hip joint infection were present in all patients: functional impairment of the affected hip. leucocytosis, elevated ESR and CRP and and radiographic signs of joint damage. Radical synovectomy, debridement, excision of all infected tissus, resection of the femoral head onto healthy bone, reaming of the acetabular cavity and apllying of a preformed antibiotic-loaded hip spacer was performed at the first stage. Revision arthroplasty using cementless hip implants was performed at the second stage only after successful eradication of infection. Results: 6 of 7 hips were successfully converted to THA after an average period of 28,5 weeks and no clinical, laboratory and xray signs of infection were observed in the first 12 months after the second surgery. One patient returned to the clinic with an active sinus after 18 weeks and was reoperated. Debridement and change of the hip spacer with a new one was performed. 34 weeks after THA was performed. 7 months later we haven't observed relapse of the infection in this case. Conclusions: Two-stage surgery for septic hip joints arthritis is a reliable method showing reliable results and offers a good option for hip reconstruction.

Abstract no.: 46832 PERIPROSTHETIC FUNGAL INFECTIONS: OUTCOMES AND PREDICTIVE FACTORS

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Introduction: Fungal periprosthetic joint infections (PJI) are rare and require complex multidisciplinary management. Successful single and two-stage revision procedures have been described in its management. In performing the largest single-centre study in the current literature, we will describe our experiences and outcomes of this rare diagnosis. Methods: Patients were identified retrospectively from a prospectively collected institutional infection database. Clinical notes were evaluated for demographics, comorbidities and clinical outcomes. The diagnosis of fungal PJI, and any recurrence following treatment, was made in accordance with the Musculoskeletal Infection Society (MSIS) criteria. Failure was defined as recurrence of infection necessitating excision arthroplasty, or amputation. Results: Between 2005 and 2015, 25 patients were diagnosed with fungal PJIs involving hip (6) and knee (14) arthroplasties, and endoprostheses (5). 88% had polymicrobial infections. Surgical protocol consisted of single stage (5) and two-stage (20) revision. At final follow-up there were 14 failures: one permanent excision arthroplasty, three cases of recurrent PJI, and ten amputations. Conclusions: Revision specialists should maintain a low threshold for consideration of fungal PJI, particularly in the polymicrobial and multiplyrevised cases. The detection of fungal organisms in multiorganism PJI is strongly associated with amputation and patients should be counselled at the outset.

Abstract no.: 46160 IS IT POSSIBLE TO TREAT CHRONIC FUNGAL PERIPROSTHETIC JOINT INFECTION WITH SINGLE-STAGE REVISION? ---- AN AVERAGE OF 5 YEARS OF FOLLOW-UP

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Background: periprosthetic infection caused by fungal pathogens are a rare entity and there exist no definitive guidelines according to which these infections can be successfully managed. In these situations, we wondered whether patients could be treated successfully for their fungal infections with single-stage revision. Methods: a retrospective analysis between January 2004 and October 2014 included 11 patients (4 hips and 7 knees) with chronic fungal periprosthetic joint infections who underwent single-stage revision, including aggressive soft tissue debridement, thorough removal of infected components and cement, pouring powdered vancomycin into the medullary cavity and direct intra-articular injection of fungus-sensitive antibiotics, reasonable combination of antifungal agents and antibacterial medications. Recurrence of infection and clinical outcomes were evaluated. The average follow-up was 5 years (2-10 years). Results: there were 2 failures during the study period at 34 months and 19 months respectively after single-stage revision; one patient died due to acute heart failure on the 8th day post-operation and one patient had a suspicious symptom of re-infection and received adequate anti-biotherapy. Of the 11 patients, 7patients had satisfactory outcomes and required no additional surgical or medical treatment for recurrence of infection. The mean postoperative Harris hip score and Hospital for Special Surgery knee score were 77 points and 78 points, respectively at the most recent assessment. Conclusion: treatment of chronic fungal periprosthetic joint infection with single-stage revision can be fairly effective and achieving acceptable functional outcomes, which indicated that this may be an feasible alternative strategy in selected patients.

Abstract no.: 46478 USE OF ANTIBIOTIC CEMENT-IMPREGNATED INTRAMEDULLARY-NAIL IN TREATMENT OF INFECTED NON-UNION OF LONG BONES USING 2 STAGE PROCEDURE

Arun Kumar PANDEY¹, Saurabh AGRAWAL² ¹ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS), new Delhi (INDIA), ²MLB MEDICAL COLLEGE, JHANSI (UP), JHNSI (INDIA)

Use of Antibiotic Cement-Impregnated Intramedullary-Nail in Treatment of Infected Non-Union of Long Bones using 2 stage procedure Pandey Arun Kumar*, Agrawal S**., Gupta P** *Department of Orthopaedic, AIIMS, New Delhi ,INDIA Introduction: Infected non union of long bone is a chronic and debilitating disorder. Release of antibiotic from the bone cement at high concentration prevent bacterial growth ,biofilm formation .The aim of this study is to summarise our experience with the use of antibiotic cement impregnated intramedullary nail (ACIIN) for control of infection and to achieve union in infected non union of long bones. Materials and Methods: We prospectively studied 29 patients with infected non union of long bones. ACIIN was used as 1st stage in all patients after adequate debridement. In patients, whom union was not achieved in primary procedure, 2nd stage procedure in form of exchange nailing with or without bone grafting was opted. All patients were followed up with an average follow up of 18 months. Results: Infection controlled in 27 patients as primary procedure. Union achieved in 8 patients without any need of secondary procedure. union achieved in 19 patients after exchange nailing with or without bone grafting .Discussion: Local antibiotic therapy results in higher local concentration of antibiotics than those achieved with IV administration. PMMA is most widely used carrier material for antibiotic. In two stage philosophy of treatment of infected non union, the elimination of infection is prime importance. Conclusion: ACIIN are useful for infection control in infected non union of long bones.

Abstract no.: 47730 GROWTH DEFORMITY AFTER LOWER LIMB SUBACUTE OSTEOMYELITIS (BRODIE'S ABSCESS)

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Abstract: We present a series of four children with Brodie's abscesses (subacute osteomyelitis) and demonstrate that deformities can develop up to 3 years after initial presentation. Patients and methods: Four children presented to our unit between 2008 and 2016. Two patients had a Brodie's abscess in the distal femur and two in the proximal tibia. Three out of four patients had surgery and all patients received IV antibiotics. All patients were followed up after discharge and the average time to deformity developing was 25.5 months. No organisms were isolated from any of the patients. Recommendations: We recommend children with a history of juxtaphyseal lower limb Brodie's abscess should be followed up on an annual basis for the first 4 years following initial presentation with long leg standing radiographs.

Abstract no.: 47140 IS THE NON-UNION SCORING SYSTEM CLASSIFICATION (NUSS) STILL VALID TO DESCRIBE THE CASE OF SEPTIC FAILURES? Giorgio Maria CALORI, Emilio Luigi MAZZA, Massimiliano COLOMBO, Alessandra COLOMBO, Simone MAZZOLA, Fabio GIARDINA, Fabio ROMANÒ ASST PINI CTO, Milano (ITALY)

Introduction: A new scoring system, NUSS (Non Union Scoring System) is available in order to assist surgeons in the choice of the correct treatment in non-union surgery. This classification pays particular attention to the septic condition of the patient with an evaluation of specific blood test, the current or previous infection and the condition of the soft tissue. Objectives: The aim of this study is to determine the evidence supporting the use of the NUSS classification and to validate the treatment algorithm suggested by this scoring system. Methods: 100 patients with septic non-union of the long bones were included in our clinical study: 30 septic tibia non-unions, 30 septic femur non-unions, 20 humerus septic non-unions and 20 septic forearm non-unions. Different treatment options are possible for osteomyelitis at any stage. Results: The mean follow-up was 27.5 months. 80/100 (80%) patients achieved bony union and were satisfied with the functional and cosmetic outcome. 93/100 (93%) infections had been controlled. The complication rate is remarkable so that soft tissue defects should be assessed by using flaps to close the wounds in early stages. Conclusions: A statistical analysis of the first results we have obtained with the use of NUSS in order to apply an algorithm of surgical treatment in septic non-union showed significant rates of union in all the evaluated patients; this consideration show us that NUSS could be an appropriate scoring system in order to classify and stratify non-unions and to choice the correct treatment.

Abstract no.: 47148 THE ROLE OF PET TC FDG IN THE 2 STEPS IMPLANTATION OF MEGAPROSTHESES IN POST-TRAUMATIC AND PERIPROSTHETIC SEPTIC BONE DEFECTS

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Introduction: The development of megaprosthesis is offering important opportunities for Orthopaedic and Traumatologist surgeons for the replacement of skeletal segments, also in post traumatic and periprosthetic bone defects especially in septic conditions. Surely an evaluation of the septic activity and the residual vitality of the bone affected are essential informations in order to decide if it's necessary a surgical treatment in 1 or 2 steps and to evaluate at which level perform the bone resection. FDG PET CT could be an important tool to better analize this kind of pathologies. Materials and Methods: The purpose of this study is to analyze the validity of FDG PET CT to choose the better and safer treatment for post-traumatic and periprosthetic septic bone loss, also in suspected sepsis conditions. For this purpose FDG PET CT is able to confirm the presence of a septic state and to assess the residual bone vitality. Results: in all cases treated following this method it was obtained a remission of the septic condition after the first step and it was possible to perform the second operation of megaprosthesis implantation without any recurrence of infection at 12 months of follow-up. Conclusion: FDG PET CT seems to be a great tool available for the Orthopaedic surgeon to treat severe septic post-traumatic and periprosthetic bone loss and to confirm the presence of infection and assess bone vitality to better decontaminate the surgical site and thus reducing the rate of recurrence of infection after the second prosthetic implantation step.

Abstract no.: 48376 THE PHENOTYPIC DETECTION OF CARBAPENEM RESISTANT ORGANISMS IN ORTHOPAEDIC WOUND INFECTIONS IN ILE- IFE.

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This study investigated the phenotypic detection of carbapenem resistant organisms in orthopaedic wound infections in Ile-Ife. A cross sectional study of 180 samples from wounds of 153 orthopaedic patients seen at the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) between January to June 2015 was performed. Bacterial isolates were identified using MICROBACT identification kits and antibiotic susceptibility was evaluated by the Kirby-Bauer method. Screening and phenotypic confirmation of carbapenemase and metallo-beta lactamase (MBL) production were done by Modified Hodges Test and Disk potentiation method as prescribed by the Clinical and Laboratory Standards Institute. Of the 180 specimens processed, 123 (68.33%) yielded growth of 162 isolates, 92 (56.79%) were Gram negative bacilli (GNB). Staphylococcus aureus was the predominant species of organism isolated accounting for 30.86% (n=50) of the total isolated organisms followed by Pseudomonas aeruginosa which accounted for 22.84% (n=37) of the isolates. Imipemem resistance for GNB was 7.61%, and for GPC was 4.92%, while meropenem resistance for GNB was 14.13% and 16.39% for GPC isolates. Carbapenemase production was observed in 8.71% of GNB isolates with highest prevalence in Pseudomonas aeruginosa isolates while MBL production was observed in 5.44% of total GNB isolates. Our results showed Pseudomonas aeruginosa as the predominant GNB found in OWI while Staphyloccocus species is the predominant GPC in this environment. Carbapenem resistance was observed both in GPC and GNB. Carbapenemase production (and MBLs) was detected to be highest in Pseudomonas aeruginosa.

Abstract no.: 48197 MULTI DRUG RESISTANT SPINAL TUBERCULOSIS: A SERIES OF 27 CASES

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Introduction: The Bacteriological diagnosis of Multi Drug Resistant (MDR) tuberculosis is tedious because of its being paucibacillary. We present a series of presumptive MDR spinal tuberculosis patients which were bacteriologically proven and appropriately treated while others were labelled as clinical drug resistance and treated for resistance to isoniazid and rifampicin. They were evaluated by contrast MRI (CMRI) and PET scan. Methods: All patients of spinal tuberculosis treated by category I Anti Tubercular Therapy (ATT) when failed to show healing response/developed new lesion while on ATT were enrolled. The lesions were debrided and the tissue was sent for histopathology, PCR, Liquid culture/CBNATT/Line Probe Assay. All the patients after histopathological confirmation (bacteriologically proven drug resistance and clinical drug resistance) were put on second line ATT. These patients were then evaluated for response at 12,18,24,36 months with sequential radiological/CMRI/PET scan and hematological investigations. Results: 27 cases of MDR spinal tuberculosis (10 males and 17 females) were included. All (n=27) demonstrated histopathological features of tuberculosis. Drug resistance was proven by culture (10) or molecular methods (5) in 15 patients only. All the MDR proven cases (n=15) and clinical drug resistance cases (n=12) have shown healing of the lesion on CMRI and PET scan after ATT ranging from 12-36 months. Conclusion: Bacteriological drug resistance was demonstrated in only 15/27 cases and the remaining were treated successfully as clinical drug resistance. The clinical drug resistance is an entity to be recognized in treatment failure in spinal tuberculosis patients, who do not show drug resistance bacteriologically.

Abstract no.: 47807 TUBERCULOSIS AFTER IMPLANT SURGERY ANEW CHALLENGE

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Tuberculosis common in Asian countries, traditionally sees this as spinal, hip joint etc. In last decade implant frequently used and complications are non-union, infection, implant failure, peri prosthetic fracture, metallosis, carcinogenic effect, difficulty in doing mri, cost, irritation soft tissue as tendons, and difficulty in removing specially LCP, damage to near joint. New complication as implantation tuberculosis coming .Main problem lies in detecting early which leads to success without removing the implant. Difficulties arise because of mixed infection even in close fracture when surgery done becomes open. It gives picture of pyogenic and histology and c/s may not help. Suspicion of clinician seeing other factors will help like erosions, cavitations, osteoporosis. Proper h/p seen in 25% rest treated on suspicion .This study of 25 cases had persistent pain after surgery, discharging sinuses, implant loosening. Ten after long bone fracture, 6 ankle fracture, two after TKR ,rest after fractures hip, shoulder etc. H/P positive in seven and in none bacilli grown but xray picture helped. In 3 therapeutic trial as patient not responding to other treatment and no sign suggestive of tuberculosis. Two diagnosed after meningitis. Be suspicious from beginning if patient c/o pain, x ray changes, erosion, cavitations etc. One should suspect this as tuberculosis especially in diabetics, ankle region, endemic areas and in two diabetes diagnosed after infection did not respond. Serological tests did not help. Atypical bacilli may be responsible. Extensive investigation in tertiary centre may confirm gene ,other advance investigations

Abstract no.: 46782 USING BBFISH TECHNOLOGY ON THE SONICATION FLUID FOR THE DIAGNOSTIC OF PROSTHETIC JOINT INFECTIONS.

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Introduction: In the context of an increase number of primary and revision total hip and total knee arthroplasty performed yearly, an increased risk of complication is expected. In Sibiu, Romania, according to the Romanian Arthroplasty Register in 2016, 127 primary and 10 revision surgeries of THA, and 53 primary and 8 revision surgeries of TKA were performed. Prosthetic joint infection still remains the most common and feared arthroplasty complication. A correct diagnosis of infection is decisive for a correct treatment. In this setting, a new strategy of diagnosis of PJIs was implemented in the Academic Emergency Hospital Sibiu, with the beginning of September 2016, strategy that uses sonication and bbFISH technology. Methods: Until February 2017, 16 patients (16 retrieved implants) were enrolled in the study after written informed consent was obtained. Sonication fluid (SF) was collected after sonication of the implants, and samples were harvested on aerobic and anaerobic culture media. A bbFISH kit (hemoFISH® Masterpanel, miacom diagnostics GmbH Düsseldorf, Germany), was used as a rapid method of bacteria detection. Results: 7 patients were diagnosed with PJIs (all 7 patients presented a positive culture of the SF). Comparing FISH with culture, all 7 samples tested true-positive, with the exception of Pseudomonas fluorescens that was associated with Staphylococcus epidermidis in one case, the kit did not contain a probe for Pseudomonas fluorescens. Conclusion: Bacteria culture of SF remains the gold standard. bbFISH holds promise to be a diagnostic tool for rapid identifying of PJIs.

Abstract no.: 47507

ANALYSIS OF ANTIBIOFILM **COST-BENEFIT MICROBIOLOGICAL TECHNIQUES FOR PERI-PROSTHETIC JOINT INFECTION DIAGNOSIS.** Maria Teresa TRENTINAGLIA¹, Carlo ROMANO², Elena DE VECCHI³, Nicola LOGOLUSO⁴, David GEORGE⁵, Ilaria MORELLI⁶, Lorenzo DRAGO⁷ ¹Bocconi University, Milan (ITALY), ²Centre for Reconstructive Surgery and Osteoarticular Infections: Centre for Reconstructive Surgerv and Osteoarticular Infections; Orthopaedic Research Institute R.Galeazzi, Milano, Italy, Milan (ITALY), ³3. Laboratory of Clinical Chemistry and Microbiology, IRCCS Galeazzi Institute, Milan Italy, Milan (ITALY), ⁴1. Centre for Reconstructive Surgerv and Osteoarticular Infections, IRCCS Galeazzi, Milan, Italy, Milan (ITALY), ⁵Department of Trauma and Orthopaedics, University College London Hospitals, London, UK, London (UNITED KINGDOM), ⁶University of Milan - IRCCS Istituto Ortopedico Galeazzi; Pediatric Orthopaedic unit, Milan (ITALY), ⁷Laboratory of Clinical-Chemistry and Microbiology; IRCCS Galeazzi Institute and SCIBIS Department, University of Milan, Milan, Italy, Milan (ITALY)

Background: Intra-operative pathogen identification represents the diagnostic benchmark in detecting biofilm related infections, although it can be only partially effective whenever bacterial biofilms are present. More recent biofilm debonding techniques may improve microbiological diagnostic accuracy, though little is known about their economic impact. This health economics study examines the direct and indirect costs connected with the routine introduction of antibiofilm microbiological techniques on hip and knee PJIs. Results: This study considers five samples per patient, each processed separately with traditional tissue culture with or without sonication of prosthetic components, or pooled together using the MicroDTTect device (a close system for collection, transport and treatment with dithiothreitol for microbial release from biofilm). On average, unitary direct costs were € 397 and € 393 for sonication or MicroDTTect, respectively, compared to € 308 for traditional techniques. MicroDTTect also allows for significant abatement in operational time. Pooling together direct and indirect costs related to false positive and negative, with unnecessary medical treatments and possible medical claims, MicroDTTect or sonication become increasingly cost-effective when the extra-costs, generated by diagnostic inaccuracy of traditional tissue culture, took place, respectively, in 2% or 20% or more of the patients. Conclusions: This is the first study on the economic impact of the routine clinical use of antibiofilm microbiological techniques in orthopedics. Despite the possible impact of country characteristics in calculating costs, this analysis highlights the potential economic advantage to hospitals associated with the routine introduction of antibiofilm techniques for microbiological diagnosis of PJI.

Abstract no.: 47518 ANTIBACTERIAL COATING DAC FOR THE ONE STAGE TREATMENT OF PERI-PROSTHETIC JOINT INFECIONS: RESULTS OF A COMPARATIVE CASE-CONTROL STUDY.

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Introduction: The golden standard for treating prosthetic joint infections (PJIs) is two-stage revision, despite the higher costs, morbidity and mortality. Recent studies showed that a new fast-resorbable, antibacterial-loaded hydrogel coating can reduce surgical site infections after joint replacement, by preventing implant bacterial colonization. Methods: In this prospective study, 22 selected patients underwent a one-stage revision with cementless implants, coated intra-operatively with a fast-resorbable, antibiotic-loaded hyaluronan and poly-D,L-lactide based hydrogel coating ("Defensive Antibacterial Coating", DAC, Novagenit, Italy) directly spread onto the implant before insertion. DAC was loaded intra-operatively, according to coltural examination, with vancomycin (14 patients) or vancomycin and meropenem (8 cases). This cohort was compared with a retrospective series of 22 consecutive patients, matched for age, sex, host type, site of surgery, undergoing a two stage procedure. Primary endpoint was the infection recurrence at follow-ups, as defined by Philadelphia consensus criteria. Results: In each group, 18 patients were subjected to a knee prosthesis revision and 4 to a hip prosthesis revision. At a mean follow-up of 20.2 ± 6.3 months, 2 patients (9.1%) in the DAC group showed an infection recurrence, compared to 3 patients (13.6%) in the two-stage group. No adverse events associated with the use of DAC or radiographic loosening of the stem were observed at the latest follow-up. Discussion: This is the first report on one-stage cementless revision surgery for PJI performed with a fast-resorbable antibacterial hydrogel coating. Our data, though at a relatively short follow-up, show similar infection recurrence rate if compared to two-stage revision.

Abstract no.: 46930 DO TRICLOSAN COATED SUTURES REDUCE SURGICAL SITE INFECTIONS? A META-ANALYSIS OF THE LITERATURE

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Surgical site infection (SSI) account for 5% of all surgical complications and have a significant impact on patient care and add a substantial cost to health care providers. Since gaining FDA approval Triclosan coated sutures (TCS) have been used to reduce the risk of SSIs. We aim to perform a meta-analysis to assess if Triclosan coated sutures reduce the risk of SSIs. A systematic search of MEDLINE, EMBASE and Central was carried out by independent reviewers to identify randomised control trials comparing TCS vs standard sutures. The primary outcome measure of interest was surgical site infection at 30 days. A Meta-analysis was performed using REVMAN 5.3. Seventeen RCTs involving 8460 participants were included. TCS significantly reduced the risk of superficial SSIs by 22% (risk ratio 0.78 (0.68 - 0.90)) (P<0.05). For deep infections triclosan coated sutures did not significantly reduce the risk of deep SSIs (RR 0.76 (95%Cl 0.4-1.2). No heterogeneity of statistical significance was demonstrated throughout the included studies. This review demonstrated the significant advantage of the use of Triclosan coated sutures in order to reduce the prevalence of surgical site infections. However, when assessing cost effectiveness in order to prevent one superficial SSI we would need to spend £11,000. Therefore although clinically effective question marks arise as to whether they are cost effective.

Abstract no.: 47126 TREATMENT TACTICS AND RESULTS IN PJI FOLLOWING TOTAL KNEE ARTHROPLASTY

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Introduction: In Belarus, there are about 1200 primary and about 50 revision TKA per year. We see the increasing rate of revisions, and one of the reasons is PJI. Purpose: To determine the optimal treatment tactics and evaluate results depending on the timing of infection. Materials: 84 patients with deep PJI after TKA treated for the last five years. Unlinked condylar prostheses were used for primary surgery. Cultures revealed S.aureus in 30%, gram-negative bacteria in 20% S.epidermidis in 10%, Ent.faecalis in 10%. 26 patients had early-onset PJI (Group 1), treatment included debridement and immobilization. Group 2, late PJI (mean time 12.6±6.7 weeks), included 58 patients and was divided according to treatment tactics: 2A- debridement, lavage, prosthesis preservation (13 patients); 2B- prosthesis removal, cast (19); 2C- prosthesis removal, external fixation (19); 2D- prosthesis removal, AB-cement spacer followed by internal fixation or revision TKA (12). Results: 1 - 21 (80.8%) patients achieved eradication of infection. In 5 cases, prosthesis removal was required. 2A- infection was eradicated only in 30.8%, and 69.2% required implant removal. 2B- eradication in 15 (78.9%) cases; however, arthrodesis in none of patients. 2C- eradication in 12 (85.7%), arthrodesis - in 6 (42.6%) cases. 2D- in 10-12 weeks spacer was removed and 6 patients had revision TKA (infection recurrence in 4 patients) and 6 had arthrodesis (bone union and eradication of infection in 100%). Conclusion: In early PJI, debridement effectively controls infection in the majority of cases. In late PJI, two-stage knee arthrodesis shows the highest success rate.

Abstract no.: 46290 LAMINAR FLOW IS NOT REQUIRED IN THEATRES DURING JOINT ARTHROPLASTY TO REDUCE THE RISK OF INFECTION

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Background: Deep infection post arthroplasty remains a devastating complication with significant morbidity for the patient and large costs. Cost-effectiveness analysis in recent studies indicate that laminar flow is unnecessary. It is generally accepted that laminar flow reduces the concentration of bacteria in theatre air, but what remains unclear is whether or not this translates into a reduction in post-operative infection. Objectives: Despite conflicting evidence, in the United Kingdom laminar flow is still recommended. Our hypothesis was that deep infection rates would be similar, if not lower than standard rates quoted in the literature. Methods: We present a retrospective single surgeon case series of 74 knee and 69 hip total joint arthroplasties performed without laminar flow, in which 30 and 90 day deep infection and revision rates were primary outcome measures. For each case a single preoperative dose of gentamicin 5mg/kg and teicoplanin 10mg/kg was given. The surgical site was prepared with alcohol solution, tranexamic acid 1g was given intravenously at induction, and a calf pump was used on the contralateral leg. Results: A total of 74 knee replacements and 69 hip replacements were included. The 30 and 90 day post-operative deep infection rates were both 0%. The majority of patients had mild systemic disease with 121 patients ASA grade 2. Conclusions: Our study provides evidence that excellent post-operative infection rates can be achieved in the absence of laminar flow. Our study emphasises the importance of meticulous technique, prophylactic antibiotics, rigid skin preparation and draping protocols, and minimising theatre traffic.

Abstract no.: 48773 REDUCING SURGICAL SITE INFECTIONS THROUGH IMPROVED THEATRE ETIQUETTE

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Introduction: The British Orthopaedic Association (BOA) have published guidance to help reduce surgical site infection (SSI) in arthroplasty procedures (Consultant advisory book, 2014). We audited compliance against these standards and investigated other ways to improve theatre activity. Methods: 15 consecutive arthroplasty procedures in July 2014 and 20 consecutive arthroplasty procedures in May 2016 were audited. Results were presented at the department's clinical governance meeting to educate clinicians on best practice. Areas of non-compliance and potential sources of SSI were highlighted and ideas for improvement generated. Results: Theatre etiquette was generally well adhered to but an area for future improvement was the use of masks by all theatre staff. Hair covering improved from 87% to 100% between study periods. We identified that certain equipment was inappropriately placed within a theatre, leading to avoidable opening of theatre doors intra-operatively. Conclusion: Theatre etiquette will be emphasised to theatre staff during safety briefings and equipment relocated to improve theatre flow. This will ultimately help to reduce the incidence of SSI.

Abstract no.: 47334 INTRAOPERATIVE FEATURES DURING STAGES OF TREATMENT IN PATIENTS WITH PERIPROSTHETIC JOINT INFECTION AFTER TOTAL KNEE ARTHROPLASTY.

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Introduction. Treatment of chronic periprosthetic joint infection (PJI) is connected with high reinfection rate and financial costs. Two stage reimplantation with the use of dynamic and static spacers on the first stage is an effective treatment algorithm of such complication, but intraoperative features during spacer implantation and revision TKA with the use two spacer types of differ. Goal was to evaluate the influence of a spacer type on intraoperative features during stages of treatment in patients with PJI. Methods. From year 2007 to 2015 161 patients with PJI were treated. The mean follow up period was 65 months. The mean age was 62 years. The outcomes included analysis of effectiveness intraoperative features (operation blood loss. and time. type of implant). Results Effectiveness of the first stage was 70,1%. The second stage demonstrated 90,1% effectiveness. There was statistically lower reinfection rate after the first stage in patients treated with dynamic spacer 88,1%, compared with 59,1% in patients with static spacers. Revision knee arthroplasty after static spacer was followed by frequent (p<0,05) use of extended surgical approach, constrained implants (p<0,05) and long operation time (p<0,02) compared with dynamic constructions.Conclusion.Two stage reimplantation with the use of dynamic spacers provides better infection control, knee function between stages, less traumatic debridement and revision knee arthroplasty. Inability to comply recommended interval between stages, due to specifics of financing, makes the implantation of dynamic spacers in patients with PJI on the first stage more preferable.

Abstract no.: 47133 SEPTIC NON-UNIONS AND BONE DEFECT: NEW TRENDS IN RECONSTRUCTION IMPROVING BIOTECHNOLOGIES

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Introduction: Septic non-union and bone loss are a challenging clinical entity. Surgical management is almost always needed and can require several interventions to obtain healing. These patients need a classification in order to be addressed to the right surgical treatment; in our experience we apply the NUSS classification. Objectives: Aim of the study is to make a review of the literature about the existing strategies in the treatment of septic non unions and bone defects. Methods: We evaluated the scientific literature concerning the treatment of septic non-unions. We performed a literature review using the universally validated search engines in the biomedical field. Results: Different treatments are proposed by authors of the analysed clinical studies: conservative treatment, radical debridement, bone fenestration, reaming, bone troughing, the Masquelet-technique, bone transport, bone grafting, megaprosthesis implantation and amputation. All the patient enrolled in the analysed studies were not classified by comprehensive classification that evaluate the bone disease and also the patient condition. Conclusions: The most relevant studies apply the Masquelet technique or Chamber Induction Technique. The first surgical time is finalized to obtain a clean viable soft tissue bed, placement of a PMMA antibiotic impregnated spacer to induce a neovascular and bioactive membrane. In the second surgical time we decide to treat the patient applying biotechnologies utilising monotherapy or polytherapy in relation to the NUSS score. The Induction Chamber Technique could improve the efficacy and safety of biotechnologies implantation creating the perfect environment in which bone regeneration could occur.

Abstract no.: 48362 IN-VIVO PHARMACOKINETIC EVALUATION OF ANTIBIOTIC ELUTION FROM A LOCALLY IMPLANTED BONE GRAFT SUBSTITUTE IN A COHORT OF PATIENTS WITH INFECTED MEGA PROSTHESES Thomas COLDING-RASMUSSEN, Peter HORSTMANN, Werner HETTWER, Michael Mørk PETERSEN Rigshospitalet, University of Copenhagen, Copenhagen (DENMARK)

Introduction: Locally implanted antibiotic-eluting bone-graft substitutes may be a valuable addition to the current treatment of infected mega-prostheses. We wished to assess and report in-vivo antibiotic elution characteristics of Gentamicin- and Vancomycin-loaded bioceramic composites. Materials and methods: We prospectively followed 32 patients (Male/Female=19/13, mean age=56 (21-82) years) who underwent local implantation of Gentamicin (n=11), Vancomycin (n=15) or a combination of both (n=6) with CERAMENT™|G or CERAMENT™|V (mean amount 11 (5-20) mL). We measured antibiotic plasma-concentrations (1h, 3h, 24h, 48h and 72h post-implantation) and antibiotic urine-concentrations (24h, 48h and 72h post-implantation) in all patients, using particle-enhanced turbid-metric inhibition immunoassay (PETINA). In patients with a surgical drain (n=15), antibiotic drain-fluid concentration was measured at time of drain removal. Results: High local concentration of Gentamicin (57.8 mg/L (95%-CI: 45.8-69.7)) and Vancomycin (234.3 mg/L (95%-CI: 198.9-269.7)) was observed in drain fluid. Consistently low plasma-concentrations were observed during the initial 72h for both antibiotics: mean 0.35 mg/L (95%-CI: 0.25-0.44) for Gentamicin and mean 1.34 mg/L (95%-CI: 1.02-1.66) for Vancomycin. After 3 days, 52.5% (95%-CI: 25.2-79.8%) of the implanted Vancomycin and 28.9% (95%-CI: 19.0-38.8%) of Gentamicin was excreted in urine. Use of a deep drain caused a significant reduction in Vancomycin urine excretion (55.6% to 28.7%, p=0.042) and a similar tendency occurred for Gentamicin (34.1% to p=0.078). Conclusion: Local implantation of CERAMENT™IG 16.2%. and CERAMENT™|V results in safe, early post-operative in-vivo plasma concentrations and high local drain fluid concentrations. Use of a deep wound-drain results in a significant reduction in antibiotic urine excretion.

Abstract no.: 47130 INFECTED NON-UNION AND CRITICAL BONE DEFECTS OF THE FOREARM

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Introduction: Infected forearm non-union is rare in clinical practice, but the problem is usually very complex. The objective of this study was to evaluate the effectiveness of the treatment of infected forearm non-union by the Masquelet technique (Chamber Induction Technique – CIT) in two surgical time. We measured the mean clinical and radiological healing rate and healing time. Methods: We retrospectively reviewed 30 treated by CIT. The site of bone defects involved 16 radius and 12 ulna and 2 both radius and ulna. The surgical technique was characterized in the first surgical time by a radical debridement of the non-union and the positioning of a bi-antibiotic cement spacer, usually the interval before the removal of the device was 3.88 months (range 2 – 6 months). In the second surgical time the objective is the reconstruction, our surgical strategy depends on the Non Union Scoring System (NUSS). The high value of the score oblige us to adopt in all the patients a polytherapy according to the severity of the bone condition. In 9/30 (30%)patients we used an autologous bone graft derived from iliac crest, and in 21/30 (70%) was collected autologous bone graft derived by Reaming Irrigator Aspirator technique. Results: The mean follow-up after the second surgical time was 12 months (range 6-45 months). 27/30 (90%) patients had bone union and in 2/30 (6,7%) patients we observed a recurrence of infection. Conclusions: Our study suggested that the CIT in the treatment of infected forearm non-union acquired satisfied functional results.

Abstract no.: 47974 RELEVANCE OF IMPLANT SURVIVAL ESTIMATES IN STUDIES WITH LONG FOLLOW-UP

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Introduction: Implant survival is commonly calculated using the Kaplan-Meier (KM) method, originally intended for estimating patient survival (mortality), though its widespread led orthopedic surgeons and researchers to use it for estimating implant survival (revisions). Following the publication of long-term joint arthroplasty studies, researchers noted that KM estimates are considerably influenced by "competing risks" (patient deaths or losses to follow-up), which may precede the event of interest (implant revision). Methods: In a recent study, the authors reported 30-year survival of 347 uncemented hip stems, and noted a substantial decrease in KM survival compared to their 25-year estimates for the same series, despite revision of only one stem during that interval. The authors followed recent recommendations for calculating implant survival at long follow-up and used the Cumulative Incidence Function (CIF) that is not influenced by competing risks. Results: Comparing KM and CIF estimates, the former exaggerated revision rates by 59% when the endpoint was revision of the femoral stem (6.3% versus 3.7%) and by 65% when the endpoint was cup revision (32.2% versus 20.8%). The main reason for these discrepancies were the large proportion of patients who died (225 hips, 65%) or were lost to follow-up (24 hips, 7%). Conclusion: Two or more generations of orthopedic surgeons have been accustomed to KM survival curves. The purpose of this presentation is therefore to explain the potential limitation and mis-information of the KM method and to introduce the more suitable CIF method for estimating implant survival, at long follow-up and in an elderly population.

Abstract no.: 48485 EARLY OUTCOMES WITH A NOVEL CERAMICISED ZIRCONIUM BEARING FOR TOTAL HIP REPLACEMENT

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Introduction: Oxidized zirconium-on-highly cross-linked polyethylene (OxZr) has been used as a bearing couple in total hip replacement for over a decade. Recently, a diffusion hardened oxidized zirconium (DHOxZr)-on-DHOxZr bearing was introduced to reduce the risk of component fracture sometimes seen with ceramic-on-ceramic bearings, while gaining the potential long-term wear reduction. The purpose of this study was to evaluate the early outcomes for this novel bearing couple. Methods: Twenty-six (26) subjects were prospectively enrolled at two centers, with 20 subjects implanted with a DHOxZr bearing and 6 subjects with an OxZr bearing. Outcomes included whole blood ion measurements, Harris Hip Scores (HHS), and adverse events. Subjects were followed pre-operatively and at 3, 6, 12, and 24 months. Results: At 24-months, mean whole blood cobalt, chromium, titanium, and nickel levels were 0.25+0.30ug/L, 0.69+0.56ug/L, 1.52+0.65ug/L, and 0.89+0.54ug/L, respectively, in the DHOxZr group. The increase in nickel was of interest, as DHOxZr has undetectable levels of nickel. The increase was related to an outlier subject with levels of 2.3 ug/L. Mean levels in the OxZr group were 0.21+0.11ug/L, 0.61+25ug/L, 1.72+0.27ug/L, and 0.58+0.12ug/L, respectively. Mean HHS scores were in the excellent range for both groups. No subjects were revised and one from each group died from non-device related causes during follow-up. Discussion: The results of this study suggest that the DHOxZr bearing couple is a viable alternative to traditional bearing couples, with similar functional and safety outcomes expected at 24-months. Longer term follow-up is needed to determine if these trends continue.

Abstract no.: 48231 PROSPECTIVE MULTICENTER STUDY OF 553 DUAL MOBILITY CUPS IN A REGISTRY OF 2090

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Introduction: The dual mobility (DM) cup is one the tools used to prevent dislocation. To evaluate its effectiveness, a prospective continuous exhaustive multicenter study was initiated in 2012 in which a latest-generation DM cup model was used in primary THA cases. Materials and methods: Since 1 January 2012, seven clinical investigators have been collecting pre- and post-operative data on a cementless DM cup. A shared computerized database approved by the French Regulatory is used to follow the patients and analyze the data in real time. As of December 31, 2016, 2090 cases were compiled, within which a prospective continuous study of 553 cups implanted without a fracture in 535 patients for coxarthrosis or osteonecrosis with a minimum follow-up of two years. Results: At a minimum follow-up of 3 years in the prospective series, there were no dislocations. Two cups were revised for reasons unrelated to stability. The mean Oxford score was 14.9. All the cups reviewed had satisfactory bone fixation. In the complete series, (3 to 60 months of follow-up), 4 dislocations occurred; 2 in the "degenerative" series (0.15%) and 2 in the "fractures" one (1.43%). Discussion: The main THA follow-up records show revision for dislocation to occur mainly in the first years after the procedure with 35% of revisions performed during the first year post-THA because of instability (Swedish registry). The result of our registry confirms the efficacy of a last-generation DM cup in stabilizing THAs, regardless of the approach and shows no specific complications of the DM implant. Conclusion Our data confirm the benefit of a last-generation DM cup in preventing the risk of early dislocation and the possibility of using it as a first-line treatment in all patients.

Abstract no.: 48334 WHAT ARE THE DESIGN AND SURFACE DIFFERENCES OF COMMON 12/14-TAPERS IN TOTAL HIP ARTHROPLASTY?

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Introduction: Taper corrosion has been identified to be major problem in total hip replacement during the past years. Patients may suffer from adverse local tissue reactions (ALTR) due to corrosion products that are released from modular taper connection. Beside the effect of taper corrosion many surgeons are not aware that the tapers may vary among different manufacturers. Therefore we aimed to assess and compare geometric and topographic design parameters of currently available hip stem tapers from different manufacturers. Material: For comparison well established cementless hip stems made of titanium alloy were choosen. All of them have a 12/14-taper. As geometrical parameters the taper angle, the opening taper diameter and the taper length were measured using a coordinate measuring machine). Several topographical parameters were determined using a tactil roughness measurement instrument. Results. Regarding the geometry, high variations in taper length were seen whereas the taper angle and opening taper diameter vary only to a small extent. Clearly, the tapers differed in topography. The surface roughness parameters vary to a large extent from smooth to very rough values. Conclusion: As expected, this study showed that the stem tapers differ among the manufactures. However, in combination all geometric and topographic parameters will influence the crevice of the taper junction. Considering that taper corrosion is mostly initiated within the crevice, further studies may help to understand the influence of taper variations to the corrosion mechanism.

Abstract no.: 47969 PRE AND POST TOTAL HIP ARTHROPLASTY MEASUREMENT TECHNIQUES OF LEG LENGTH: A SYSTEMATIC REVIEW

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Background: The aim of the study was to systematically evaluate leg length discrepancy techniques pre and post total hip arthroplasty. Methods: A computerised search was performed for relevant studies published from 1946 onwards using major databases. several search engines and cross-referencing. A total of 13 studies were selected. The studies that were included in this review were assessed using the Newcastle-Ottawa Scale. The main indicators of reliability of the measurement techniques were assessed using interobserver and intraobserver agreement measured through the intraclass correlation coefficients and kappa coefficients. Results: Clinical methods of measurement (tape measure and blocks) of leg length are inexpensive, guick and easy to perform with good reliability. The acquisition of leg length measurement from some radiographic methods also required special scanners and equipment that were not practical and costefficient. The CT and MRI scanograms had the highest reliability and accuracy of measurement of leg length although the MRI scanogram was less-extensively studied based on the availability of literature. CT scanograms are obtained from a scout view that was relatively inexpensive, had a short study acquisition time and factor in contractures and limb rotation. Conclusions: Our study shows that the CT scanogram provides excellent reliability and reproducibility for assessing LLD pre and post total hip arthroplasty. Clinical methods, in addition to physical examination and gait analysis, should also be adopted. In patients deemed to have no LLD preoperatively, a plain AP pelvic radiography may be sufficient to compare postoperatively LLD changes.

Abstract no.: 46795 INTRA AND POSTOPERATIVE FRACTURES AND FEMORAL SHORTENED STEM ABOUT A PROSPECTIVE SERIES OF 735 CASES Jean Marc PUCH¹, Loys DESCAMPS¹, Guy DERHI² ¹Clinique St George, NICE (FRANCE), ²Clinique ST Jean, Cagnes sur mer (FRANCE)

Introduction : Today short stems are more and more used on total hip arthroplasty. Among these various short stems, there exists a class called « shortened stem ». Our objectives were to show that our shortened stem does not involve more intra and post operative fractures than the original standard stem. Methods :It's a prospective and continue series including 735 implants for 700 patients. 3 seniors surgeons and 2 centers, We studied all intra and post operative fractures and compared the results with our standard stem(1299 cases) and with the literature. Results :We found 7 femoral fractures including 5 intra operatives and 2 post operatives at 1 month post op. The rate of per op fractures is 0.95%. Ryan et al. about standard stems cementless show 2.1% for 50528 cases and the study of the literature of all type of short stems show 1,5% of intra and post operative fractures for 2782 cases and specially for the shortened stem a rate of 1,1% for 1273 cases. Discussion : Our results are equivalent than shortened stems found on the literature and lower than the results of the conventional cementless stems. The analysis of the various fractures highlighted 2 reasons: a ancillary problem and an oversizing of the implant. Conclusions :The use of a new femoral implant for a surgeon isn't really easy even if it is his usual stem but shortened. The learning curve is however reduced and the respect of the bone are in spite of very interesting

Abstract no.: 47614 DIFFERENCE IN TOTAL HIP ARTHROPLASTY FUNCTIONAL OUTCOMES BETWEEN PATIENTS WITH PRIOR SINGLE LEVEL SPINAL FUSION AND PATIENTS WITH PRIOR MULTI-LEVEL SPINAL FUSION Jing Loong Moses LOH, Lei JIANG, Hwei-Chi CHONG, Seng Jin YEO, Ngai Nung LO Singapore General Hospital, Singapore (SINGAPORE)

Background Recent papers have shown that patients with earlier spinal fusion demonstrate poorer functional outcomes after Total Hip Arthroplasty (THA). However, no papers thus far have compared the difference in THA outcomes between patients with prior single level spinal fusion and patients with prior multi-level spinal fusion. Methods: A review of 82 consecutive patients who had prior spinal fusion surgery who underwent elective THA from 1st January 2006 to 31st December 2015 was conducted. Patients were split into two groups - patients with single level fusion and patients with multi-level fusion. Data on functional outcomes such as the Oxford hip score, total SF-36 score and total Western Ontario and McMaster Universities Arthritis Index (WOMAC) score was prospectively collected at 6 months and 2 years follow up for comparison. Results: 44 patients had single level fusion while 38 patients had multilevel fusion. Patients with single level fusion exhibited better functional outcomes after THA than patients with multilevel fusion [6 months WOMAC (249.00 to 226.31 p = 0.205), 6 months SF-36 total (548.59 to 504.72 p = 0.311), 2 years WOMAC (277.88 to 256.08 p=0.064) and 2 years SF-36 total (567.00 to 555.71 p=0.800)]. However, the results were not statistically significant. Conclusion: This study demonstrates that patients with multilevel spinal fusion may have worse outcomes after THA than patients with single level spinal fusion. Future larger studies comparing these two patient groups may be sufficiently powered to determine if there is a statistically significant difference in functional outcomes.

Abstract no.: 46427 COMPARISON OF METAL ION CONCENTRATIONS AND IMPLANT SURVIVAL AFTER TOTAL HIP ARTHROPLASTY WITH METAL-ON-METAL VERSUS METAL-ON-POLYETHYLENE ARTICULATIONS: A 16-YEAR FOLLOW-UP OF A PROSPECTIVE RANDOMIZED STUDY Rikard WEDIN¹, Rüdiger WEISS¹, Henrik DAHLSTRAND¹, Andre STARK², Nils HAILER³ ¹Department of Molecular Medicine and Surgery, Section of Orthopaedics

and Sports Medicine, Karolinska Institutet, Karolinska University Hospital, Stockholm (SWEDEN), ²Department of Clinical Sciences, Danderyd Hospital, Karolinska Institutet, Stockholm (SWEDEN), ³Department of Orthopaedics, Institute of Surgical Sciences, Uppsala University Hospital, Uppsala (SWEDEN)

Introduction: Large metal-on-metal (MoM) articulations are associated with numerous problems such as metal wear and corrosion, leading to increased metal ion concentrations and unacceptable revision rates. There are few comparative studies of 28-mm MoM articulations with conventional metal-on-polyethylene (MoP) couplings. We here present a long-term follow-up of a randomized controlled trial comparing MoM versus MoP 28-mm articulations. Methods: Eighty-five patients with a mean age of 65 years at surgery were randomized to a MoM or a MoP bearing. At follow-up after 16 years 39 patients had died and four had undergone revision surgery. Thirteen patients were unavailable for clinical follow-up, leaving 30 patients (n=14 MoM and n=16 MoP) for analysis of metal ion concentrations, kidney function and clinical outcome. Results: Fifteen-year implant survival was similar in the two groups (MoM 96% [95% CI: 88-100%] versus MoP 97% [95% CI: 91-100%], p=0.99). The mean cobalt (Co) concentration was four-fold higher in the MoMcohort (1.51 µg/L) compared with the MoP-cohort (0.35 µg/L, p<0.001), mean chromium (Cr) concentration was double in the MoM-cohort (2.20 µg/L) compared with the MoPcohort (1.03 µg/L, p=0.047). The Harris hip score was not statistically significantly different between the MoM and MoP cohort (p=0.28). Conclusion: This is the longest follow-up of a randomized trial on 28-mm MoM articulations, and although implant survival in the two groups was similar, metal ion concentrations remained elevated in the MoM cohort even in the long-term. The use of such articulations cannot be recommended.

Abstract no.: 46891 THE DAMAGE IN HIP ABDUCTOR MUSCLES AFTER TOTAL HIP ARTHROPLASTY THROUGH THE DIRECT ANTERIOR APPROACH FOR DEVELOPMENTAL DYSPLASIA OF THE HIP

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Introduction Total hip arthroplasty (THA) through the direct anterior approach (DAA) was known to cause less soft tissue damage than other surgical approaches. However, difficult cases, such as developmental dysplasia of the hip (DDH), might often cause muscle damage. The objective of the present study was to clarify the damage of the Gluteus medius(Gmed), the Gluteus minimus(Gmini) and the tensor fasciae latae (TFL) observed one year after THA through the DAA for DDH using magnetic resonance imaging (MRI). Patients and methods We prospectively compared the muscle cross-sectional area (M-CSA) and fatty atrophy (FA) in the Gmed, the Gmini and the TFL by MRI and the Harris hip score (HHS) before and at one year after THA through the DAA in two groups: 40 patients with Crowe group 1 DDH (DDH) and 14 patients with osteonecrosis as a control. Results THA through the DAA for DDH displayed significantly decreased the M-CSA and significantly increased FA in the Gmini and the TFL. However, the M-CSA and FA in the control group did not change between before and after surgery. Postoperatively, no significant correlation was observed between the M-CSA and FA for both the Gmini and the TFL in patients with DDH. No significant difference was observed in the HHS in the two groups. Conclusion THA through the DAA for DDH caused the damage in the Gmini and the TFL in patients with DDH. Soft tissue damage after THA through the DAA for DDH did not affect the HHS.

Abstract no.: 48763 DOES OBESITY AFFECT FUNCTIONAL RECOVERY AFTER TOTAL HIP ARTHROPLASTY? BIOMECHANICAL AND CLINICAL ANALYSIS Pierre MARTZ¹, Davy LAROCHE¹, Abderrahmane BOURREDJEM², Emmanuel BAULOT¹, Paul ORNETTI¹ ¹University Hospital of Dijon, Dijon (FRANCE), ²University of Burgundy Franche-Comté, Dijon (FRANCE)

Introduction: Functional scores after THA are worse or equivalent in obese patients however no study has documented the influence of BMI on the biomechanical recovery during gait. Our hypothesis : BMI \geq 30 kg/m² is associated with a lower recovery of gait kinematics. Material and methods: 76 THA for osteoarthritis were included : Group 1 (G1): 49 with a BMI <30 kg/m2 and Group 2 (G2) : 37 (BMI \ge 30 kg/m2) with a control group of 55 healthy people. A clinical analysis (HOOS) and a 3D gait analysis was performed before surgery and 6 months after surgery : gait velocity and flexion range of the hip (ROM) were analyzed. The functional gain between the two visits were calculated. Results: Preoperative gait speed and hip ROM was significantly lower in obese patients (speed G1 : 0.81±0.22m/s vs. G2: 0.65±0.23m/s, p=0.004 et hip ROM G1: 26.2°±7.3 vs. G2: 21.4°±6.6, p=0.005) and obese were more symptomatic (HOOS G1: 36.7±12.9 vs. G2: 28.1±15.7, p<0.015). At 6 months of follow up the gait speed and the hip ROM was significantly lower for all the patient comparatively to the control group. No correlation between gait speed, hip ROM and BMI was found and biomechanical and clinical gains are comparable for both groups. Conclusion: It confirms the objective functional benefit of THA for all patients: even if they did not fully recover the level of a healthy control person, all patients improved biomechanically and clinically and the gain is comparable regardless of their BMI.
Abstract no.: 47094 FIRST EVER BONE AND JOINT TUBERCULOSIS TREATMENT GUIDELINES

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Introduction: Bone and joint tuberculosis treatment guidelines doesn't exist. Ministry of Health and family welfare Govt. Of india, WHO, AIIMS, cochrhane collaboration framed extrapulmonary TB guidelines. The author was team lead for Bone and Joint group. Methods: Over 8000 abstracts, 1600 full papers were reviewed. Multiple clinical questions for spine, hip, knee, ankle& foot, Shoulder, elbow, wrist and hand were listed. The evidence based answers were drafted, however At some places practice consensus was used to prepare final guidelines. The research guestions needing operational research were listed. Results: The principles of standard of care listed was early diagnosis, tissuebased diagnosis, avoiding invasive and costly tests, compulsory HIV testing, addressing drug resistance, identifying pulmonary TB, ensuring effective continuous treatment. The case definitions were: Presumptive case, bacteriologically confirmed case, Clinically diagnosed case, presumptive relapse, Bacteriologically confirmed relapse, Clinically diagnosed relapse. Successfully treated ,Completed treatment, Presumptive treatment failure, Bacteriologically confirmed treatment failure, clinically diagnosed treatment failure, paradoxical reactions are outcome definitions. The issues of Empirical treatment, PCRbased diagnostics, Radiological imaging for diagnosis, diagnostics in children, Duration of treatment, Diagnostic algorithms for HIV+, Diagnosis&management of drug resistant and paradoxical reactions, Treatment end-points (Radiological imaging), indications of surgical management were defined. The daily dosage (RHEZ 2 and RHE for 10 months) to be evaluated by contrast MRI for further extention is recommonded ATT regimen. Conclusions: this is the first ever guidelines on Bone and Joint TB. Defining the end point of treatment and evidence on GeneXpert and Line Probe assay needs operation research.

Abstract no.: 47007 PROSPECTIVE CLINICAL AND RADIOLOGICAL ANALYSIS OF SPINAL TUBERCULOSIS Roop SINGH

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Introduction: There is not much information about how tuberculous lesions of the spine progress/heal; what clinical & radiological features suggest progression/healing; what is the optimal duration of antitubercular treatment; and what clinical, laboratory & radiological investigations and their frequency should be done to monitor the disease course. The present study aimed to study prospectively clinical and radiological features of spinal tuberculosis. Methods: Fifty spinal tuberculosis patients diagnosed clinico-radiologically were enrolled for the study. Patients were evaluated clinically, radiographically and by magnetic resonance imaging at the regular intervals to monitor the disease course till 24 months. Results: Wedge/ Collapse (23/50 cases), soft tissues mass (29/50 cases), disc narrowing (45/54 discs), end plate erosions (89/107 endplates) were the plain radiological findings. Earliest sign of healing on plain radiography was decrease in fuzziness of end plate ultimately leading to either sclerosis of end plate or fusion of adjacent vertebrae. Initial MRI findings included bone marrow edema (50/50 cases), discitis (53/62discs), end plate erosions (105/123 endplates), pre and paravertebral collections (45/50 cases), epidural involvement (26/50 cases), epidural spread (77/109 vertebrae), and subligamentous spread (42/50 cases). Earliest feature of healing on MR examination were decrease in inflammatory soft-tissue masses and reduction in marrow edema. Conclusions: Presence/absence or increase/decrease in these salient radiological features can utilize to diagnose and monitor disease course in spinal tubercular involvement. Based on the clinic-radiologic findings of the present study, we propose decision-making algorithm; follow-up algorithm; and MR examination protocol for spinal tuberculosis.

Abstract no.: 46739 MANAGEMENT OF TUBERCULOSIS IN DORSOLUMBAR SPINE:A SYSTEMATIC REVIEW

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ABSTRACT Introduction : Tuberculosis of spine is most common infectious pathology affecting the vertebral axis with incidence 40-50 percent. Study Design: A systematic review of literature with search engines like Pubmed, Google scholar (Keywords Pott spine, Pott paraplegia, spine TB, TB spine surgery) was performed for studies with operative management of tuberculous spine involving the dorsolumbar region from 2001 to 2015 and results were analysed regarding the preffered indication and surgical approach for tuberculous spine.. A total of 2024 articles were retrieved related to tuberculous spine in the initial search. Studies involving surgical management were extracted and 240 articles was found to be related with Pott spine surgery. Articles were further scrutinized to look for articles related to tuberculosis dorsolumbar spine with surgical management. 75 articles were found to be related. Further search was to done to look for surgery in case of healed tuberculosis. 14 articles were related and extracted from data. At final 61 studies related to TB dorsolumbar spine with surgical management was considered for analysis.Conclusion:The need for operative intervention is higher. Literature is scarce in view of defining the need for operative intervention and type of intervention needed. No clear guidelines are present to decide for procedure, and its more being surgeon specific rather than disease specific. Most studies available are retrospective with low quality evidence and present need is to design disease specific surgical protocol and good quality evidence for need and type of intervention needed.

Abstract no.: 46662 APPLICATION OF TLIF TECHNOLOGY COMBINED WITH LESION CLEARANCE AND CHEMOTHERAPY VIA CATHETER FOR THE TREATMENT OF SPINAL TUBERCULOSIS

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Abstract Purpose: The aim of this prospective study was to analyze the clinical and radiological outcomes of active thoracolumbar spinal tuberculosis treated by application of transforaminal-lumbar interbody fusion technology combined with lesion clearance and chemotherapy via catheter (TCLC). Methods: We followed 26 patients with active thoracolumbar spinal tuberculosis who underwent TCLC. These patients had posterior stabilization of the involved spine segment. Results: The average follow up was 14.1 months (range: 9-24 months). The kyphotic Cobb angle at presentation, after surgery, and at final follow up were 22.7° \pm 9.8°, 9.8° \pm 7.3°, and 10.3° \pm 8.8°, respectively, with an average correction of 13.1° ± 5.4° after surgery, and a loss of correction of 1.8° ± 1.0° at final follow-up. The rate of correction and loss of correction were 56.6% and 8.3%. Six months after surgery, all abnormal erythrocyte sedimentation rates and C-reactive protein levels had returned to normal. The average union time was about 5.0 months. All patients had bony union, and all patients had improved neurological function, with daily activity returning to normal. All patients had recovered nerve function to grade E at final followup. Bony fusion was observed at final follow-up in all patients. Conclusion: Application of TCLC for the treatment of spinal tuberculosis appears adequate for obtaining satisfactory healing of lesions. Surgical removal of tuberculous lesions as completely as possible with post-surgical chemotherapy delivery for tuberculosis via a spinal catheter is critical for a successful outcome with this technique. Keywords: Spinal tuberculosis, TLIF technology, Chemotherapy catheter

Abstract no.: 46604 A PROSPECTIVE STUDY OF CLINICO-RADIOLOGIC-URODYNAMIC CORRELATION IN PATIENTS WITH TUBERCULOSIS OF THE SPINE Roop SINGH¹, Tanwar MILIND² ¹Pt. B.D. Sharma PGIMS, ROHTAK-124001, INDIA, - (INDIA), ²Pt. B.D.

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Introduction: Involvement of spinal cord in spinal tuberculosis has been associated with bladder disturbances on which literature is scarce. Present study aimed at evaluating the urodynamic profile; its correlation with clinical & radiological features; and prognosis with treatment in these patients. Methods: Thirty patients of spinal tuberculosis were prospectively evaluated clinically, radiologically and urodynamically. All patients underwent urodynamic assessment at presentation; 3, 6 & 12 months. Results: Patients were divided into two groups on the basis of absence (group 1) or presence (Group 2) of bladder dysfunction. The magnitude of deformity (P=0.011), sensory deficit (P=0.025) & tenderness (P=0.030) at presentation were found to be significantly more in Group 2 and involvement of posterior elements, reduction in disc height, end plate erosion and nerve root were significantly higher. Initial urodynamic assessment showed delayed sensations in 23.3% and early sensations in 13.3%; decreased bladder compliance in 3.33%; underactive detrusor in 16.6%, and overactive in 13.3%, and dys-synergic sphincter in 13.3% cases. Statistically significant (P < 0.001) improvement in sensory parameters of bladder, detrusor contractility & compliance with treatment was observed on serial urodynamics after chemotherapy. Patients with bladder disturbances had poorer functional recovery at 6 months. Conclusion: Significant bladder comorbidity is associated with spinal tuberculosis and its presence can be recognized as a poor prognostic factor. Urological morbidity is strongly linked to nerve root & posterior element involvement; reduction in disc height; and end plate erosion. Clinical/neurological improvement correlates with marked radiological & urological improvement.

Abstract no.: 48295 SAFETY OF INSTRUMENTATION IN TUBERCULOSIS OF SPINE, WET LESIONS

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Introduction: treatment of tuberculosis of spine has various modalities ranging from medical to surgical including just drainage of pus to decompression and decompression with instrumentation. The goals of surgery include debridement of the infective focus. In some cases, when surgery causes mechanical spinal instability, the question arises whether the risk of recurrent infection outweighs the benefits of spinal instrumentation and stabilization. Instrumentation helps in preventing progression of kyphosis and helps in maintaining the achieved correction. Material and method: 40 cases of both sex with spinal tuberculosis with instrumentation were reviewed retrospectively medically managed disease and cases without instrumentation were eliminated from this review. At least 30 cases have minimum follow up of one year. Distribution of disease was in all segments of vertebral column cervical, dorsal .lumbar. Anterior decompression was done with autologous bone grafting and instrumentation. Result: result was analyzed clinically and radiologically in form of neurological improvement, correction of kyphosis, maintainance of correction. All patients with wet lesion showed neurological improvement and showed no or very minimal progression of kyphosis. None of the patient showed hardware failure, deep infection, wound infection, required hardware revision. Conclusion: Instrumentation of the spine is safe and has an important role in stabilization of the tuberculosis of spine. Despite the presence of active infection, instrumentation after radical debridement will not increase the risk of recurrent infection. Greater benefit can be achieved through spinal stabilization, which can promote accelerated healing and avoids progression of kyphosis.

Abstract no.: 47988 OPERATIVE TREATMENT FOR L5S1 TUBERCULOSIS ACCOMPANIED WITH PRE-SACRAL ABSCESS THROUGH COMBINED ANTERIOR AND POSTERIOR APPROACH

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Objective: To study the operative methods and effect for L5S1 tuberculosis accompanied with pre-sacral abscess through combined anterior and posterior approach. Methods: 36 patients with L5S1 tuberculosis accompanied with pre-sacral abscess was performed by one-stage debridement and bone grafting through rectus abdominis muscle approach and by lumbar-iliac internal fixation via paravertebral muscle approach after preoperative antituberculosis therapy for 2 weeks, and postoperative antituberculosis therapy was continue for 12-18 months. There were 21 men and 15 women with the average age of 43.5 years old. 36 cases suffered from low back pain and 20 cases from ischialgia. Results: The operation were performed from 1 to 3 hours, with the average period of 1.5 hours, the operative blood loss volume were 100-300ml, with the average period of 150ml. None of operative complication(nerve injury, postoperative infection, tuberculosis recurrence, bone grafting displacement, fixation failure, e.g) was occured, 36 patients were followed-up from 12 to 24 months, with the average period of 18.6months, all of the curative effect were good during the follow-up period, the tuberculosis had been cured, the bone grafting had been fused, the lumbar-iliac internal fixation were firm and 20 cases suffered from ischialgia had been improved at the last follow-up. Conclusion: Because of its debridement completely and fixation firmly and invasive minimally, one-stage debridement and bone grafting through rectus abdominis muscle approach and lumbariliac internal fixation via paravertebral muscle approach is one of ideal treatment for L5S1 tuberculosis accompanied with pre-sacral abscess.

Abstract no.: 47987 OPERATIVE TREATMENT FORTH2-5TUBERCULOSIS VIA AXILLARY MIDLINE TRANSTHORACIC APPROACH

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Objective: To study the operative methods and effectforTh2-5 tuberculosisvia axillarv midline transthoracic approach. Methods :25 patients with Th2-5 tuberculosis performed by one-stage debridement and bone grafting with internal fixation via axillarymidline transthoracic approach after preoperative antituberculosis therapy for 2 weeks, and postoperative antituberculosis therapy was continue for 12-18 months. There were16 men and 9 women aging 26 to 78 year-old, with the average age of 48.2 years old. 10 cases suffered from tuberculosis poisoning symptoms and 8 cases from nerve compression symptomswithvarious degrees, 6 cases combined with thoracic kyphosis deformity. Results: 25 patients were followed-up from 12 to 48 months, with the average period of 24.6months. All cases curative effect were good during the follow-up period, one case got pain and numbness in surgical site after the operation, but itwas rapidly alleviated vianerve nutritional therapy for 2 months. The kyphosis Cobb's angle were corrected with the average angle of 3.66°±0.32°, and the visual analogue scale (VAS) had been improved with an average score of 4.58±1.30, and 8 cases which suffered from neurological symptoms had been improved withdifferent degreesat the last follow-up. Conclusion: Onestage debridementand bone grafting with internal fixation via axillary midline transthoracic approach can achieve the goal of treatment for Th2-5 tuberculosis.

Abstract no.: 47245 DIAGNOSING UPPER CERVICAL EPIDURAL ABSCESS: RETROSPECTIVE ANALYSIS AND REVIEW OF PUBLISHED CASES FROM 1931 - 2015

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Introduction: Upper cervical epidural abscess (UCEA) confined to C1 and C2 vertebrae is a rare surgical emergency. Despite increasing incidence, uncertainty remains around management. Our objective is to provide a comprehensive analysis of the literature from all worldwide published cases. Methods: A comprehensive Medline and PubMed search was undertaken. We used MeSH terms including "Upper cervical epidural abscess," "C1 osteomyelitis," "C2 osteomyelitis," "C1 epidural abscess," "C2 epidural abscess". We excluded cases with tuberculosis. The results were analysed to form a database including patient demographics, presentation, diagnosis, investigations, management as well as outcome. Results: Thirty-two published papers were identified with 43 patients included (29 male, 14 female). Mean age was 35 years old. Average onset of symptoms was over 3.5 weeks and clinical triad of pain, neurology and fever was present in the majority. Mean white cell count was 15 (11-17), mean CRP was 60 (22-98) and ESR 84 (69-93). Staphylococcus aureus was identified as the causative organism in 29 patients. Commonest source of infection was through ear, sinus, tonsils and respiratory tract. Eleven patients suffered from diabetes, with a further 9 immunocompromised. Magnetic resonance imaging was found to be the diagnostic investigation of choice in 80% of cases. A discernible shift towards operative management was seen from 1980 with 78% making a complete recovery. Almost all (95%) patients had at least 6 weeks antibiotics recommended regardless. Conclusion A high index of suspicion is required in diagnosing UCEA. Surgical management of this condition is preferred, with favorable outcomes.

Abstract no.: 48358 THE ROLE OF PERCUTANEOUS TRANSPEDICLUAR BIOPSY IN TB SPINE AND IT'S CORRELATION WITH CLNICO-RADIOLOGICAL FEATURES.

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Introduction: Tuberculosis has long been recognised as a common cause of destructive lesions of spine. However the scenario is fast changing with atypical presentations and increasing reports of non-tubercular affections. This poses a great diagnostic dilemma. Aim: The present study is aimed at evaluating the diagnostic efficacy of percuatneous transpedicluar needle biopsy and correlation of the histology findings with clinicoradiological features. Material and methods: Forty one patients diagnosed as TB spine by their clinical presentations, radiological and MRI features underwent transpedicular needle biopsy under fluoroscopic guidance. Quality of the sample, histopathological and radiological/MRI pictures between the tubercular and non-tubercular lesions were studied. Results: A good sample was obtained in 92.7% of patients. Of these, 28 patients had TB, 3 with nonspecific inflammatory lesions and 7 with other non tubercular conditions (3 pyogenic, 3 metastasis, 1 multiple myeloma). Statistically there were no significant differences among the TB and non-TB groups in terms of vertebral involvement and MRI features. However risk of presentation with cord compression, cord changes and neurodeficit were higher with TB spine. Conclusion: It is always not possible to differentiate between tubercular and non-tubercular pathology of spine only on the basis of clinical and MRI features. It is more difficult in early cases without any neurodeficit. Thus histopathological confirmation is a must for further management and percuaneous needle biopsy is a better option considering the simplicity and minimally invasive nature of the procedure.

Abstract no.: 46871 SELECTION OF SURGICAL APPROACH IN SPINAL TUBERCULOSIS-A MULTICENTER EXPERIENCE OF 621 CASE

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Background: Spinal Tuberculosis is a common form of TB infection (50%-60% of osseous tuberculosis). It still occurs in both developed and developing countries. The diagnosis is difficult and it commonly presents at an advanced stage. Delays in establishing diagnosis and management result in complications such as spinal cord compression and spinal deformity.Methods:621 patients with tuberculosis of the cervical,thoracic and lumbar spine with moderate to severe cord compression were studied. Variable degrees of neurological deficit with deformity were treated from January,2003 to July,2016. Thoracotomy along with anterolateral decompression and autogenous strut bone grafting with simultaneous fixation by screws and rods were done in 113 cases. Posterior decompression, posterior interbody and posterolateral fusion by bone graft with stabilization by transpedicular screws and rods were done in the remaining 508 cases. Anti TB drugs were given to all patients for 12-18 months.Follow-up period was 3 months- 10 years.Results:The average age was 47(9-85) years.All patients survived surgery.There were 8 cases of superficial infection (1.2%) whilst there were 5(0.7%) of deep infections. Revision surgery was performed in 6 patients (1.0%).Implant failure occurred in 5 (0.8%) whilst malposition of screws occurred in 13 (2.1%).Perioperative bleeding were reported for 4 (0.7%).Neurological improvement occurred in all patients except for 2 cases (0.3%). Preoperatively, the majority of patients (n=229, 37%)were classified with Class A on the American Spinal Injury Association (ASIA) neurological impairment scale. This was significantly reduced postoperatively to 0.3%.Conclusions:For patients with spinal tuberculosis anterior debridement, autograft bone fusion, anterior or posterior fixation appears to be effective in arresting disease, correcting kyphotic deformity and maintaining correction until solid spinal fusion.

Abstract no.: 47824 SHORT-SEGMENT VERSUS LONG-SEGMENT STABILIZATION FOR UNSTABLE THORACOLUMBAR JUNCTION BURST FRACTURES. Md Kamrul AHSAN¹, Najmus SAKEB², Mohammed Abdul AWWAL¹ ¹Bangabondhu Sheikh Mujib Medical University(BSMMU), Dhaka (BANGLADESH), ²Community Medical College Hospital, Dhaka (BANGLADESH)

The treatment of unstable thoracolumbar junction burst fractures remains a controversial issue. Retrospectively we evaluate the efficacy of short segment (SS) compared with that of long-segment (LS) stabilization in terms of clinical and the radiological outcomes. There were 36 and 52 patients in the SS and LS- group, respectively. Clinical parameters: back pain, disability, neurological deficit and radiologic parameters: Cobb angle, sagittal index, the kyphotic deformation of vertebral body, vertebral height and canal compromise were measured before surgery and immediately after surgery and at 3, 6 and 12 months postoperatively. The mean age of the patients was 30.6 ± 8.4 and 33.4 ± 8.4 years and the mean follow-up period was 24.5 and 16.8 months . In the SS- group, the fractured vertebral body level was L1, T12, L2, T11 and T10 in 15, 10, 6, 3 and 2 cases and LSgroup, the fractured vertebral body level was L1, T12, L2, T11 and T10 in 22, 17, 5, 5 and 3 cases, respectively. Both groups achieved satisfactory clinical outcomes according to the modified Mcnab criteria. In the SS- group, 8 (22.22%), 21 (58.33%), and 7 (19.44%) cases were considered to have excellent, good, and fair outcome and LS- group, 18 (34.61%), 25 (48.08%), 6 (11.54%), and 3 (5.77%) cases were considered to have excellent, good, fair, and poor outcome, respectively. Short-segment pedicle screw fixation including the fractured vertebral body might be as effective as long-segment pedicle screw fixation for the treatment of unstable thoracolumbar junction burst fracture.

Abstract no.: 48079 OPEN VS MIS PEDICLE SCREW OF THORACOLUMBAR BURST FRACTURES – THE IMPACT OF SURGICAL CORRECTION/LOSS OF CORRECTION ON FUNCTIONAL OUTCOME. ASYSTEMATIC REVIEW AND META ANALYSIS.

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Introduction Thoracolumbar fractures are common fracture, 12% of orthopedic trauma injuries. They can be Stable or unstable, and can be treated conservatively or surgically. The pedicle screw-rod construct is popular methods in posterior instrumentation and fusion, and it can be done through convectional (open) technique or percutaneous minimally invasive technique (MIS) We aim to compare the open VS MIS in regard surgical correction, loss of reduction and its correlation with functional outcome Methods Databases, including MEDLINE, Scopus, Cochrane Library, and Google Scholar were searched for relevant articles published up to June 30, 2016.We performed a metaanalysis to pool data for a comparison of surgical correction as loss of correction of kyphotic angle and vertebral body height and its correlation with functional outcome (VAS, ODI). Results Of the 82 articles identified, 8 studies were eligible for the meta-analysis, with a total of 451 thoracolumbar fractures treated surgically (209 open and 238 MIS). The pooled for surgical correction and loss f of correction of kyphotic angle and vertebral body height showed no difference between open and MIS, but the functional out come and pain score showed superiority of MIS group in 3 months follow up with no difference in last follow up . Conclusion As literature revealed that MIS superior to open surgery in regard of blood loss and operative time, our Meta analysis showed no difference between MIS and open in regards of surgical correction and loss of correction of VBH and kyphotic angle

Abstract no.: 47425 A PROSPECTIVE RANDOMISED DOUBLE BLIND PLACEBO CONTROLLED STUDY COMPARING THE EFFICACY OF BOTROPASE, TRANEXAMIC ACID AND A COMBINATION IN REDUCTION OF BLOOD LOSS IN LUMBAR SPINAL FUSION SURGERY

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Abstract Introduction: Spinal surgeries are associated with significant blood loss leading to perioperative anaemia and increased need for allogenic transfusion . Tranexamic acid competitively inhibits plasmin and botropase(batroxobin) converts fibrinogen to fibrin and theoretically their combination is synergistic. Though tranexamic acid is widely studied in controlling blood loss, there is little information on use of botropase and their combination. Thus we aimed to study the effect and safety of individual drugs and their combination in controlling blood loss in Lumbar spinal fusion surgery. Methods: Hundred patients were randomised into 4 groups. Group B- receive botropase, group T - receive tranexamic acid group BT - receive botropase and tranexamic acid and group P - receive placebo. Outcomes assessed are intraoperative and postoperative blood loss, haemotocrit, allogenic blood transfusion and deep vein thrombosis postoperatively. Result: Mean intraoperative blood loss in Group B, T, BT, and P were 268.32±62.92ml, 340.72±182.75ml, 256.96±82.64ml and 448.44±205.86ml respectively . Post operative surgical site drain collection in Group B, T, BT, and P were 218.00± 100.54ml, 260.40±100.85ml, 191.00±87.84ml and 320.00±125.83ml respectively. Intraoperative blood loss of Group P was statistically higher than Groups B and BT (p<0.001). Mean postoperative surgical site drain collection was statistically significant (p<0.001). No statistically significant differences in fluid administration (p=0.751), blood transfusion (p=1.000), preoperative and postoperative haemoglobin (p and deep vein thrombosis (p=1.000). Conclusion: Botropase and combination of botropase with tranexamic acid significantly reduced perioperative blood loss when compared to placebo.

Abstract no.: 46162 TOPIC USAGE OF TRANEXAMIC ACID VIA A DRAIN PLUS DRAIN-CLAMPING TO REDUCE BLOOD LOSS IN DEGENERATIVE SPINAL DEFORMITY SURGERY

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Introduction: Patients undergoing degenerative spinal deformity surgery (DSD) sometimes suffer large blood loss. In a retrospective study, we explored whether postoperative submuscular retrograde injection of tranexamic acid (TA) and leaving a drain clamp in place for 1 h reduced blood loss. Methods: Patients (n =80) treated with degenerative spinal deformity surgery were divided into two groups: those who had a sub-muscular injection of TA (1500 mg) and drain clamping for 1 h postoperatively (study group, n =40) and those who were not given TA and did not undergo clamping of their drains (control group, n = 40). Postoperative total blood loss, volume of drainage, hemoglobin level, transfusion amounts and rates, D-dimer level at postoperative day (POD) 7, and complications were recorded. Results: Total blood loss, total drainage, mean transfusion volume, and transfusion rates were lower in the study group than in controls (P < 0.001). Hemoglobin levels on PODs 7 was higher in the study group than in controls (P < 0.001). D-dimer level on POD 7 was lower in the study group than in controls (P < 0.05). TXA use was associated with a decrease in the incidence of perioperative complications compared with the control group. There was no difference in the incidence of thromboembolic events. Conclusions: Immediately postoperative sub-muscular retrograde injection of TA and 1 h of drain-clamping effectively reduced blood loss and blood transfusion after DSD surgery. We believe that this method is simple, easy, and suitable for these patients. Keywords: sub-muscula

Abstract no.: 47443 MANAGEMENT OF HANGMAN FRACTURES WITH PERCUTANEOUS AXIS PEDICLE SCREWS FIXATION ASSISTED BY O-ARM

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Objective: To evaluate the clinical outcomes of percutaneous axis pedicle screws fixation assisted by O-arm for Hangman fractures. Methods: From Oct,2015 to Dec,2016, a total of 9 patients with Hangman fractures were treated by percutaneous axis pedicle screws fixation assisted by O-arm. There were 8 males and 1 female. According to Levine-Edwards classification, there were 5 cases of type I,1 case of type II and 3 cases of type IIa. There were 2 case of Frankel grade D and 7 cases of grade E. All the patients received preoperative cervical traction and all the dislocations of axis got reposition while they were still not stable. Then all the cases received treatment of percutaneous axis pedicle screws fixation assisted by O-arm, unilateral fixed in 6 cases and bilateral fixed in 3 cases. In postoperative follow-up, X-ray was taken to observe the internal fixation and cervical motion, while CT scan was taken to observe the fracture healing. Results: The operation time was 70 ~ 130 minutes. All the patients were followed up and the period was from 3 to 15 months. At the last follow-up, the neural function in all the cases reached grade E, the fractures achieved healing and the cervical motion ranges were normal. There were no C2/3 dislocation or screw loosening. Conclusion: For the cases with Hangman fractures, depending on the reasonable choice, the operation of percutaneous axis pedicle screws fixation assisted by O-arm can get good therapeutic effect, with the advantages of small trauma, less bleeding, faster recovery and keeping cervical motion segments.

Abstract no.: 47438

A COMPARISON OF THE MINI-OPEN WILTSE APPROACH WITH PEDICLE SCREW FIXATION AND PERCUTANEOUS PEDICLE SCREW FIXATION FOR NEUROLOGICALLY INTACT THORACOLUMBAR FRACTURES.

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Introduction: To determine which of the two techniques is more suitable for thoracolumbar AO type A3 fractures based on clinical and radiographic results. Methods: We studied 112 patients with thoracolumbar AO type A3 fractures without neurological deficits. 63 patients received PPSF, and 49 were treated using MWPSF. The clinical outcomes described below, the surgery-related results, and the pre- and postoperative radiological findings were compared between the two groups. Results: The length of incision, intraoperative blood loss, postoperative hospitalization time, VAS, ODI, accuracy rate of pedicle screw placement, vertebral body angle (VBA) and Cobb's angle were compared between the PPSF and MWPSF groups, with no significant differences (P>0.05). However, the operating time and C-arm exposure times of the PPSF group were 72.5±7.7 min (55~95 min) and 20.4±3.3 times (17~27 times), respectively, while those of the MWPSF group were significantly lower at 63.3±8.9 min (50~80 min) and 6±2.2 times (4~12 times), respectively (P < 0.05). The operative and postoperative costs totaled 59,346.2±1129.3 CNY (58,000~62,000 CNY) in the PPSF group and 51,692.3±1289.0 CNY (49,000~54,000 CNY) in the MWPSF group, which was significantly lower (P<0.05). Conclusion: Our study found no significant differences in most clinical and radiological outcomes between the two investigated approaches. PPSF and MWPSF are both safe and effective treatments of thoracolumbar AO type A3 fractures. Nevertheless, given the radiation exposure, the special equipment required, the learning curve and the hospitalization costs associated with PPSF, we concluded that MWPSF is the better choice for a primary-level hospital and an inexperienced surgeon.

Abstract no.: 47876 CRANIO-CAUDAL BIOSTRUCTURAL ASYMMETRIES OF VERTEBRAL BODIES- WHY VERTEBRAL FRACTURES USUALLY INVOLVE THE SUPERIOR END PLATE?-

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Purpose: The aim of this study was to determine the structural differences between the superior and inferior halves of the thoracolumbar vertebrae by analyzing the trabecular structures with micro-computed tomography (µ-CT) and measuring the bone mineral density with dual-energy X-ray absorptiometry (DEXA). Materials and methods: Fourty vertebral bodies (T10 through L2) from 8 cadavers were studied. After dividing the vertebral bodies into superior and inferior halves µ-CT images were obtained for analyzing the trabecular structures and bone mineral density was measured by using DEXA scans. During the period from July 2016 to December 2016, the BMD of 20 female subjects aged ≥55 years were studied and analyzed the differences between superior and inferior halves of the thoracolumbar vertebrae. Results: In the cadaver studies, the trabecular bone volume fraction was 18.40% ± 0.22% in the superior and 21.35% ± 1.24% in the inferior half(p = 0.025), the separation between the trabeculae was 0.81 ± 0.02 mm and $0.76 \pm$ 0.02 mm(p = 0.046) and the structure model index was 1.64 ± 0.02 and 1.57 ± 0.01 showing a plate structure in the inferior half (p = 0.004). The BMD was 3.20 ± 0.48 g/cm2 and 3.59 ± 0.92 g/cm² (p = 0.019). The BMD of 20 female subjects was 0.74 ± 0.03 g/cm² and 0.72 ± 0.03g/cm2 without significant difference. Conclusion: The differences of trabecular structures and BMD between superior and inferior halves of thoracolumbar vertebrae could explain that vertebral fractures usually involve the superior end plate.

Abstract no.: 48463 DIAGNOSTIC AND PROGNOSTIC ROLE OF MRI IN SPINAL TRAUMA, ITS COMPARISON AND CORRELATION WITH CLINICAL PROFILE AND NEUROLOGICAL OUTCOME, ACCORDING TO ASIA IMPAIRMENT SCALE

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Aims and objectives: To evaluate the role of magnetic resonance imaging (MRI) as a noninvasive diagnostic tool in patients with acute and chronic spinal trauma and to compare and correlate the MRI findings with those of patients' clinical profile and neurological outcome according to ASIA impairment scale to assess prognostic and clinical value of MRI. Materials and Methods:62 patients of spinal trauma underwent MR imaging and were analyzed and correlated with findings on neurological examination according to American Spinal Injury Association (ASIA) impairment scale (AIS) at the time of MRI examination and subsequently at sub-acute interval to assess neurological outcome. Observation and Results: The cord edema without hemorrhage was the most common MR finding (41.5%). The others were sizable focus of hemorrhage within the cord (33%), epidural hematoma (5.0%), and normal cord (26%). Majority of MR findings correlated well with clinical profile of the patient according to ASIA impairment scale. This study demonstrated that patients with presence of sizable focus of haemorrhage had larger cord edema and more severe grade of initial ASIA impairment scale(AIS) with poor recovery at follow up (P=0.032).Improvement in upper extremity was more than lower extremity. Severe cord compression was also associated with poor neurological outcome; however it was not statistically significant (P=0.149). Conclusions: MRI findings in acute spinal cord injury correlated well with the initial clinical findings and on follow-up according to ASIA impairment scale. MRI is useful for initial diagnosis of acute spinal cord injury and its prognostication for predicting neurological recovery.

Abstract no.: 46786

CUSTOM TUMOUR ENDOPROSTHESES WITH SHORT MEDULLARY STEMS AND EXTRA-CORTICAL PLATES: MINIMISE ASEPTIC LOOSENING IN EXTREME BONE RESECTIONS

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Introduction: Extra-cortical plates (ECP) with short-stem endoprosthetic reconstructions have reportedly encouraging results. Aim: To assess the survivorship of custom endoprostheses with short-stem and ECP compared to standard 150mm medullary stems. Methods: 37 patients had undergone wide local excision of a malignant neoplasm of bone and short-stem endoprosthesis with ECP between 1998 and 2013. Patients were grouped anatomically into; proximal tibial (6), proximal humeral (9), proximal femoral (9) and distal femoral (13) endoprosthetic groups. Implant survivorship was compared to matched standard stem controls. Results: Controls were matched for age at diagnosis, diagnosis, length of follow-up, primary versus revision endoprosthesis, with no statistical differences identified between variables in all four groups. Percentage bone resected was statistically greater in the short stem groups at each anatomical site. Kaplan Meier analysis of implant survival according to anatomical site confirmed no statistical difference between short stem versus controls at the proximal femoral (CI:95%, p=0.57), proximal tibial (p=0.61), proximal humeral (p=0.84) and distal femoral (p=0.054) sites. Overall survival of distal femoral prostheses was 70% at 10-years (95 CI: 57% to 86%), identical to the survivorship in our previously published institutional results (70%). After excluding septic revisions in the distal femoral control group (6), there was no significant difference in aseptic loosening between prosthesis types (p=0.078). Conclusions: This study indicates that short-stem fixation with ECP has demonstrated non-inferiority to matched standard length medullary stem controls. In extreme bone resections and in revision case, the addition of extracortical plates to short medullary stems minimises aseptic failure.

Abstract no.: 46400 PEDICLE FROZEN AUTOGRAFT FOR MALIGNANT BONE TUMORS: SIMPLE AND EFFECTIVE SURGICAL TECHNIQUE FOR BIOLOGICAL RECONSTRUCTION

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Standardizing limb salvage surgery for malignant bone tumors should result in improved limb function after tumor excision and reconstruction. We have developed a method of biological reconstruction using tumor-bearing autografts treated with liquid nitrogen. We report this modified technique using pedicle frozen autografts to save the continuity of anatomical structures. We treated 68 malignant bone tumor patients. Diagnoses of the tumors were 30 osteosarcomas, 23 metastatic tumors, 5 chondrosarcomas, and 10 other sarcomas. The sites of the tumors were 39 femurs, 18 tibias, 10 humeri, and 1 calcaneus. Operative procedures consisted of exposing the tumor, performing one-site osteotomy or joint dislocation, rotating and freezing the tumor lesion in liquid nitrogen for 20 min, and using intramedullary nailing, plates, or composite reconstruction arthroplasty. Postoperative ISOLS function was average 23.1. At the final follow-up, 13 patients had died, and 37 patients remained disease-free for a mean follow-up period of 38.7 months. Eighteen patients were alive but with disease. Complications were encountered 7 deep infections, 4 fractures, 4 implant breakage, 5 local recurrences from surrounding soft tissue, 3 collapse, 2 nonunions, 2 dislocations, and 1 patellar tendon rupture. All were managed successfully. The pedicle frozen autograft, which was newly developed to solve drawbacks of previously reported free frozen autografts, achieved success for reconstruction of malignant bone tumors. This is a new, simple, effective surgical technique for biological reconstruction that is still investigated but has potential for development.

Abstract no.: 46502 DIAGNOSTIC IMAGING METHOD USING MAGNETIC RESONANCE IMAGING OF SUPERFICIAL SOFT TISSUE TUMORS

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Background: Diagnostic imaging method using magnetic resonance imaging (MRI) is one of the useful methods for diagnosis of soft tissue tumors, but soft tissue tumors mostly showed non-specific findings. In this study, we focused on MRI findings of subcutaneous soft tissue tumors, to evaluate the diagnostic usefulness of the relationship between tumors and the superficial fascia in differentiation between malignant and non-malignant lesions. Methods: The data from MRI information from 195 patients (men 101 women 94) with superficial soft tissue tumors, treated from Jan 2007 to Apr 2016 in our institution was collected. The median age at the time of first visit our institution was 54.7 years (range 1-90). The following parameters were evaluated size, margin, lobulation, hemorrhage, edema, and relationship between tumor and superficial fascia based on Galant classification. Comparison was made with definitive histological diagnosis. Fisher test was applied as appropriate. A p-value<0.05 was taken as representing statistical significance. Results: The statistical significance was observed in the factors of size, margin, hemorrhage, edema, and relationship (Galant classification). Discussion: Present study indicated that we should suspect subcutaneous soft tissue tumors as malignant, if there was large size (not less than 5cm), irregular margin, hemorrhage, edema, and relationship of group 4 and 5 on Galant classification about MRI.

Abstract no.: 46685 BODY IMAGE, SELF-ESTEEM AND QUALITY OF LIFE IN PATIENTS WITH PRIMARY MALIGNANT BONE TUMORS

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Introduction: Advances in the management of patients with primary malignant bone tumors improved their survival. However, surviving patients, many of whom are young, are now facing different challenges in their everyday lives. The aim of this study was to assess the quality of life, body image and self-esteem of patients with primary malignant bone tumors. Methods: A total of 65 patients (39 male, 17 female) who were treated with osteosarcoma and Ewing-Sarcoma were included into the study (mean follow-up: 9,1 [+/-6,6] years). The control group consisted of 43 (27 male, 16 female) healthy medical students. Standardized questionnaires were used to assess the quality of life (SF-36), the body image (MBSRQ) and the self-esteem (RSE-Scale). The functionality of the limb was evaluated using the Musculoskeletal Tumor Society Score (MSTS). Results: The SF-36 was significantly decreased in the physical categories in patients with primary malignant bone tumors (p<0,001). Body image perception was significantly lower in the patient-group (3, 41 vs. 3,77; p < 0,001). The RSE-Scale of the patients was not affected and did not show any difference compared to the control group (23,96 vs. 23,95). Patients who had a limbsparing treatment revealed a better function of their affected limb compared to amputations (MSTS: 17.3 vs. 9.0; p<0.05). Conclusion: The physical guality of life and the body image of patients with primary bone tumors are worse compared to a healthy control. However the self-esteem does not seem to be affected by the condition and the medical treatment.

Abstract no.: 47338 3D-PRINTED TITANIUM CUSTOM-MADE PROSTHESES IN RECONSTRUCTION AFTER RESECTION OF BONE TUMORS: OUR INDICATIONS AND FIRST RESULTS.

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Purpose: wide resection is the mainstay treatment for primitive bone tumors; it can be also a good option in long survivors metastatic patients. Reconstruction in limbs is generally performed with modular prostheses whereas composite massive allografts reconstruction is usually indicated when tumor is located in pelvis or scapula. 3D-Printed Titanium Custom-Made Prostheses (3DPTCMP) could be a valid alternative in complex reconstructions. The aim of the presenting paper is to analyze the first 12 prostheses implanted by our research group valuing indications, complications and preliminary results. Methods: the first 3DPTCMP (8 of hemipelvis, one of sacroiliac join, one of scapula, one of proximal humerus and one of metatarsal bones) implanted in two major orthopedic research institutes were considered. The epidemiologic and clinical data were analized. All patients were affected by localized disease, only a patient suffered of multimetastatic epithelioid hemangioendothelioma stable after two years since chemotherapy interruption. At 12 months of average follow-up, 10 patients are free of disease; one died for postoperative complication, the patient affected by foot sarcoma is on chemotherapy for lung metastases without local recurrence. Six out 9 pelvic resections are able to walk with one or two crutches; the last two performed cases are still waiting for weight baring to be allowed. The scapular reconstruction and the humerus homograft resurfacing have a satisfying quality of life with an active abduction of quite 70° and 45°, respectively. The patient with tarsal-metatarsal reconstruction is able to walk totally weight baring with crutches.

Abstract no.: 46495 REINFECTION RATE FOLLOWING MEGAPROSTHESIS RECONSTRUCTION OF A MUSCULOSKELETAL TUMOUR OF THE LOWER LIMB

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Introduction: The aim of this retrospective single centre study was to assess the reinfection rate after septic complications of megaprostheses among possible OP procedures. Material: From 1983 – 2016, 627 patients with a primary replacement of a musculoskeletal tumour of the lower limb and reconstruction by a megaprosthesis were recorded. 83 out of 621 patients available for follow-up experienced an infection (13.4%). Two patients (2.4%) were treated with debridement, 61 patients (73.5%) with one-stage revision, 16 patients (19.3%) with two-stage revision, and 4 patients with amputation. The mean follow up was 133 months (range: 2 - 423 months). Results: The reinfection rates after debridement, one-stage revision, two-stage revision, and amputation were 100% (CI 95%: 20 -100%), 49% (CI 95%: 36 - 62%), 38% (CI 95%: 6 - 76%), and 0%, respectively. A re-reinfection occurred in 100% after debridement, in 44% (CI 95%: 22 - 69%) after one-stage revision, in 55% (CI 95%: 31 – 91%) after two-stage revision, and 0% after amputation. Regarding two-stage revision, there was a statistically significant difference in infection rates between patients treated with complete removal of the megaprosthesis and patients with at least one retained component (Fisher's exact test, p = 0.027). Conclusion: Respecting limb salvage, two-stage revision with removal of all components showed the best results for periprosthetic megaprosthesis infection.

Abstract no.: 47633 FUNCTIONAL OUTCOME FOLLOWING ECRT FOR LOWER LIMB TUMOURS

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Extra Corporeal Radio Therapy is a commonly used method in limb reconstruction following tumor excision with few studies evaluating the functional outcome. The aim of our study was to evaluate the functional outcome in patients undergoing ECRT for tumors of the lower limb. A prospective observational study carried out between January 2007 and January 2016, evaluating a total of 37 patients who underwent ECRT for malignant tumors of the lower limb. Patients received chemotherapy wherever required as per protocol. Post tumor resection we debulked the tumor and irradiated the specimen with one dose of 50 Gy. The irradiated bone was reimplanted and fixed with necessary metalware. There were 23 males and 14 females in the study. Average age was 18.6 years (4-38 yrs). Average follow-up was 3.7 years. Femur was the commonest bone involved (n=14) followed by Tiba (n=11), Humerus (n=9) and the Pelvis (3). Ewings sarcoma was the commonest histopathological diagnosis (n=20) followed by Osteosarcoma (n=6), MFH (n=3), Chondrosarcoma (n=4), Pleomorphic sarcoma of bone (n=2), Hodgkins Lymphoma of bone (n=1) and Clear Cell Sarcoma (n=1). Average time to union was 8.6 months, which was achieved in 25 patients. Average MSTS score at 3 years was 25.4. Infection was the commonest complication (n=12). 9 patients died due to disease (at an average of 13.2 months after surgery) and 2 patients were alive with disease. 2 local soft tissue recurrences seen though no local bony recurrences. ECRT is therefore a biological and cost effective method of limb reconstruction following tumor resection.

Abstract no.: 48497 EFFECTS OF SURGICAL TREATMENT WITH CHONDROBLASTOMA IN CHILDREN AND ADOLESCENTS IN OPEN EPIPHYSEAL PLATE OF LONG BONES

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The purpose of present study was to observe surgical effect of chondroblastoma on open epiphyseal plate of long bones in children and adolescents and explore impacts on limb growth and development. Herein, we retrospectively reviewed 18 cases of long bone chondroblastoma with open epiphyseal plate during March 2004 to October 2010. All patients were treated with meticulously intralesional curettage and inactivity with alcohol followed by bone grafts. All cases were followed up from 5 to 11.5 years (8.83±1.89 years mean). All had no local recurrence and distance metastasis. The length of affected limb was shorted from 1.5 to 30mm (18.47±7.22mm mean). There was no obvious relativity with tumor activity (P=0.061). Meanwhile, while there were obvious relativity with the greatest dimension of the lesion (TGD) (P=0.003), the vertical dimension between edge of lesion and epiphyseal line (TVD) (P=0.010) and area ratio of lesion to local epiphysis (Lesion / Epiphyseal plate) (P=0.015). The MSTS93 and SF-36 had been significantly improved (P<0.01). In conclusion, managing of chondroblastoma located in open epiphyseal plate of long bone with meticulously curettage, inactivity and bone grafts can control tumor progression and recurrence effectively, which induce limb to shorten for children and adolescents. However, limb function is significantly improved.

Abstract no.: 46373 CLINICAL MANAGEMENT OF SKIN INVOLVEMENT OF SOFT TISSUE SARCOMA

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Introduction: Malignant soft tissue tumors can invade skin and occasionally present malignant wounds characterized by bleeding, exudate, odor, and infection. Bleeding from the tumor impairs patients' quality of life and can be life threatening. This study aimed to highlight the clinical problems associated with skin involvement of malignant soft tissue tumors. Methods: The patient group comprised 13 males and two females, with ages ranging from 23 to 87 years (mean 67±17). The average follow-up was 26.2 months. Clinical information concerning the problems and treatment courses associated with skin involvement of soft tissue sarcoma was investigated. Results: Skin involvements were observed in 10 of 15 cases in male patients over 65 years. Tumors were located in the chest wall in six cases. The mean diameter of tumors was 8.6 cm, and in 13 cases the histological diagnosis was high grade sarcoma. Skin involvement resulted in malignant wounds in 10 individuals. Six cases had undergone previous surgery. Surgical removal was done in 11, and amputation in two. Two patients received palliative treatment. After tumor removal, eight cases needed skin reconstruction, five by major musculocutaneous flap and three by skin graft. The 1-year survival rate was 69.5%, and the 5-year survival rate was 55.6%. Conclusions: Wide resection and skin reconstruction was generally necessary to achieve local control, because of the large skin and soft tissue defects. To avoid exacerbating the systemic condition, topical Mohs' paste and zinc oxide starch powder was used as palliative treatment or for pre-operative local control.

Abstract no.: 46540 OUT-OF-POCKET PAYMENT FOR SEGMENTAL ENDOPROSTHESIS REPLACEMENT: CHALLENGES AND OUTCOME

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PURPOSE; In the absence of adequate health insurance coverage, most of the healthcare cost is borne by patients at the point of care through 'out of pocket payment' at the point of care. Hence, reconstruction for extensive bony and soft tissue defects in a resource poor environment is delayed by the cost of the endoprosthesis. This case series elucidates the peculiarities and outcome in 12 patients treated with endoprosthetic replacement for limb salvage in a resource constrained environment. METHODS Twelve patients underwent endoprosthetic replacement for bone defects of various aetiology. Patients demographics, cost of endoprosthesis and hospital stay were recorded. Functional outcomes were also determined using the MSTS score. All the included patients have minimum of 6 months follow up. RESULTS The cost of hospital stay and endoprosthesis was between 2500 -9250 US dollars. The average symptoms interval was 20.7 months (3 - 60 months). Ten patients had proximal and distal femoral replacement, while two patients had proximal tibial replacement. Mechanical complication rate was 10%. Non mechanical complication rate was 40%. The average MSTS score was 81% (24-96%). CONCLUSION With the high cost of endoprosthesis, there was significant delay between symptoms interval and definitive surgery. The poorest outcome was reported in a patient who was managed for recurrent plasmacytoma with prolonged interval before reconstruction. Despite the cost of the endoprosthesis occasioned by out of pocket payment, all the patients were emotionally satisfied with the option of the endoprosthetic reconstruction compared to amputation.

Abstract no.: 48753 IS A PRE-OPERATIVE GROUP AND SAVE NECESSARY FOR ORTHOPAEDIC PATIENT WITH EMERGENCY UPPER AND LOWER LIMB PATHOLOGIES?

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Background: Excessive blood loss in emergency orthopaedic surgery may result in allogenic blood transfusion. However, In low risk operations, excessive group and saves (G&S) may result in an added unnecessary cost to hospitals. Methods: Patients \geq 18 undergoing any emergency orthopaedic procedures on the wrist, hand, ankle and foot were identified from a prospectively collected database over a one month time period. Patients were excluded if they were admitted as major trauma call (as defined by local protocol) or sustained an open fracture. The cost of a G&S was derived from our pathology department. Results: 113 patients (61 Male, 53 Female) with an average age of 41 years were included. The median ASA grade was 1. There were 63 G&S taken, at a cost of £3.43 (USD\$4.21), resulting in a total of £216.09 (USD\$266.88) being spent. 39 patients didn't have pre-operative bloods whilst 94 patients didn't have post-operative bloods. The pre-operative haemaglobin was 136 g/dL (±14.6) and the postoperative haemoglobin was 126 g/dL(±17.6). No patients required a blood transfusion. This resulted in a total of £216.09 being spent on group and saves. Conclusions: This study suggests patients with uncomplicated foot, ankle, wrist and hand emergency orthopaedic operations can have a pre-operative G&S safely omitted. This may result in a significant cost saving to hospitals.

Abstract no.: 47667 DETERMINANTS OF REOPERATION FOLLOWING LOCKED NAIL MANAGEMENT OF TIBIA SHAFT FRACTURES

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Tibia shaft fracture is the most common long bone fracture in orthopaedic practice and the treatment of these fractures in adults is evolving. Despite the overwhelming support for the use of locked nails for tibia shaft fractures, it is sometimes associated with complications that may require reoperation. This study aimed to describe and evaluate the predictors of reoperation for patients who have fractures in the tibia shaft managed with locked intramedullary nails. This was an observational study in which we evaluated 133 tibia fractures. Consecutive patients who had locked intramedullary nailing done between 2007 and 2014 for tibia fractures were identified and reviewed. We excluded patients with intra articular extension of their fractures into either the knee or ankle joints. Among the 133 patients who had locked tibial nailing done within the study period, 9 were found to require reoperation. The most common indications for reoperation were wound breakdown and wound infection as noted in five of the nine patients who required reoperation. The cadre of surgeon and use of open or closed reduction technique, did not have a significant effect on reoperation. In this study, 93% of fractures healed uneventfully without a need for reoperation. We found that reoperations were more in patients who had open fractures and there was little impact of the cadre of the surgeon and the reduction technique on reoperation rate. A larger study may be required to propose a predictive model for reoperation.

Abstract no.: 46463 RIVAROXABAN VERSUS ENOXAPARIN IN COAGULATION TEST

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Purpose: Embolism in orthopedic surgery, coagulation disorders, such as a variety of ways for the prevention of complications of anticoagulation therapy with medication is being done well. The purpose of this study, a representative of the anticoagulation therapy with enoxaparin and drug rivaroxaban of coagulation tests performed in patients between the two groups was to determine whether statistically significant differences. Objects and methods: In 60 knee patients underwent arthroscopic surgery(mean aged 54; female 35 case, male 25 case), we measured coagulation function test and platelet count. In the preoperative exam, patients that have severe liver disease or abnormal coagulation test result was excepted. Coagulation test included PT INR, PT %, PR sec, aPTT. Enoxapain group got medication once per a day, preoperative 12 hours ago, in subcutaneous, and rivaroxaban group got medication once per a day, postoperative 6 to 8 hours later. We examined coagulation test preopaerative and postoperative 5 days later, and we compared between two groups . Result: Preoperative coagulation tests coagulation tests before the item was not significantly different between the two groups. (p=0.584) 5 days after surgery, the coagulation tests coagulation tests performed on all items, rivaroxaban showed an increase in the anticoagulation activity Between the two groups showed statistically significant difference (p=0.001), Conclusion: Our results indicate that orthopaedic surgery can induce a lot of bleeding will be careful for use of rivaroxaban

Abstract no.: 46490 CRITICALLY ILL, POSTOPERATIVE ORTHOPAEDIC TRAUMA PATIENTS - FACTORS INFLUENCING MORTALITY FOLLOWING INTER-HOSPITAL TRANSFERS

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Introduction: Inter-hospital patient transfers for services unavailable at index centres need judicious consideration. We analysed outcomes of critically ill, postoperative, trauma patients transferred to a tertiary care centre from less-equipped hospitals and identified factors influencing mortality in them. Methods: The study was conducted at a 300-bedded multi-speciality, tertiary care teaching centre with round-the-clock super-specialist services and a 42-bedded fully-equipped intensive care unit (ICU). Critically ill, postoperative, orthopaedic trauma patients transferred to our ICU from other hospitals between 2012 and 2015 were retrospectively analysed. Patients operated in the same facility, nonorthopaedic trauma, post-elective surgeries were excluded. Demographic, preoperative and operative data, reasons for transfer, details on arrival and outcomes were analysed. Univariate analysis was performed with death as the outcome measure to identify factors increasing mortality in these patients. Results: Of 45 postoperative, critically ill orthopaedic ICU admissions, 18 died from respiratory, renal and multi-organ failure. Univariate analysis revealed: age ≥ 60 years, an age-factored Charlson Comorbidity Score ≥ 5, an interval of ≥ 5 days between injury and surgery, the presence of a femur fracture, a delay in transfer postoperatively by \geq 4 days, transfer from level 2 trauma care centers, renal complications (acute renal failure) and sepsis at admission to be associated with statistically significant mortality. Conclusions: At the time of trauma, risk-based identification of patients can influence the index hospital admission and definitive management at multi-specialty centres. This can reduce morbidity and mortality among orthopaedic trauma patients requiring later transfer to higher centres with poor eventual outcomes.

Abstract no.: 48527 THE CLINICAL EFFICACY OF PERCUTANEOUS KYPHOPLASTY FOR THE MANAGEMENT OF OSTEOLYTIC THORACOLUMBAR TUMOUR Jiancheng ZENG

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PURPOSE: To evaluate the clinical efficacy of for the management of osteolytic thoracolumbar tumour.METHODS: From October 2008 to February 2011, 52patients suffering from osteolytic thoracolumbar tumour were treated by percutaneous kyphoplasty. There were 28 males and 24 females, with an average age of 57.6(range from 39 to 67 years old). There were 29 metastatic percutaneous kyphoplasty osteolytic thoracolumbar tumour, 15 myeloma and 8 angioma. All patients had the symptom of low back pain however without neurological symptoms and apparent spinal canal compromise on image materials. At the same time, relative radiotherapy and chemotherapy were given to metastatic tumour and myeloma according to the nature of the tumor. The surgical efficacy by Oswestry disability index(ODI) and Visual analogue were evaluated scale(VAS).RESULTS: The follow-up investigation ranged from 16to 57months, with an average follow-up time of 24.6 months. The average VAS scores of all the patients were 8.5, which reduced to 2.1 one day after the surgery, to 2.8 three months after the operation and to 3.2six months after the operation, which had significant differences preoperatively and postoperatively(p<0.01). The average ODI scores of all the patients were 73.5, which reduced to 12.1 one day after the surgery, to 18.8 three months after the operation and to 23.2six months after the operation, which also had significant differences preoperatively and postoperatively(p<0.01). Cement leakage happened in 4 cases, however without clinical symptom.CONCLUSIONS: percutaneous kyphoplasty is a safe , effective and minimally- invasive way for the management of osteolytic thoracolumbar tumour, which can relieve pain apparently and improve patients'living standard.

Abstract no.: 47138 MEGAPROSTHESIS IN POST TRAUMATIC AND PERIPROSTHETIC SEPTIC

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Introduction: Recently the evolution of prosthesis technology allows the surgeon to replace entire limbs. These special prostheses or megaprostheses were born for the treatment of severe oncological bone loss. Recently, the applications of these devices are expanding to other orthopaedic and trauma situations. Since some years we are implanting megaprosthesis in non-oncological conditions such as: acute trauma in severe bone loss and poor bone quality; post-traumatic failures; major bone loss in prosthetic revision; periprosthetic fractures with components mobilization and poor bone stock condition. Objectives: The purpose of this study is to evaluate retrospectively the complications during and after the implantation of megaprosthesis in post-traumatic and prosthetic bone loss and to propose some tips about how to avoid and manage such complications. Methods: We have retrospectively evaluated all the complications and difficulties encountered during or after the implantation of megaprosthesis in non oncological patients. Results: problems found were: restoration of the correct length and rotation of the reconstruction of knee extensor mechanism, trochanteric limb, reconstruction. stability/dislocation of the implant, mobility/ROM of the implant, skin cover, sepsis and bone quality. Conclusions: Megaprosthesis in severe bone loss can be considered, in selected cases, as an available solution. Surgical technique and the system implantation must be extremely rigorous ensuring a long longevity to the prosthesis. The characteristics of the bone and soft tissue conditions are very different from those presented by oncological patients, creating critical problems that the surgeon should know and be able to manage avoiding serious complications.

Abstract no.: 46785

PROBIONIBACTERIUM ACNES- AN UNDERESTIMATED PROBLEM OF THE SURGICAL TREATMENT OF CLAVICLE INJURIES? PRELIMINARY RESULTS OF THE HAPDICS-GROUP

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The significance of positive cultures in trauma fixation-device is questionable, especially if clinical signs and symptoms of acute or chronic infection are lacking. Here we tested the hypothesis that fixation devices of clavicle and ankle could be colonized with bacteria without leading to clinical disease. Herein, we present our one year results. Exclusion criteria was any history of implant infection and the intake of antibiotics two weeks prior to the removal. A sonication procedure of the fixation-device was applied and additionally intra-operatively taken tissue specimens were cultured. In total 19 patients (mean age 39.0 years) with a clavicle and in 11 patients (mean age 42.1 years) with a fibula osteosynthesis were included. The reasons for removal of the fixation-devices were in most cases patient's request or pain/foreign body sensation. The microbiological results revealed a Probionibacterium acnes growth in 15 out of 19 patients in the clavicle group whereas none bacterial growth was found in the ankle group. Polymicrobial cultures were obtained from 3 patients. Chi square test showed no correlation between clinical complaints or pre-operatively laboratory infection parameters and the observed bacterial contamination (p>0.5). No complications occurred post-operatively. This high rate of bacterial colonisation even in the absence of clinical signs of infection must alert every surgeon if revision surgery of the clavicle is necessary. Further histo-pathological analyses will make a distinction between sole and true infection possible. However, it will still be difficult to rate the concrete clinical significance of P. acnes.
Date: 2017-12-02 Session: Trauma Miscellaneous Free Papers Time: 10:30 - 12:00 Room: 01. Auditorium II

Abstract no.: 46635 POST TRAUMATIC STIFF ELBOWS – OPEN ARTHROLYSIS THROUGH TRAP APPROACH Deepak KAKI

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Introduction : Native guack treatment for trauma is still a common practice in the developing world. Elbow stiffness resulting from either neglected trauma or inadequate postoperative physiotherapy is quite disturbing both for the patient and caregiver. Malunions, Intra articular adhesions, soft tissue contractures, heterotopic ossification are the offending factors either in isolation or in combination. Various approaches have been employed for open arthrolysis. Arthroscopy has its own role in selected cases. We intend to study the applicability of TRAP [Triceps Reflecting Anconeus pedicle] approach in performing arthrolysis in stiff elbows.Materials & methods : 26 patients presenting with post traumatic stiff elbows were operated upon through TRAP approach for open arthrolysis.15 were females,11 were males. The mean age was 30.88 yrs. The mean duration of arthrolysis after unsuccessful physiotherapy was 14 months. The mean arc of flexion was 50.7 degrees. The mean oxford score was 21.8, the mean MAYO score was 77.3 Results : The mean arc of flexion improved to 89.3 degrees, the mean Oxford score became 40.3, the mean MAYO score became 90. No patient had instability., 2 patients [7.7%] had neurapraxia which improved over time, 2 patients [7.7%] had a painful elbow.Conclusion : TRAP approach is a "Bare it all" approach which provides access to deal with almost all the offending factors and when supported by intensive, supervised physiotherapy, translates into a successful clinical outcome.

Date: 2017-12-02 Session: Trauma Miscellaneous Free Papers Time: 10:30 - 12:00 Room: 01. Auditorium II

Abstract no.: 47846 EPIDEMIOLOGY OF DELAYED UNION OF LONG BONES

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Introduction: In India, the availability of fracture healing therapies to the general public is limited. The infrastructure of the health system in India, involving both public and private sector does not provide adequate opportunity for rural and low-income inhabitants to access the needed care. Due to these reasons, majority of the global burden of injuries are borne by low and middle-income countries. Aim: To Study The Epidemiology Of Delayed Union Of Long Bones. Material and Methods: Patients getting admitted in AVBRH hospital above the age of 18 years of either sex with radiological features of delayed union. Study was a prospective, case control observational type carried out in a rural health setup at AVBRH. It comprised of 153 patients out of which 43 patients had delayed union of a long bone, 53 patients had non-union. These patients were compared with 57 patients that had postoperative fracture union which were included as a control group who had the same risk factors for delayed union. Results: Aging, female gender, comminuted and segmental fractures, higher grades of soft tissue injury, smoking, and infection were found to be independent risk factors for delayed union in long bone fractures. Among the risk factors, smoking and infection can be controlled to decrease the prevalence of delayed union. Conclusion: It is necessary that we create awareness about the importance of primary treatment like immobilization and wound debridement, as patients should reach as early as possible.

Abstract no.: 47978 REVISION FOR SYMPTOMATIC PSEUDOTUMORS FOLLOWING PRIMARY TOTAL HIP ARTHROPLASTY WITH A NON-METAL-ON-METAL BEARING SURFACE AND A STANDARD FEMORAL STEM Henrik BODÉN Danderyds Hospital, Karolinska Institute, Stockholm (SWEDEN)

Background:Pseudotumor formation following total hip arthroplasty is a well-known complication, until now associated mainly with Metal-on-Metal (MoM) bearings and taper corrosion on dual-taper modular femoral stems. The purpose of this study was to determine the prevalence of revision surgery for symptomatic pseudotumors in a large cohort of patients undergoing primary surgery with a standard stem. Methods: We included 2102 patients with 2446 total hip arthroplasties during 1999-2016 in a prospective, observational cohort study. All patients were operated on with the same uncemented femoral stem with non-metal-on-metal articulation. Metal artifact reduction sequence magnetic resonance imaging (MARS-MRI) were used for diagnosis and serum metal-ion levels and serum inflammatory markers were collected on pseudotumor cases. Results: The prevalence of revision for symptomatic pseudotumor formation was 0.5% (thirteen cases) and the incidence rate was 0,9 cases per 1000 person-years. All thirteen cases had a metal-on-polyethylene articulation. Preoperative test results included an elevated Creactive protein level in 11/13 of patients. Cobalt and chromium blood levels were available for eight of the thirteen patients. Cobalt was elevated above the proposed safe level of 5 µg/L in three of the patients. Chromium was not elevated above the proposed safe level in any of the patients. Conclusion: This study describes the prevalence and incidence of revision surgery due to symptomatic pseudotumor formation in a large cohort of patients operated on with a non-Metal-on-Metal bearing. Further studies are required to solve the question why these fairly common adverse events occur. Level of evidence: II Prospective cohort study

Abstract no.: 47869 IMPACTION BONE GRAFTING WITH CEMENTED STEM IN FEMORAL STEM REVISION WITH SEVERE FEMORAL BONE DEFECT

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Purpose : To evaluate the clinical and radiological results of impaction bone grafting with cemented stem using deep freeze allograft in femoral stem revision with severe bone defect. Materials and methods : From Dec. 2000 to Jun. 2010, 17 patients (17 hips) underwent femoral stem revision using impaction bone grafting with cemented stem due to severe bone defect (Paprosky type IV). Twelve patients (12 hips) who were followed up more than 3 years were enrolled. There were 5 males and 6 females and the mean age was 61 years old (range, 40 to 76 years old). The mean follow-up period was 5.8 years (range, 3 to 14 years). The causes of revision surgery were 6 cases of infection, 5 cases of aseptic loosening. Exeter (Howmedica, International Ltd, London, UK) was used for all the femoral stem revision surgery. The used allografts were deep freezed allograft preserved in our surgical bone bank. Results : Harris hip score was improved from 63.1 preoperatively to 81.1 at the final follow-up. There was no thigh pain and limping gait. The average subsidence of the femoral stem in the cement was 2.82 mm (range, 0 to 4.18 mm), and the femoral stem with the cement in the femoral canal was 0.42 mm (range, 0 to 1.83). Grafted bone incorporation and trabeculation was observed in all of the cases. There was no loosening and osteolysis around the femoral stem and acetabular cup. There was no infection, dislocation, periprosthetic fracture.

Abstract no.: 47027 A SYSTEMATIC REVIEW OF RECONSTRUCTION FOR FAILED ACETABULAR COMPONENT IN THE PRESENCE OF SEVERE BONE LOSS.

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Background: Acetabular revision especially in the presence of deficient bone is challenging. Insufficient literature exists critiquing techniques of revision acetabular reconstruction and their outcomes. This study provides systematic review of the literature and reports clinical outcomes and survival of contemporary acetabular revision arthroplasty. Methods: Full-text papers, and those with an abstract in English published from January 2001 to December 2015, were reviewed. Two independent reviewers used a standardised proforma. Clinical, functional and radiological outcomes were evaluated. Results: Fifty papers of level IV scientific evidence, comprising 2811 hips in total, were included. TM cups were used in 1021 hips reconstructions, showing a revision rate of 7.3% at mean follow-up 48.9 months. Eight hundred and thirty one hips were reconstructed with cage and ring devices, with a mean re-operation rate of 11.0% at mean follow-up 87.5 months. Two hundred and three hips were reconstructed using oblong 5.9% re-operation rate at mean follow-up of 90.9 months. In 518 hips jumbo cups were implanted, 12.1% were revised at mean follow-up 117.4 months. Custom-made triflange cups were used in 238 hips 15.9% were revised at a mean follow-up 57.9 months. Conclusions: Key features and outcomes of different techniques are highlighted. Instability is the most common complication. In particular oblong and TM cups have successful longterm survivorship (4 to 9 years) and our results suggest these devices as preferable choice especially in moderate to high-grade acetabular defects. For hip revisions following the development of pelvic discontinuity custom-made triflange cups may have a role.

Abstract no.: 47353 SHORT TERM OUTCOME OF ACETABULAR DEFECT RECONSTRUCTION WITH TRABECULAR METAL AUGMENTS

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Although Burch and Schneider cage reconstruction with allograft has been used traditionally in major acetabular bone defects, high rates of mechanical failure have been reported in type III acetabular defects. Recently porous trabecular metal augments have been introduced with, excellent biomechanical characteristics and biocompatibility, allowing early stability and greater bone ingrowth. We performed, 22 revision THA and 6 primary THA (total 28) using trabecular metal augments to reconstruct acetabular defect between 2011 to 2015. Among 28 patients, 18 were males, 10 females. Mean age of patients was 61.21 years. Paprosky classification for acetabular bone defects was used. Post operatively, all patients followed up for clinicoradiological outcome. Average follow up was 22 months. Clinical outcome assessed using Harris hip score (HHS) and radiological outcomes as osteolysis in acetabular zones and osseointegration, according to Moore's criteria. HHS improved from 58.00 to 87.20. Degree of cup abduction at final follow up was 44.29. Centre of rotation of hip joint corrected from 38.90 mm preoperatively to 23.85 mm postoperatively. Among 28 patients, 18 patients had three or more signs of osseointegration (Moore's criteria), during final follow up and 10 had one/two signs. Trabecular metal augments provide early stability to acetabular cup and help bring down the centre of rotation of hip joint within limit of 35mm and facilitate osseointegration. Our study showed that trabecular metal augments were highly satisfactory in short term. However, long term study is required for better evaluation.

Abstract no.: 48373 TANTALUM METAL ACETABULAR COMPONENT IN REVISION HIP ARTHROPLASTIES. OVER 10 YEARS RESULTS IN 100 PATIENTS.

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We report mean 11 (10-12) years results of the 100 consecutive patients who underwent TM acetabular revision in 2004-2006. The mean age of the patients at the time of operation was 70 (49-92) years, and the average interval from the primary operation was 10 (1-23) years. The patients were classified according to Paprosky classification (gr I = 21, gr IIa = 9, gr IIb = 28, gr II c = 33, gr IIIa = 6, gr IIIb = 3). Screws were used in 62 of 100 operations as additional fixation and morsellized bone allograft were used to fill bone defects in 40 of 100 patients. In 17 of 100 operations also the femoral component was revised. The clinical outcome of the patients was satisfactory. Four patients required revision due to deep infection. Two of these patients required two-stage re-revision arthroplasty. Fourteen patients dislocated their revised total hip arthroplasty due to poor soft tissue quality or lack of co-operation. In radiological analysis good bone ingrowth was seen between the acetabular shell and the host bone in all but one infected patient. None of the TM cups were revised due to aseptic loosening. The present study showed that trabecular tantalum metal acetabulum component shows good long-term (10-12 years) results in acetabular revision arthroplasty.

Abstract no.: 46640

UNCEMENTED STEMS HAVE A HIGHER RISK FOR FRACTURE, BUT A LOWER RISK OF CAUSING VANCOUVER TYPE C FRACTURES: AN ANALYSIS OF 840 POSTOPERATIVE PERIPROSTHETIC FEMORAL FRACTURES.

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Introduction: We evaluated if uncemented stems have an overall higher risk of postoperative periprosthetic femoral fractures (PPFF) compared to cemented stems and different distribution when related to the Vancouver classification. Methods: All primary conventional THRs performed in Sweden between 2001 and 2011 and reoperations due to postoperative PPFF were recorded after cross-matching between the Swedish Hip Arthroplasty Register (SHAR) and the National Patient Register (NPR). Hip resurfacings and tumor prosthesis were excluded. We also excluded deep infections at the time of PPFF, fractures around secondary stems, pathological fractures, perforation without fracture and intraoperative fractures. The fracture type, according to the Vancouver classification, was evaluated based on the medical charts. Statistical calculations (logistic regression) were done using IBM SPSS statistics 23. The study was approved by the Central Ethical Review Board in Gothenburg. Results: Totally, 152475 THRs (82.4% cemented), and 840 reoperations (82.3% cemented) due to postoperative fracture were included in the analysis. Uncemented stems, when compared to cemented stems, had 1.6 times higher risk for fracture (p<0.001). Vancouver type B2/B3 fractures were more common in uncemented stems, whereas type C was more common in cemented stems. Discussion: This study shows a higher risk for Vancouver type C fracture in cemented stems. To our knowledge this is not reported in earlier studies. Uncemented stems have an overall higher risk of postoperative periprosthetic femoral fractures.

Abstract no.: 47499 PROXIMAL FEMORAL REPLACEMENT – A SOLUTION FOR PROFOUND FEMORAL BONE LOSS?

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Introduction: Bone loss of femur continues to be a major challenge in revision hip arthroplasty. Proximal femoral replacement (PFR) has already been popularised for tumour surgeries. Our study explores PFR as a possible solution for the management of complex hip revisions. Method: Thirty consecutive hips (29 patients) that underwent PFR between January 2009 and December 2015 were reviewed retrospectively for their clinical and radiological outcomes. The Stanmore Modular Endoprosthetic Tumour System (METS) was used. Results: Mean age at the index surgery (PFR) was 72.7 years (range 50-89) with number of previous hip arthroplasties ranging from 1-5. With a mean follow up of 32 months, there was 1 early failure due to intra-operative perforation of femoral canal needing further revision. Instability was noted in 8 hips, of which, 7 needed further revision with constrained sockets. Deep infection was noted in 6 hips, of which, 4 were primarily revised with PFR for septic loosening. However, further re-revision in these patients was obviated by their medical conditions. There were no peri-prosthetic fractures and no mechanical failure of the implants. Conclusion: Severe proximal femoral bone loss in complex revision arthroplasties has necessitated the use of proximal femoral replacement prosthesis. Our study concludes that PFR is a mechanically viable option as there have been no peri-prosthetic fractures and no implant failures. Significant numbers of dislocations could be attributed to the poor soft tissue envelope around the hip. We recommend cautious use of PFR in selected patients for proximal femoral bone loss.

Abstract no.: 48039 IS IT REASONABLE TO USE DUAL MOBILITY CUP (DMC) IN TOTAL HIP ARTHROPLASTY (THA) FOR ALL CASES? ABOUT A COMPARATIVE SERIES OF DMC IN PATIENTS UNDER 55 YEARS OLD, OVER 10 YEARS FU.

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INTRODUCTION Long term results of DMC has demonstrated it efficiency to prevent THA instability. The use of DMC for primary THA hip is still controversial as indications have been limited to revision cases, PFF and high-risk patients. However, good results are also established to day for specific categories of patients requiring a THA like ONA, obese or hip tumours. For us it is necessary to demonstrate that implant improvement might authorize us to widen DMC indications. MATERIAL AND PATIENTS Since 1998, colleagues from Nice city have been using DMC in all THA cases. In order to justify these indications we report: 1 clinical and radiological outcomes in a population under 55 years old with a minimum follow up of 10 years. (n=119, 2000-2005: group 1) 2- we compare these results to patients aged over 55 years undergoing the same implants with also a minimum follow up of 10 years (n=444, 2000,2002; group 2). RESULTS The rate of lost to FU was respectively 6.7% with a mean age of 49.9 y, in-group 1 and 8.1% with a mean age of 72.3 y in-group 2. There was no dislocation in the both series, no Intra Prosthetic Dislocation. Devane classification; Harris, PMA and Oxford scores were improved but no differences could be found. At the longest FU (15.5 y) survival rate relating to acetabular component revision was 98.4% for both populations. DISCUSSION These results are in the same agreement than those of the literature for a category of high demanding performance patients for their implants . We didn't observe increase rate of wear in the 2 groups. CONCLUSION DMC for young patients is a relevant surgical option. We now think that almost all patient eligible for THA, could take significant benefits. It is justified

Abstract no.: 46264 TIPS AND TRICKS IN HIP REVISION SURGERY

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Introduction: The removal of a well fixed broken femoral component could be an extremly demanding, time consuming and potentially damaging to the host bone. Different methods have been described to extract broken femoral stem yet this remains one of the most challenging procedure to the surgeon. Patients and method: The authors present three cases underwent a simple, minimally invasive procedure, using a 6-8 mm common orthopaedic drill, a 4 mm carbid drill and a curved Steimann pin for removal of the the broken cemented femoral stem in revision total hip arthroplasty. The method is simply to drill the anterior surface of the femur just above the proximal third of the broken stem first with the greater drill going through the anterior cortex and the cement mantel in 45 degrees angle, followed by the 4 mm carbid drill into the metal almost perpendicular. After the appropriate holes have been prepared the broken stem could be loosened by using a little bit curved Steimann pin and an orthopaedic mallet followed by an easy extraction from proximal. Discussion: Our method offers a simply and controlled method in extracting a well fixed, fractured cemented femoral stem. Additional advantage of this method, than long revision femoral component is seldomly needed and in most of the cases the "cement in cement" technique could be performed easily. We hardly believe this technique is able to improve the list of similar methods so far and defenitely less invasive procedures to the others.

Abstract no.: 48484 A NEW TRIAGE AND TRANSPORT PRIORIZATION DEVICE FOR MASS CASUALTY INCIDENTS AT SEA

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Background: The number of passengers travelling with ferries and cruise ships worldwide has increased tremendously in recent years. Meanwhile terrorist attacks have become more probable. Mass casualty incidents (MCI) at sea overwhelm local emergency resources in this scarce environment demanding a structured emergency plan. In this extreme situation patient triage is required to prioritize patient treatment and transportation to medical facilities. It may be difficult for non-medical personnel. We therefore aimed to develop a computer-based triage and transport prioritization tool for non-medical personnel. Materials and methods: Based on existing triage algorithms and expert consensus a tablet-software for MCI scenarios was developed. Preceding experiments evaluated the systems' technical performance and stability. In order to further investigate the application for operations at sea a performance model was developed to compare triage results between surgeons and non-medicals. Surgeons and non-medical personnel were asked to prioritize patient groups with varying information and patient numbers. Kendall's Concordance-coefficient was calculated using SPSS software. Results: Among surgeons a high concordance was found when triaging a small number of patients and reduced information. Consent was lower in a scenario with many patients and much clinical information. Evaluation of concordance between surgeons versus softwarealgorithm revealed good overall performance Conclusion: Software supported triage is a useful tool for non-medical personnel especially in MCI with a high number of patients. Tablet based triage may increase coordinative efficiency in transport priorization. Further research should evaluate triage performance at sea.

Abstract no.: 46631 PRIMARY DEFINITIVE INTERNAL FIXATION OF GUSTILO IIIA AND IIIB FRACTURES

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Open fractures are surgical emergency but the initial definitive management of Gustilo III injuries is still controversial. The current trend is debridement, temporary primary stabilization initially and definitive fixation of the fracture later on whenever required once the wound is under control. We treated 107 patients with Gustilo III open fractures, 58 fractures with Gustilo IIIA and 59 fractures with Gustilo IIIB wounds. Patients were between 3 years to 79 years old. Follow up period was between 3months to 3 years and definitive treatment was done within 12 hours of injury. The overall results were good in terms of infection, morbidity, time and cost of treatment and patient satisfaction. There were five low grade infections which required early implant removal. Thorough debridement and primary definitive fixation of Gustilo IIIA and Gustilo IIIB fractures have good outcome in terms of early return to pre injury status, morbidity (which is less) and cost effectiveness.

Abstract no.: 47381 A CLINICO-RADIOLOGICAL STUDY OF OPERATIVE TREATMENT OF TIBIAL PLATEAU FRACTURES

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Fractures of the proximal tibia often described as "bumper fractures" represents 1% to 2% of all fractures but, account for approximately 8% of fractures occurring in elderly. Objectives: To manage the tibial plateau fracture with operative intervention and to evaluate the results in terms of functional improvement and radiological outcome. Methods: This is a prospective study of 96 patients with tibial plateau fracture and followed up for an average period of 6.5 years. The assessment of results and Statistical Analysis was based on Rasmussen's functional and radiological grading system. Results: Type II was the most common type occurring in 31.25% cases. Intra-articular soft-tissue injuries were associated in 28.13% patients, Lateral meniscus tear being most common followed by anterior cruciate ligament injury. Post-operative depression was within 0-4 mm in 90.63% patients (average1.5mm). According to Rasmussen's functional grading, 53.13% patients had excellent and 34.38% patients had good functional results. The mean Rasmussen's functional score was 25.78. According to Rasmussen's radiological grading, 25% patients had excellent results and 71.88% patients had good radiological results. Only 3.13% patients had fair radiological results. The mean Rasmussen's radiological score was14.88. Conclusion: Anatomic reduction with internal fixation along with early knee mobilization and aggressive physiotherapy is essential for the better functional outcome. These fractures should be operated at the earliest, but in high-energy trauma with soft tissue compromise, as in Schatzker's type V and type VI, the definitive procedure should be delayed for about a week with skeletal traction or external fixator, till soft tissue improves

Abstract no.: 48794 TRADITIONAL BONE SETTING COMPLICATIONS IN A TROPICAL COUNTRY

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Traditional bone setting of limb fractures is common in sub-Saharan Africa. It is a provider of complications, sometimes serious. We have studied their epidemiological and clinical aspects. This prospective analytical study covers the period from January 2011 to June 2016. It included patients with a complication following a traditional treatment of fractures in the Department of General Surgery of the hospital. Sociodemographic and clinical variables were studied. Sixty-five cases were retained, accounting for 7.8% of trauma cases. They were predominantly male (81.5%) with an average age of 33.5 years (6-70 years). All the social strata were concerned. Twenty patients (30.8%) had a monthly income below the guaranteed interprofessional minimum wage, and 31 (47.7%) had a primary school level. The combination of massage, incantation and laying of wooden splints was the traditional method most used. The average time for consultation was 139.7 days. The most common complications were pseudarthrosis (40.0%) and vicious callus (29.2%). The complication type was statistically related to the consultation period (p = 0.01). The management of the complications was surgical. Postoperative complications (mainly suppurations) were encountered in 18.5% of cases. At mean follow-up of 41.7 months, functional outcomes were good, moderate and poor in 81.2%, 6.3% and 12.5%, respectively. They were statistically related to the time of consultation and type of complications (p-values of 0.008 and 0.0001). The complications of traditional limb fracture treatment are frequent and severe. A better accessibility to modern orthopedicstraumatology could limit this tragedy.

Abstract no.: 48505

EXTREMITY **KINEMATICS** AND **TEMPOROSPATIAL** UPPER PARAMETERS OF FILIPINO TRACK AND FIELD PARALYMPIANS WHEELCHAIR PROPULSION: AN DURING ANALYSIS USING Α **KINECT®-BASED MARKERLESS MOTION ANALYSIS SYSTEM** Carlo Emmanuel SUMPAICO¹, Christoher CONSTANTINO², Joycie ABIERA³ ¹Department of Orthopedics Motion Analysis Program, University of the Philippines - Manila, Philippine General Hospital, Quezon City (PHILIPPINES), ²Department of Rehabilitation Medicine, University of the Philippines - Manila, Philippine General Hospital, Mania (PHILIPPINES), ³Department of Rehabilitation Medicine. University of the Philippines - Manila. Philippine General Hospital, Manila (PHILIPPINES)

Background: Motion analysis systems are used to determine parameters during wheelchair propulsion (WCP). Objective: The potential of a novel Kinect®-based marker-less motion analysis system as a tool for rehabilitation and training was determined. Methodology: Twenty (20) adult male track and field Paralympians, (mean age = 36 ± 8.47) propelled themselves on a wheelchair ergometer system while their upper extremity motion was being recorded by two Kinect® cameras connected to two personal computers and then processed by Mathworks MATLAB and Open Sim software. Results: The temporospatial parameters, joint kinematics, and hand trajectory patterns during the propulsion and recovery phase of each participants' WCP cycle were determined and averaged. Average cycle time was 1.45s ±0.19, average cadence was 0.70 cycles/s ±0.09, and average speed was 0.76m/s ±0.32. Average shoulder flexion was 30.99° ±28.38, average elbow flexion was 24.23° ±12.25, and average wrist flexion was 12.82° ±26.78. Eighty five percent (85%) of the participants used a semicircular hand trajectory pattern. Conclusion: The system has the potential to obtain measurable values during independent wheelchair propulsion.

Abstract no.: 48211 THE CHALLENGES FOR THE YOUNG ORTHOPEDIC SURGEON IN THE REDUCTION AND SYNTHESIS OF ARTICULAR KNEE, ELBOW AND ACETABULAR FRACTURES. ARE THE 3D MODELS REALLY USEFUL? Luigi MECCARIELLO¹, Giuseppe ROLLO², Massimo TORSELLO³, Giorgio DE NUNZIO⁴, Luigi MARTELLA³, Marina DONATIVI⁴, Marco FILIPPONI², Paolo PICHIERRI²

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Introduction: The anatomical reduction and synthesis of articular fractures is a challenge for the orthopedic surgeon. The management of this type of fracture very often requires a high learning curve. Methods: The purpose of our study is to compare surgeons, experienced in the synthesis of such lesions, with inexperienced surgeons trained on three-dimensional models reproducing these fractures. Methods: We created through a 3D printer, after running CT and DEXA, bone fracture patterns in patients with displaced and multiple fragment fractures of the acetabulum, knee and elbow for a number of 12 models. We compared the experienced surgeons with the inexperienced ones, by calculating the time required for the preoperative planning, the accuracy of reduction and synthesis and the ability of the inexperienced surgeons to actively participate in the operations on patients. The assessment criteria of excellence indicated for statistics were: the correct arrangement of the dynamics of the event, the radiological picture description, the TLISS Score and the correlation between the therapy and literature reports. The statistical methods used were: the statistical significance, the reliability, the validity of the decision, the percentage of accuracy and the Cohen K. Results: The results showed an acceleration of the growth curve of the surgeons not experienced in the fracture reduction of the acetabulum, knee and elbow but, in this group, we also noticed a greater difficulty in dealing with the tissue sparing. Conclusion: In conclusion we may confirm that the 3D reproduction of articular fractures can help the young surgeon to grow.

Abstract no.: 46452 ASSESSMENT OF BONE HEALING DURING ANTEGRADE INTRAMEDULLARY ROD FEMUR LENGTHENING USING RADIOGRAPHIC PIXEL DENSITY

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Femur lengthening using intramedullary (IM) rods represents an extraordinary innovation, but patients must restrict their weight bearing until sufficient bone healing is observed at the regenerate site. The authors of the present study investigated bone regenerate pixel density on a picture archiving and communication systems (PACS) monitor after antegrade femur lengthening using IM rods. METHODS: Thirty-two consecutive patients who underwent antegrade femur lengthening using an IM rod at a minimum of 1-year follow up were included in this study. The pixel density of the lateral, medial, anterior, and posterior cortices was measured in each patient at every postoperative visit. The pixel density ratio (PDR) was calculated, and subsequently correlated to the subjective assessment of bone healing by one of the senior authors. RESULTS: Bone regenerate healing was clinically declared by the treating surgeon at mean 8.5 weeks (range, 4 to 18 weeks). The mean PDR at bone healing was 0.83 at the lateral cortex, 0.88 at the medial cortex, 0.91 at the anterior cortex, and 0.97 at the posterior cortex. The overall PDR corresponding to bone healing was 0.90, which was significantly (p<0.001) greater than the value at the previous clinic visit (0.82), when the bone was not yet clinically declared healed. The PDR at bone healing did not correlate with patient gender, age, laterality, or distraction length. CONCLUSIONS: The findings of the present study introduce the PDR as an objective measurement that can be used to monitor bone healing and establish a threshold value for bone union.

Abstract no.: 46614 EVALUATION OF A NEW IGS FOR THE IMPLANTATION OF PROXIMAL FEMORAL NAILS – A RANDOMIZED CONTROLLED TRIAL

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Intertrochanteric fractures are a common injury and implantation of a proximal femoral nail e.g. the gamma nail (Stryker) are widely used. To be effective, the precise placement of the lag screw is crucial as the calculated TipApexDistance (TAD) should not exceed 25mm. Commonly, the implant is placed by fluoroscopic guidance. This study aims at determining whether the use of a navigation system (Stryker ADAPT) that analyses 3D implant position on the fluoro image by the help of a radiodense clip on the aiming device provides help in aiming for the optimal lag screw position. We included patients presenting with intertrochanteric fractures type AO 31A1 and 31A2 if exclusion criteria were not present. Participants were randomized into two groups, navigated (n=18) vs. control group (n=13). Main outcome criteria was TAD, secondary outcome parameters were operation time, number of fluoroscopic images and drilling attempts of the lag screw's guide wire. Results showed a significant lower TAD (median 18,01 mm vs. 26,25 mm; p=0,008) in the navigation group and significant less drilling attempts (median 1 vs. 4 attempts; p=0,001) with a not significant longer operation time (median 34 min vs. 27 min; p=1) and with a similar number of fluoroscopic images (median 71 vs. 71; p=1). Unlike common navigation systems the ADAPT does rarely need user interaction. After the current results the ADAPT seems to offer additional precision without additional radiation exposure or significant additional operation-time.

Abstract no.: 46500 PERCUTANEOUS EXCISION OF DIFFICULT OSTEOID OSTEOMAS USING INTRA-OPERATIVE CT NAVIGATION – AN EARLY EXPERIENCE Bhaskara Kanakeshwar RAJA¹, Venkatadass KRISHNAMOORTHY², Rajasekaran SHANMUGANATHAN¹ ¹Ganga Medical Centre, Coimbatore (INDIA), ²Ganga medical Centre, Coimbatore (INDIA)

Introduction: Osteoid osteomas are notorious for intraoperative technical difficulties regarding localization and adequate excision especially when they are not clearly visualized on plain radiographs or when they occur in difficult and inaccessible regions. Localisation in the radiology suite and shifting them to the operating room can be cumbersome and can result in errors due to lack of real-time imaging. In these scenarios, intra-operative navigation will be useful. We report a technique of intra-operative CT navigation for localization and excision of osteoid osteomas occurring in long bones. Materials & Methods: Six patients (4 femoral and 2 tibial lesions) with a radiological diagnosis of osteoid osteoma, in whom the nidus could not be visualized on plain radiographs were treated with this technique. Intra-operative CT navigation with AIRO (Brainlab) was done and the images were registered on the computer. The lesion was then localized and excised with the help of a high-speed burr. All of them had on-table CT scans post excision, which showed complete excision of the nidus. All of them were symptom free and doing well functionally at a minimum follow-up of 6 months. Conclusion: Intra-operative CT navigation helps to exactly localize the nidus and also helps in confirmation of complete excision of the nidus. This is a safe, effective and minimally invasive method to treat difficult osteoid osteomas, particularly those which are not amenable for excision under C arm guidance.

Abstract no.: 46923 IMPACT OF ISOCENTRIC NAVIGATION ON RADIATION EXPOSURE IN TRANSFORAMINAL PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY

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Introduction: Optimal placement of working channel is required in transforaminal percutaneous endoscopic lumbar discectomy (tPELD), which depends on the accurate percutaneous punctures. The conventional blinded punctures heavily rely on repeated fluoroscopy, which resulted in massive radiation exposure and longer operation time. The study aimed to investigate the impact of isocentric navigation on radiation exposure and radiation-related disease in tPELD. Method: The study prospectively assessed 127 patients receiving L4/5 or L5S1 tPELD from October 2015 to August 2016. Patients receiving the isocentric navigation were regarded as Group A, and those undergoing conventional methods were considered as group B. Result: The average puncture times was 1.59±0.66 in Group A and 4.83±1.76 in Group B (P<0.001). The total fluoroscopic times were 27.38±5.11 in Group A and 36.97±7.52 in Group B (P<0.001). The total exposure time was 26.27±4.75s in Group A and 33.51±7.08s in Group B (P<0.001). The estimated radiation dose was 0.49±0.09mSv in Group A and 0.63±0.14mSv in Group B (P<0.001). The estimated risk of cancer was (26.75±4.89)*10-9 in Group A and (34.39±7.50)*10-9 in Group B (P<0.001). The estimated risk of genetic diseases was (0.97±0.18)*10-9 in Group A and (1.25±0.27)*10-9 in Group B (P<0.001). The operation time was 62.91±10.03min in Group A and 69.84±10.49min in Group B (P<0.001).There were no significant difference in satisfaction and complication between two groups (P>0.05). Conclusion: Isocentric navigation significantly improves the puncture accuracy of tPELD and decreases the operation time as well as radiation

Abstract no.: 47707 THE LEARNING CURVE ASSOCIATED WITH THE CT PLANNED, ROBOTIC-GUIDED UNICOMPARTMENTAL KNEE ARTHROPLASTY.

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The Mako robotic system uses preoperative computerised tomography (CT) and intraoperative dynamic referencing to guide bone resection and implant positioning. Understanding the learning curve for Mako robotic-guided surgery is important for patient safety, optimising surgical outcomes, and reducing complications. The objective of this prospective study was to establish the learning curve associated with introducing CT planned, robotic-guided unicompartmental knee arthroplasty (UKA). Thirty-two consecutive Mako robotic-guided medial UKAs were performed by a single-surgeon with extensive experience in conventional-jig-based Oxford UKA and cadaveric training on robotic UKA. Learning curve outcomes were reviewed in blocks of 5 patients in order to prevent bias from difficult anatomy or individual case technical difficulties. The study found that the learning curve for surgeon and scrub team comfort was 5 cases. The key learning was from adapting to change in assistants, and tactile feedback from the robotic controlled milling burr. The pressure exerted by the surgeon's hand on the burr and operating time decreased after 5 cases. Registration or setting up was not associated with any learning curve with the surgeon getting comfortable by the third case. There was no learning curve for implant sizing or alignment and no intraoperative complications. This study showed that CT planned, robotic assisted UKA is associated with a learning curve of 5 cases for surgeon and scrub team comfort, and operating time. Adjustments to tactile feedback of the burr and use of assistants were the key learning aspects for the surgeon. There was no learning curve for implant positioning and alignment.

Abstract no.: 48774 DOES EXTENDED TRAINING ON A VIRTUAL-REALITY DYNAMIC HIP SCREW SIMULATOR IMPROVE PERFORMANCE?

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Background: The popularity of Virtual-Reality (VR) simulation has steadily increased as it offers a safe and economical learning environment. Previous work has shown that a training effect is present after two weeks of training on dynamic hip screw (DHS) simulators. Aims: To assess whether extended training beyond a two week period confers any advantage to improve performance on a VR DHS simulator. Methods: 11 medical students were voluntarily recruited to train on a VR DHS simulator. Students were allowed 45 minutes of training and returned for an additional 45 minutes after a one-week washout period (standard training). The group returned for a third 45 minutes of training one week later, (extended training).Results: No improvement was seen between week two and week three in time taken (95.6s vs. 103.9s, p=0.101), fluoroscopy used (14.8s vs. 18.4s, p=0.435) and number of radiographs taken (16.0 vs. 15.0, p=0.078). However, extended training displayed an improvement in the tip-apex distance (9.5mm vs. 13.6mm, p=0.010) and global score (95.1% vs. 78.7%, p=0.0394). Conclusions: Extended training improves performance of trainees in performing VR DHS procedures. Educators should consider using a three week training curriculum to fully develop psychomotor operative skills.

Abstract no.: 47149 CONVENTIONAL PLATE FIXATION METHOD VERSUS PREOPERATIVE SIMULATION VIRTUAL AND THREE-DIMENSIONAL **PRINTING-**CONTOURED ASSISTED PLATE FIXATION METHOD IN THE TREATMENT OF ANTERIOR PELVIC RING FRACTURE: A PRELIMINARY REPORT

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We retrospectively reviewed 21 patients with pelvic fracture treated by anterior pelvic fixation with plate. There were two groups of patients. Conventional plate fixation method (Conventional method, n=11), and preoperative virtual simulation and three-dimensional (3D) printing-assisted contoured plate fixation method (Simulation method, n=10). Two groups were operated by the same surgeon at our hospital between 2014 and 2017. All patients were taken CT scan of pelvis at ER for evaluation of fracture pattern. Different from Convention method where the plate was contoured during the operation, in Simulation method we collected DICOM files from CT software and imported to Mimics Research 19 by Materizlise, the software for pre-operative simulation. The simulation includes sampling, segmentation, 3D image reconstruction, and virtual reduction. Next, we exported the image to ".stl" file and printed the patient-specific pelvis model using desktop 3D printer. After the above steps, we planned the length and position of plates implantation on the model and pre-contour the curvature of plates anatomically before surgery. Data collected included operation time, instrumentation time, blood loss and postoperative radiographic measurement, and complication. Statistical analysis was performed to evaluate significant difference between two groups with regard to each of these variables. Instrumentation time was significantly shorter in patients receiving the virtual simulation and 3D printing-assisted contoured plates than that with conventional plate fixation method. This preliminary study shows that preoperatively contoured plate by individual 3D printing model technique significantly decreases instrumentation time during surgery.

Abstract no.: 47804 SECONDARY PATELLAR RESURFACING FOR PERSISTENT ANTERIOR KNEE PAIN (AKP) AFTER PRIMARY KNEE ARTHROPLASTY Ori WEISS MEIR, Ganey Tikva (ISRAEL)

PREFACE: The dilemma whether to resurface the patella during TKA is still controversial. Routine patellar resurfacing during the procedure continues to be debated on. The goal of our study was to analyze the results of SPR procedures indicated by patellofemoral syndrome, and find common denominators to predict those patients prone for AKP. PATIENTS & METHODS: Between January 2000 and January 2012, 1,776 primary TKA procedures were performed in our institute. We retrospectively evaluated the clinical records of 33 patients subjected to a SPR. Based on the modified Ranawat scale, patients were asked to assess their satisfaction from the procedure & AKS scoring. Radiographically, We have checked & measured the joint line, insall-salvati ratio, lateral patellar tilt, congruence angle and patellar thickness. RESULTS: All 25 patients from the satisfied and the partially satisfied groups showed overall improvement of both components of the AKS score after SPR. We have found excellent correlation between the subjective patient reports post operatively - to both clinical & functional changes. range of motion - None of the patients showed a decrease in their post op range of motion. The mean improvement was 11.6° degrees. Additionally, we have found that there is preference to older age & correlation to BMI. CONCLUSIONS: Patellar resurfacing was the final procedure in the majority of patients. After comprehensive investigation & analysis of clinical, radiological & Demographic data, based on our results-patellar resurfacing is a viable option for resolving knee pain after TKR.

Abstract no.: 46175 VARUS KNEE TOTAL REPLACEMENT SURGERY (TIBIAL COMPONENT PLACEMENT) ACCORDING TO THE ROTATIONAL ALIGNMENT OF THE LIMB

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Normal femorotibial rotational index (FTI) (tibial torsion minus femoral anteversion) ranges between 10° and 20° of external rotation. Normal femoral anteversion (FA) is 15° (range, 0° - 30°) and tibial external torsion (TET) is 25° (range, 10° - 40°). The TET should be a reflection of the FA. The purpose of this study was to evaluate the effect of the correction of the excessive TET during the TKR surgery. 50 patients with varus deformity underwent before the TKR surgery the whole limb weight-bearing radiograph mechanical axis measurement and the computed tomography scanning for rotational alignment analysis. In cases with the increased TET (not compensated by the increased FA) the tibial component was adequately externally rotated to compensate rotational malalignment. The femoral component was routinely implanted according to the transepicondylar axis using the computer navigation system. The patella was not resurfaced in any case. The mean follow-up was 16 months (at least 12 months). The TET was higher than 40° in 7 cases and lower than 10° in no case. The high TET (≥ 35°) not compensated by the FA (the FTI \geq 30°) was found in 11 cases (22 %). In these patients the tibial component was externally rotated by 20° (corresponding to the 10 mm rotational shift) to correct the foot progression angle and so eliminate corrective internally rotating active muscle forces resulting in greater contact pressure in the medial PF compartment. In these 11 patients, no anterior knee pain was found during last follow-up clinical examinations.

Abstract no.: 48389 CHANGE OF CHONDRAL LESIONS AND PREDICTIVE FACTORS AFTER MEDIAL OPEN-WEDGE HIGH TIBIAL OSTEOTOMY WITH A LOCKED PLATE SYSTEM

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Background: Although cartilage regeneration after medial open-wedge high tibial osteotomy (HTO) has been described, there is a paucity of reports regarding which factors influence cartilage regeneration. Objective: To document whether cartilage regeneration occurs in the previously degenerated medial compartment of arthritic knees after medial open-wedge HTO and to assess which predictive factors influence regeneration after HTO. Materials and Methods: 104 consecutive knees were enrolled that received medial openwedge HTO without any additional cartilage regeneration procedures and that were followed by second-look arthroscopy 2 years after surgery. The mean age at the time of index HTO was 56.3 years. Results: Per the International Cartilage Repair Society grading system, the lesions in the medial femoral condyle and the medial tibial plateau were improved in 54 knees (51.9%) and 36 knees (34.6%), respectively, at the time of secondlook arthroscopy. According to the macroscopic grading system of Koshino et al., partial and total regeneration of articular cartilage in the medial femoral condyle and the medial tibial plateau was observed in 75 knees (72%) and 57 knees (55%), respectively. Multiple logistic regression analysis for regeneration of articular cartilage showed lower BMI (P =.015) for the medial femoral condyle to be a significant predictor. Conclusion: Regeneration of degenerated articular cartilage in the medial compartment can be expected while correcting a varus deformity in arthritic knees after medial open-wedge HTO. Medial open-wedge HTO in the medial arthritic knee with varus malalignment should be highly successful in terms of cartilage regeneration, especially for lower BMI patients.

Abstract no.: 46587 INSIDE-OUT STEPLADDER PITHING TECHNIQUE FOR BALANCING THE MEDIAL COLLATERAL LIGAMENT IN TOTAL KNEE ARTHROPLASTY Mrinal SHARMA

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A knee which is not balanced properly will have abnormal kinematics and would eventually fail. We describe a 'Inside-out Stepladder pithing technique' using 18 gauge hypodermic needle for accurate MCL release to balance a varus deformity. One hundred one knees were included in the prospective study on 65 patients who underwent TKA were balanced using the Stepladder inside-out pithing technique for MCL release between june 2011 and june 2013. 57 (87.70%) were females and 8 (12.30%) were males. The mean age of patients was 63.58+ 9.11 (range 44-74 years). All patients with varus gonarthrosis with deformity of any degree, with or without flexion contracture of any degree were included. An 18 gauge needle was used for pithing the most tight part of the MCL was palpated in a stepladder fashion, keeping a minimum distance of approximately 2-3mm between pithing points, at the level of joint line from inside out keeping the bevelled end of the 18 gauge needle in a horizontal direction. A maximum of 5 pithings were done at one time. The mean duration of follow-up was 3.3 years (2.1-4 years). The average number of pithings to produce a balanced joint gap was 8.61+-3.79(range 2-15) (table 1) .KSS improved from 25.93±15.31 (mean ± SD) to 94.17±4.34 (mean ± SD) postoperatively. The functional scores improved from 21.24 ± 11.23 pre-operatively to 94.65 ± 6.41. The Inside-out stepladder pithing technique of MCL is a safe, simple and easily reproducible method to accurately correct varus deformity in TKR.

Abstract no.: 46960 LOW DOSE OF EPINEPHRINE AND TRANEXAMIC ACID REDUCES EARLY POST-OPERATIVE BLOOD LOSS AND INFLAMMATORY RESPONSE IN TOTAL KNEE ARTHROPLASTY: A RANDOMIZED CLINICAL TRIAL

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Background: This RCT was designed to evaluate whether combined administration of low dose of epinephrine (LDEPI) plus tranexamic acid (TXA) would reduce perioperative blood loss or inflammatory response even further compared with TXA alone. Methods: 179 consecutive patients who underwent primary TKA were randomized into three interventions: Group IV received intravenous (IV) LDEPI plus TXA, Group TP received topical (TP) diluted-epinephrine (DEPI) plus TXA and Group CT received TXA alone. The primary outcomes included perioperative blood loss, coagulation and fibrinolvsis parameters, inflammatory cytokines levels and transfusion values (rate and volume). Secondary outcomes included thromboembolic complications, length of hospital stay, wound score, range of motion (ROM) and hospital for special surgery (HSS) score. Results: The calculated total blood loss in Group IV was 348.1 ± 158.2 and 458.0 ± 183.4 mL on post-operative day 1 and 3, were significantly reduced (p < 0.05) compared with that in Group TP (420.5 ± 188.4 and 531.1 ± 231.7 mL) and Group CT (520.4 ± 228.4 and 633.7 ± 237.3 mL). IV LDEPI had a net anti-inflammatory activity in TKA, and didn't induce hypercoagulable status obviously. Transfusion values were significant reduced in Group IV, no statistical differences were observed with regard to the incidence of thromboembolic complications, wound score, ROM and HSS score among the 3 groups. Conclusion: Combined administration of LDEPI and TXA demonstrated significantly increased effect in reducing perioperative blood loss and inflammatory response when compared with TXA alone, and seemingly no increased incidence of thromboembolic and other complications

Abstract no.: 48738 FACTORS AFFECTING SATISFACTION FOLLOWING TOTAL KNEE REPLACEMENT: A SYSTEMATIC REVIEW OF OVER 130,000 CASES Naoki NAKANO, Fernando OLAVARRIA, Vikas KHANDUJA Department of Trauma and Orthopaedics, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust, Cambridge (UNITED KINGDOM)

Introduction: Although outcomes of total knee replacement (TKR) are traditionally assessed by survival analysis with revision as an endpoint, it has emerged that patient satisfaction is a true and important representation of the experience of TKR. The aim of this systematic review was to determine the factors affecting patient satisfaction following TKR by searching all the literature ever published. Methods: In accordance with the PRISMA guidelines, two reviewers searched the online database (PubMed (Medline), EMBASE, Google Scholar, BNI, CINAHL and AMED) for literature describing factors affecting patient satisfaction following TKR. The research question and individual study eligibility criteria were established a priori. Clinical outcome studies and both prospective and retrospective case series that described factors affecting overall satisfaction following primary TKR were included. Results: The systematic review finally found 173 relevant papers which met the inclusion criteria and this involved 130,051 TKRs. 69 items were found as potential factors, and 44 factors among them were determined to have a relation to patient satisfaction following TKR. Especially, 5 preoperative factors (female gender, obesity, low back pain, mental problem and mild degree of osteoarthritis (OA)), 2 intraoperative factors (fixed-type bearing and non-resurfaced patella) and 3 postoperative factors (pain, poor range of motion and expectation not met) negatively associated with satisfaction significantly. Conclusions: Surgeons should take these factors into consideration when they plan to conduct TKR, and patients also should be informed of them preoperatively to have a reasonable expectation for TKR.

Abstract no.: 47913 DOES PRE-OPERATIVE ETIOLOGY PLAY A ROLE IN QUALITY OF LIFE AFTER REVISION TKR? A COMPREHENSIVE ANALYSIS USING 5 SCORING SYSTEMS

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Purpose: To assess the effect of etiology (septic vs aseptic) on the functional outcome and quality of life after revision TKR. Materials and Methods: We retrospectively reviewed 45 cases of revision knee arthroplasty in 41 patients with an average follow up of 4 years. The patients were assessed using 5 scoring systems i.e. Knee Society Score, Hospital for Special Surgery score, Oxford Knee Score, Western Ontario and McMaster Universities score and the Short Form - 36 Health Survey score. Results: The HSS score, Knee Society Scores and the Oxford knee score showed no significant differences between the two groups. However, the WOMAC score showed a statistically significant difference with a better outcome in the septic group. The SF-36 score sub-group showed a significant difference in the RE component (role limitations due to emotional problems) with the results being poorer in the septic group. Conclusion: Our study brings to the fore the importance of not just surgical management of patients with septic failure but also the importance of paying heed to the emotional and social problems encountered by these patients which has an impact on their outcome as a whole and diminishes their perception of overall benefit obtained from revision surgery inspite of equivocal knee scores as compared to their counter-parts.

Abstract no.: 47783 SINGLE DOSE INTRAVENOUS TRANEXAMIC ACID MAY NOT BE ADEQUATE TO REDUCE BLOOD LOSS AND BLOOD TRANSFUSION REQUIREMENT IN PATIENTS UNDERGOING SINGLE STAGE BILATERAL TOTAL KNEE ARTHROPLASTY Sujit Kumar TRIPATHY, Somnath MUKHERJEE AIIMS, Bhubaneswar, Bhubaneswar (INDIA)

Background: Simultaneous bilateral total knee arthroplasty (TKA) causes increased blood loss and increases the risk of venous thromboembolism. Tranexamic acid (TXA) is commonly used to minimize blood loss and transfusion requirements. However, the optimal regimen of TXA in single stage bilateral TKA is still not defined. Methods: In this retrospective study, 35 patients who received TXA and 31 patients who did not receive TXA were evaluated for blood loss and transfusion requirement. Results: Both the groups were comparable in terms of age, sex, body mass index and preoperative haemoglobin (Hb) and haematocrit (Hct). There was no significant difference in the change in Hb levels $(2.42 \pm 1.28 \text{ vs } 2.44 \pm 1.31; p=0.95)$ and Hct $(1.37 \pm 0.96 \text{ vs } 1.62 \pm 0.98, p=0.22)$ between the groups. There were no significant differences between the study and control groups in the intraoperative blood loss (163.71 vs 165.32 ml, p=0.92), drain output (621.71 vs 695.65 ml, p=0.65) and total blood loss (785.0 vs 860.97, p=0.40). There was no significant difference in allogeneic blood transfusion between the groups (62.85% received blood in the study group vs 58.06% in the control group, p>0.05). Conclusion: Single intraoperative dose of TXA is not effective in reducing blood loss and transfusion requirement in bilateral TKA.

Abstract no.: 48445

NAVIGATION SYSTEM HAVE ANY **ADVANTAGES** DOES IN UNICOMPARTMENTAL KNEE ARTHROPLASTY COMPARED WITH **CONVENTIONAL TECHNIQUE IN LONG-TERM RESULTS?** Dong-Hyun LEE¹, Eun Kyoo SONG¹, Jong Keun SEON², Je Hyoung YEO² ¹Center for Joint Disease at Chonnam National University Hwasun Hospital, Hwasun-Eup, Hwasun-Gun, Jeonnam (SOUTH KOREA), ²Center for Joint Disease at Chonnam National University Hwasun Hospital, Hwasun (SOUTH KOREA)

Introduction: Minimally invasive UKA technique often poses difficulties in identification of landmarks for component positioning;and intraoperative navigation has been demonstrated to improve the radiological results. However, it's not clear whether this will have any effect on long-term clinical outcomes.Methods:Between January 2003 and December 2005,68UKA performed using either navigation technique(n=34patients)or conventional technique(n=34 patients)were included.Imageless navigation system was used in the navigation group. The clinical results were evaluated in terms of ROM, HSS and WOMAC score.On weight-bearing radiographs, the radiological results were evaluated in terms of Hip-Knee-Ankle(HKA) angle, and coronal and sagittal positioning of both components.Outliers were defined as any difference more than 30 from the optimum.Mechanical alignment was also evaluated using the Kennedy zones.Results:At an average follow-up of 10.5 years, all clinical parameters significantly improved in both groups. The ROM was similar in both groups. Average HSS and WOMAC score were better in the navigation group, but no statistical significances (p>0.05). Overall HKA angle and limb alignment were similar but the number of outliers was more in the conventional group. The coronal alignments of both components were significantly better in the navigation group with less number of outliers. More patients in the navigation group had their mechanical axis lying in the central Kennedy zone. The overall 10-year survival was better in the compared navigation group(97.1%) conventional as to group(94.0%)(p=0.09).Conclusions:The use of intraoperative navigation in UKA helps to achieve more accurate implant positioning and desired mechanical axis, with reduction in the numbers of outliers. There was weak evidence that these improved alignment definitely translates into a significant improvement in long-term clinical results, reduced revision rates and increased long-term survival of UKA

Abstract no.: 47919 SHOULD WE REPLACE THE PCL IN TKR

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Multiple differing design philosophies for TKR have come & gone over the past several decades .However, deliberation over whether to retain or sacrifice the PCL in TKR continues.Banks et al found that a group of TKR's with intact PCL had normal axial rotation & condylar translation whereas those with a post-cam substitution & no PCL had the smallest in vivo rotation & translation. In native knee, lateral condyle has a significantly increased radius of curvature when compared with the medial condyle. Specific design features in the CR TKR (asymmetric radius of curvature of femoral condyles) appear to be responsible for normal kinematic patterns observed. This rollback can only occur if in addition to appropriate condular geometry, there is appropriate tension on PCL as well as no inhibition of this motion by interaction of tibial articular surface. Although prosthesis design is clearly important for success with CR, it must be combined with appropriate surgical technique to meet goals of PCL retention. PCL resists posterior subluxation forces & serves as a 2 degree stabiliser against varus valgus instability.PCL maintains femorotibial contact points at centre of polyethylene. Preservation of PCL requires maintenance of joint line, & thus guides correct bony resection. Absorption of deforming forces may be absorbed by PCL, than post-cam mechanism, resulting in less postpolyethylene wear ,Decreased forces transmitted to fixation surfaces.Periprosthetic supracondylar femur fractures that are amenable to fixation, CR TKR allows both retrograde IM nailing & fixed angle plating, plating is only option in PS Additional bone stock is available to obtain strength & stability

Abstract no.: 47817 SINGLE DOSE OF TRANEXAMIC ACID IN TOTAL KNEE REPLACEMENT WITHOUT TOURNIQUET- IS IT CLINICALLY EFFECTIVE IN REDUCING POST-OPERATIVE TRANSFUSION?

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Introduction: TKR done without tourniquet is associated with significant blood loss which often necessitates post-operative transfusion. We aim to evaluate the effectiveness of single dose of Tranexamic acid in reducing the blood loss in TKR without tourniquet. Material and Methods: Patients who underwent TKR under a single surgeon were included in the study. They were divided into 2 groups- Group NT without Tranexamic acid use and Group T with single dose tranexamic acid use at induction. Group NT had 54 patients with average age of 71 years and Group T had 64 patients with average age of 72.4 years. Data collected included post- operative changes in haemoglobin at 24 hours, need for transfusion, number of patients developing DVT/PE and duration of hospital stay. Results: Group NT had average drop in haemoglobin of 45.5 g/dl (17g/dl - 61g/dl) as compared to Group T where it was 23.1g/dl (15g/dl-42g/dl) {P < 0.001}.6 patients (11.1%) in Group NT needed post-operative transfusion with a total of 18 units packed cells transfused as compared to Group T where 3 patients (4.6%) needed post-operative transfusion with a total of 6 units packed cells transfused {P<0.001}. There were 2 patients (3.7%) in Group NT who developed DVT as compared to 1 patient (1.5%) patient in Group T. Average duration of hospital stay was 6.8 and 5.06 days in Group NT and Group T respectively. Conclusion: Single dose of Tranexamic acid in TKR without tourniquet significantly reduces the need for post-operative transfusion without increasing the risk of thromboembolic events.

Abstract no.: 47827 COMBINATION OF **INTRAVENOUS** AND **INTRA-ARTICULAR** TRANEXAMIC ACID REDUCES TRANSFUSION RATE IN SIMULTANEOUS BILATERAL TOTAL KNEE REPLACEMENT SURGERY Mridul ARORA¹, Ashutosh DONGRE², Vijay SHETTY² ¹Hiranandani Orthopaedic Medical Education (HOME), Hissar (INDIA), ²Hiranandani Orthopaedic Medical Education (HOME), Mumbai (INDIA)

Background: Simultaneous bilateral total knee replacement surgeries (SBTKRs) are now considered safe. However, intra-operative blood loss is a matter of concern with this procedure. The use of tranexamic acid (TA) to reduce blood loss in is undoubtedly very popular these days but there is much debate about the timing and appropriate route of administration of TA in SBTKRs. We conducted a prospective study to compare the effect of TA, given intravenously alone or a combination of intravenous and intra-articularly, on blood loss and need for blood transfusion in SBTKRs done without tourniquet. Materials and method: In a prospective comparative study, 30 consecutive patients with end-stage bilateral knee osteoarthritis were subjected to SBTKRs. Group I (IV group; 15 SBTKRs) patients received only intravenous TA on induction and then at closure of the second knee. Group II (IA group; 15 SBTKRs) received one dose of intravenous TA on induction followed by intra-articular TA in both knees upon wound closure. All operations were performed without tourniquet and by a single surgeon. All patients were studied to check a) post-operative haemoglobin drop at 48 hours after surgery and b) requirement of blood transfusion. Results: Our analysis suggested that mean drop in haemoglobin and therefore, mean transfusion rate was significantly low in IA group (p<0.002). Conclusion: Our study indicates that a combination of intravenous TA on induction followed by intraarticular TA may be more beneficial than intravenous dose alone in SBTKRs. Key words: Simultaneous bilateral total knee replacement: Blood loss: Tranexamic acid: Intra-articular
Abstract no.: 47772 COMPARISON OF ADDUCTOR CANAL BLOCK WITH COMBINED ADDUCTOR CANAL BLOCK AND INTRA-ARTICULAR EPIDURAL CATHETER INFILTRATION FOR PAIN RELIEF AFTER TOTAL KNEE ARTHROPLASTY

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Total knee arthroplasty(TKA) can be associated with intense, early post -operative pain. Amongst the various analgesic techniques, adductor canal blockade (ACB) which is a pure sensory blockade not affecting quadriceps strength and intra- articular epidural catheter(IAEC) infiltration can help in superior pain relief and guicker rehabilitation. We did a prospective, non-randomized control trial on 206 consecutive primary, unilateral TKA patients with group 1 comprising of 100 patients receiving ACB (Ropivacaine) plus IAEC infiltration with a 'cocktail' mixture and group B consisting of 106 patients receiving ACB alone. We compared results between two groups using the primary outcome measure as pain measured by VAS scale in post-operative period at 6, 12,18,24 and 48 hours and secondary outcome measures as analgesic requirement at 24 and 48 hours and length of hospital stay. The results demonstrated excellent pain relief in both groups in the first 6 hours and no statistically significant difference in VAS scores between the two groups; however, there was a statistically significant difference in VAS scores between the two groups at 12,24 and 48 hours (p<0.05) with the ACB group demonstrating poorer pain control as compared to the IAEC plus ACB group. There was a statistically significant difference in the length of hospital stay between the two groups with the mean hospital stay of 2.33 days in group 1 and 3.12 days in group 2. Adductor canal blockade with intraarticular epidural catheter infiltration provides a superior and safer option for analgesia after total knee arthroplasty warranting it's wider usage.

Abstract no.: 47912 MANAGEMENT OF TIBIAL BONE DEFECTS IN PRIMARY COMPLEX KNEE REPLACEMENT

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A large number (>150) patients are managed in my centre with various degrees of contained and uncontained bone defects of the tibia in degenerative or inflammatory arthritic conditions. These bone deficiencies, severe arthritis , osteoporosis and ligamant attenuation make this cases complex and intriguing. Various techniques of augmentation of the bone defect with autologous bone graft, metal blocks, screws , reduction osteotomy and offset stems are used to manage these bone defects. The challenge of management of these bone defects is further upped by the presence of severe osteoporosis, matching femoral defects, ligament attenuation and bilateral disease and severe deformity. Decision making and planning surgery these cases using Novel bone grafting techniques of contained defects and usage of various degrees of semi-constrained and constrained implants arranged in before hand are vital for optimal out come of this subset of patients. The aim of the presentation is present the surgical goals of primary complex knee arthroplasty with bone defects and to highlight the importance of meticulous planning and arrangement of back up plan to overcome the surgical difficulties and challenges in these complex cases.

Abstract no.: 46209 HOFFA PAD IN TKR: DISSECTED OR NOT?

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Background: Hoffa pad in Total knee replacement is a mystery. Very few studies have been carried out and no obvious results have been achieved. Aim: Our aim was to compare the clinical value of the Hoffa pad including blood loss, range of motion, anterior knee pain and swelling post total knee replacement. Method: this study has been designed as prospective randomized control trial, with involvement of 4 surgeons, with no exclusion criteria and no special preparation for the patients. Results: By leaving the Hoffa pad well alone, there were increase of range of motion post TKR by 5 to 10 degrees, there were decrease of blood loss by 50%, no difference in swelling, and most patients with Hoffa pad had almost no anterior knee pain. Conclusion: the study is in a very early stage to draw a concrete conclusion, however early results showed that Hoffa pad can play a huge role in lubrication, anterior knee pain and finally in reducing blood loss.

Abstract no.: 48087 RESULTS OF OXFORD MOBILE BEARING MEDIAL UNICOMPARTMENTAL KNEE REPLACEMENT IN INDIAN POPULATION Vijay KUMAR¹, Rajesh MALHOTRA¹, Naman WAHAL¹, Mayur NAYAK¹, Gaurav KANOGIYA¹, Deep SRIVASTAVA¹, David MURRAY², Hemant PANDIT² ¹AIIMS, New Delhi (INDIA), ²NDORMS, Oxford (UNITED KINGDOM)

The Oxford mobile bearing medial Unicompartmental Knee Replacement (UKR) has shown excellent outcome and survival rates for anteromedial osteoarthritis of the knee. However, the suitability of this implant in Indian population has not been reported yet. The short stature, higher incidence of extra-articular tibial bowing and the different sociocultural demands such as squatting in such patients, all make an impact on the patient satisfaction following knee. We present a series of 150 UKR performed at our institute from 2008 to 2015 using minimally invasive technique. 150 UKRs were performed from 2008 to 2015 and were analyzed using Oxford Knee Score (OKS), 2011 Knee Society Knee Scoring System (KSS) which was subdivided into KSS satisfaction. KSS expectation and KSS function score and the Tegner Activity Level Scale (TAS). At the latest follow up, the mean OKS was 39.3, KSS satisfaction score was 32.33, KSS expectation score was 11.41, KSS function score was 70.33 and the TAS was 2.93. The average follow-up of 32 months (range, 12-80 months). There were two cases of aseptic implant loosening and two meniscal bearing dislocation and no infection. The patients had a good functional outcome, were very satisfied and performed better than they had expected at the latest follow up. All the patients could squat at the latest follow-up to meet their specific sociocultural needs.

Abstract no.: 47087 VARUS KNEE OSTEOARTHRITIS: ELEVATED SYNOVIAL CD15 COUNTS INDICATE INFERIOR BIOMECHANICAL PROPERTIES OF LATERAL-COMPARTMENT CARTILAGE

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Introduction(:) Progressive cartilage degeneration is a common failure mode of medial unicompartmental knee arthroplasty. The synovium plays an important role in the pathogenesis of osteoarthritis (OA). Research Question(:) Is there a correlation between immunohistochemical synovial markers of inflammation and biomechanical cartilage properties? Methods(:) The study included 100 knees in 84 patients undergoing primary total knee arthroplasty for varus osteoarthritis (mean age 66 years (range, 49-87 years); mean BMI was 26.0 kg/m2 (range, 17-47 kg/m2)). During surgery, osteochondral samples of the distal lateral femur were harvested for a biomechanical assessment of cartilage. Synovial tissue was taken for a histological and immunohistochemical evaluation of the degree of synovitis. The following immunohistochemical markers tested on all synovial specimens: CD15, Ki-67 and CD68. Two groups were formed, to assess the influence of synovial neutrophilic granulocyte infiltration (CD15) on biomechanical cartilage properties. Results(:) There was a weak negative correlation of CD15 with biomechanical properties of cartilage on the distal lateral femur (aggregate modulus (Ha): rs =-0.125; p=0.257; dynamic modulus (DM): rs =-0.216; p=0.048). No correlations were observed for Ki-67 and CD68. Biomechanical properties were inferior (Ha: p=0.031; DM: p=0.005) in knees with a CD15 of >8 per high power field (HPF) compared to knees with a CD15 of ≤8 /HPF. Conclusion(:) The study suggests that lateral compartment cartilage in patients with elevated synovial CD15 counts markers has a reduced ability to withstand compressive loads. CD15 might be an interesting test to determine the likelihood of progressive degenerative cartilage disease.

Abstract no.: 48388 IS TRANEXAMIC ACID EFFECTIVE IN OPEN-WEDGE HTO?

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Background: There are no studies evaluating the effect of tranexamic acid (TXA) on blood loss associated with high tibial osteotomy (HTO). Objective: To determine the efficacy of TXA with regard to blood loss in the setting of open-wedge HTO, and identify whether patient factors such as age, gender, body mass index, and American Society of Anesthesiologists status affect perioperative blood loss in association with use of TXA Materials and Methods: TXA was used in 75 consecutive cases undergoing open-wedged HTO (TXA group; 17 men and 58 women; mean age, 55.0 years) intravenously. TXA group was compared with the previous consecutive 75 cases without TXA (control group; 14 men and 61 women; mean age, 55.7 years). Results: TXA led to a significant decrease in total blood loss (TXA group, 502.4 mL vs. control group, 882.7 mL; P<0.001) and hemoglobin (Hb) loss (TXA group, 1.8 mg/dL vs. control group, 3.1 mg/dL; P<0.001). TXA significantly decreased drain output (TXA group, 269.3 mL vs. control group, 330.4 mL; P=0.025). There were statistically significant decreases in the time spent in the total length of hospitalization (TXA group, 9.2 days vs. control group, 10.4 days; P=0.019). Multivariate regression showed that gender affected total blood loss significantly in association with the use of TXA (P=0.001). No deep vein thromboses or pulmonary emboli were identified in either group. Conclusion: TXA reduces total blood loss, Hb loss, and postoperative drain output in open-wedge HTO. Patients spent less time in the total length of hospitalization with use of TXA.

Abstract no.: 47908 PATELLOFEMORAL CHONDROMALACIA DOES NOT INFLUENCE THE RADIOLOGIC AND CLINICAL OUTCOMES FOLLOWING HIGH TIBIAL OSTEOTOMY

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This study analyzed the effect of patellofemoral chondromalacia which is observed with arthroscopy but not detected in preoperative plain radiograph on radiologic and clinical results of HTO. We hypothesized that the patellofemoral chondromalacia might not affect the radiologic and clinical results of HTO. 93 patients (101 cases) were included in the study. The mean follow-up period was 24.1 ± 8.8 months. The patients were divided into two groups: 51 patients (56 cases) without PF subchondral bone exposure were included in group A (Outerbridge grade 0,1, and 2) and 42 patients (45 cases) with PF subchondral bone exposure were included in group B (Outerbridge grade 3 and 4). The radiologic and clinical outcomes were compared between the 2 groups using the mechanical tibiofemoral angle (MTFA), a ratio of weight-bearing line (WBL), joint space width (JSW) of the lateral compartment., range of motion (ROM), visual analog scale (VAS), and modified Lysholm score. All of the radiologic outcomes showed no statistical significant difference between two groups. Thress clinical indices did not show statistical significant difference between group A and B after surgery. Conclusion: PF chondromalacia regardless of subchondral bone exposure did not influence the short-term outcome following HTO.

Abstract no.: 46814 HIGH TIBIAL OSTEOTOMY AND CORRECTION BY GRADUAL HISTOGENESIS USING LRS FRAME FOR OSTEOARTHRITIS OF THE KNEE

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High tibial osteotomy (HTO) is used to treat medial compartment osteoarthritis of the knee in active patients with varus alignment. In this study we review the clinical and radiographic outcomes associated with the HTO using LRS frame and gradual correction by distraction histogenesis. In 16 patients with medial compartment osteoarthritis of the knee and varus alignment, the LRS osteotomy frame was applied to the tibia in the operating room and a proximal tibial osteotomy was performed. Patients followed a gradual distraction histogeneis until the desired correction was achieved. The frame was removed when the osteotomy site had healed. Clinical outcome measures relating to the LRS included latency, time to correction, time in the frame, and complications. Radiographic outcomes included preoperative Kellgren-Lawrence (KL) grading of osteoarthritis, pre-and postcorrection limb alignment and tibial slope measurements. Average latency was 6 days, time to correction was 20 days, time in the frame was 19 weeks. Complications were similar to those for external fixators. Radiographic correction goals were met in all patients. The LRS frame is a valuable asset when using HTO to treat medial compartment osteoarthritis of the knee & it also has its added benefits, it is less invasive, no internal hardware present and needs shorter hospital stay and early return to activity

Abstract no.: 47073 DOES SUPERFICIAL MEDIAL COLLATERAL LIGAMENT RELEASE IN OPEN-WEDGE HIGH TIBIAL OSTEOTOMY FOR VARUS OSTEOARTHRITIC KNEES INCREASE VALGUS LAXITY? Seung-Suk SEO¹, Changrack LEE², Muwon KIM¹ ¹Haeundae Bumin Hospital, Busan (SOUTH KOREA), ²Busan Paik Hospital, Busan (SOUTH KOREA)

Purpose: To evaluate the changes in medial laxity of the knee joint as related to the complete release of the sMCL in patients who underwent OWHTO. Methods: 54 knees who received OWHTO and were followed for more than a year and for whom serial valgus stress radiography data were available were included. Medial joint space opening (MJO) was measured while valgus stress of 15 kgf was loaded on the knee joint. The MJO was measured before surgery, during surgery before release of the sMCL under anesthesia, after the release, and after fixing with a plate following the opening of the osteotomy site, as well as 3, 6, and 12 months after surgery. Results: The MJO significantly increased after the release of the sMCL compared with before the release (P< .001). The MJO measured after fixing with the plate following the opening of the osteotomy site was significantly decreased compared with that measured after the release of the sMCL (P< .001). and was not significantly different from the MJO measured before release of the sMCL. No significant difference was observed among MJOs that were measured 3, 6, and 12 months after surgery. Conclusion: Complete release of the sMCL during OWHTO increases the MJO. However, the MJO decreased to the level before sMCL release after fixing with the plate following the opening of the osteotomy site. Medial laxity induced by the complete release of the sMCL can be recovered by opening the osteotomy site.

Abstract no.: 47450 MID-TERM RESULTS OF LATERAL UNICONDYLAR MOBILE BEARING KNEE REPLACEMENT – A MULTI-CENTER-STUDY OF 363 CASES -

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The anatomical and biomechanical characteristics of the lateral knee compartment fundamentally differ from the medial side. Therefore the Oxford domed lateral device was introduced with a spherically convex, domed tibial plateau and a biconcave mobile bearing in order to reduce the dislocation rate. The aim of this independent multicenter-study was to assess the mid-term results of lateral mobile bearing UKR. We retrospectively evaluated 363 consecutive, lateral UKR performed in three hospitals for isolated lateral osteoarthritis. Mean age at surgery was 65 years (36 to 88 years) with a mean final follow-up of 37 months (12 to 93 months). 36 patients underwent revision surgery (10.5%) giving a survival rate of 90.1% at three years (95% CI 86.1 to 93.1) and 85.0% at five years (95% CI 77.9 to 89.9). Dislocation of the mobile bearing occurred in 5.6% at three years (95% CI 1.0 to 16.4) and in 8.5% at five years (95% CI 1.0 to 27.0). The clinical outcome in patients without revision surgery was good with a mean Oxford knee score (OKS) of 40.3 (95% CI 39.4 to 41.2), a mean Tegner activity score (TAS) of 3.2 (95% CI 3.1 to 3.3) and a mean UCLA score of 5.7 (95% CI 5.5 to 5.9). Similar to the previous design of the Oxford prosthesis we found a comparable dislocation rate and at least in our hands we could not observe a learning curve to solve that problem so that we cannot recommend lateral mobile bearing UKR in its current form.

Abstract no.: 48126 IN VIVO SAGITTAL PLANE KINEMATIC ANALYSIS OF OXFORD MOBILE BEARING MEDIAL UNICOMPARTMENTAL KNEE REPLACEMENT (UKR) AND ITS CORRELATION WITH FUNCTIONAL OUTCOME.

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This study analyzed the kinematic behavior of knee in the Indian population after UKR and its possible effect on the functional outcome. Two age and sex matched group of 15 knees each (Group A, Oxford Knee Score <34, Group B Oxford Knee Score >34) were analysed using X-Ray fluoroscopic kinematic analysis. The relationship between Patellar tendon Angle (PTA) and Knee Flexion Angle (KFA) was plotted and movement of mobile bearing was used to observe the movement of tibio-femoral contact point with knee flexion. The exercises performed were Step up and Deep Knee Bend. There was a linear relationship between the PTA and KFA in both the group with no statistically significant difference between the two groups. The movement of bearing between the two groups showed similar trend i.e. the tibio-femoral contact point moved anteriorly with increasing knee flexion up to about 80 degrees and then again moved posteriorly during deep knee bend due to the normal femoral roll back. The contact point in the Group A was 1.7 mm posterior (from 20 to 90 degrees of flexion) as compared to the Group B, which was statistically significant. There was no significant difference in the PTA values between the two groups (satisfied vs un-satisfied) when plotted against the Knee Flexion Angles. There was significant anterior translation of tibia of 1.7 mm from 20 to 90 degrees of knee flexion in the unsatisfied group. However, the pattern of tibio-femoral contact point movement was identical in both the groups.

Abstract no.: 46248 OXFORD PARTIAL KNEE REPLACEMENT FOR SEVERE VARUS DEFORMITIES IN INDIA.

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Background there is paucity of data for OUKA done for severe varus knees (HKA angle of more than 15 degrees). Objective to see if oxford unicompartmental knee replacement (ouka) is as effective in severe varus deformities as in mild to moderate varus. This is relevant in India as patients often come late for treatment Methods 17 patients (22 knees) with severe varus were identified in a cohort of 125 patients (194 OUKAs). Bilateral 14 patients (19 knees), unilateral 3 patients. Males 4, females 13. Age range 46 to 80. . Patients were followed for a minimum of one year and up to 18 months. Results in the selected patients with severe varus, the preop OKS (oxford knee score) was average 30.5 and postop OKS was average 46.9 with an average change of 16.4. Tegner activity level index was 0.9 preop and post op 2.9 with an average change of 2 levels. They had an average preop HKA (hip,knee,ankle) angle of 16.7 (range 15 to 24) and an average postop HKA angle of 6.7 (range 1 to 14) with an average correction of HKA angle of 6.7 degrees. Kennedy and White tibial zone was preop 0 and post op 1.7 average with an average shift of 1.6 zones laterally. Patients could do manual labour on farms. There were no complications. Conclusions in short term patients with severe varus do as well as others with OUKA. However long term follow up is needed.

Abstract no.: 46255 THE RATES OF REFERRAL FOR PATIENTS WITH FRAGILITY FRACTURES TO FALLS PREVENTION AND OSTEOPOROSIS SERVICES – A MANAGEMENT AUDIT

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Background The British Orthopaedic Association Standards for Trauma (BOAST) Guideline 7 suggests that "Fragility fracture and falls prevention (Fracture Liaison Services) should be fully integrated into fracture clinics, allowing screening of all patients and onward referral, where appropriate". Objectives The aim of the study is to evaluate how often patients with fragility fractures are appropriately screened and referred to falls prevention and osteoporosis services using BOAST Guidelines (August 2013). Methods All new patients with fragility fractures (age > 50) attending a fracture clinic over a fourweek period (5th to 30th September 2016) were included in the study. Clinic letters and casualty documentation was evaluated and all fragility fractures were identified. It was recorded if the patient was identified and referred as a result of potential osteoporosis or falls risk. Results Across the trust, a total of 771 new patients presented to fracture clinic. Fifty-five patients (n=55) were identified as having a fragility fracture. 40 female and 15 male patients were identified and the mean age was 68. Only one patient was referred for osteoporosis assessment and none of the patients were identified or referred for assessment of falls. Conclusions This study demonstrates significant shortfalls in referral of patients with a fragility fracture for assessment of osteoporosis and falls risk. Data suggests that units like this, and many more would benefit from a Service to specifically assess this patient population. This service intends to improve both investigation and treatment rates of osteoporosis and the management of falls risk.

Abstract no.: 46257 ASSESSMENT OF OSTEOPOROSIS IN PATIENTS PRESENTING WITH PROXIMAL FEMORAL FRACTURES: AN INDIAN PERSPECTIVE.

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Introduction: Patients presenting with proximal femoral fractures due to underlying osteoporosis in orthopaedic emergencies is on the rise world-over and soon to be regarded as an orthopaedic epidemic. Despite an increasing focus on this issue, the rate of osteoporosis diagnosis and treatment for high-risk patients, who have sustained a fragility fracture, remains low. Such patients are also at risk for future fractures. This problem poses a heavy burden on the medical and socio-economic resources of a developing country like ours. Methods: In this prospective study conducted at our institute, 100 patients of age more than 50 years presenting with proximal femoral fractures were assessed, for BMD (bone mineral density) by DEXA (Dual-energy X-ray absorptiometry) scan of hip and lumbar spine. Affected patients were started with anti-osteoporotic treatment in the hospital itself. Results: Out of the 100 patients evaluated 79 were males and 21 females. The average age of patients was 65.58 years (range 51-88 years). 49 patients had osteoporosis (T- score > -2.5) and 31 had osteopenia (T-score between -1 to -2.5). The ten-year probability of fracture in osteoporosis group (n=49) using FRAX (fracture risk assessment) tool was 33 % in females and 19% in males. Conclusion: Patients more than 50 years of age presenting with hip fractures provide us a unique opportunity to diagnose and institute the treatment of osteoporosis at an early stage to prevent future risk of fractures, thereby helping in establishing a protocol to counter this serious problem.

Abstract no.: 47025 CASE SERIES OF STRESS FRACTURES OF PROXIMAL TIBIA TREATED WITH OPEN REDUCTION AND INTERNAL FIXATION WITH PLATING AND FIBULECTOMY

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We present prospective analysis of 7 cases of proximal tibia stress fracture of knee with an average two years follow up. All our patients presented with history of pain and tenderness in proximal tibia without any history of significant trauma or fall. Our series includes 6 females and 1 men in the age group of 48 to 57years (average age 54 years). All of them were found to be osteoporotic (BMD T score >-2.5) and low vitamin- D levels. One patient was suffering from rheumatoid arthritis. All patients were treated by open reduction and internal fixation with locking compression plate and fibulectomy after a trial of conservative treatment. In two cases with severe osteoporosis (BMD T score >-3.5) intramedullary fibular graft was used to augment the fixation. Facture union was radiologically achieved between 5- 9 months. At six months knee range of motion on average was 120 degrees with average extention lag of less than 10 degrees. Average knee society score is 74. Open reduction and internal fixation with lateral locking compression plate allowed early mobilization, good functional outcome and union in management of proximal tibia stress fracture of knee. Intramedullary structural fibular graft can be used to augment the fixation in-patient's of proximal tibia stress fracture presenting with severe osteoporosis.

Abstract no.: 47631 INTRA-ARTICULAR PRP/HA:WHICH IS MORE EFFECTIVE ? Pradeep KAMBOJ¹, Ashish DEVGAN² ¹PGIMS, ROHTAK (INDIA), ²PGIMS, Rohtak (INDIA)

Introduction There is a plethora of treatment modalities available for Ostearthrosis including NSAIDS, exercises, intra-articular injections and surgery. We conducted the present study to show, the efficacy of intra-articular injections, by comparing PRP to Hyaluronic Acid (HA) for the treatment of knee osteoarthritis. Methods 47 patients (22 treated with HA and 25 with PRP) were treated and evaluated at 12 months of follow-up. The patients were enrolled according to the following inclusion criteria: age> 18 years, history of chronic (at least 4 months) pain or swelling of the knee and imaging findings of degenerative changes of the joint (Kellgren-Lawrence Score up to 3). All patients were prospectively evaluated before and at 1, 3, 6, and 12 months after the treatment by: VAS, WOMAC and KOOS scores. Adverse events and patient satisfaction were also noted. Results Only minor adverse events were detected in some patients, such as mild pain. Effusion after the injections was noted in 2 patients in the PRP group. At the follow-up evaluations, both groups presented a clinical improvement but the comparison between the two groups showed a statistically significant difference in all scores evaluated. After final follow up patients treated with PRP had better outcome. Conclusions Our results suggest that both intra-articular hyaluronic acid and PRP injections are safe and effective modality of treatment for early OA of knee joints. Effects of HA tends to wean off early. Autologous PRP injections showed more and longer efficacy than HA.

Abstract no.: 47193 AUTOLOGOUS BLOOD INJECTIONS IN TENNIS ELBOW: EXPERIENCE FROM A DEVELOPING COUNTRY - INDIA

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Objectives: Lateral epicondylitis, is a common problem encountered in the orthopaedic practice. Histopathological reports have shown that lateral epicondylitis is not an inflammatory process but a degenerative condition termed 'tendinosis'. Beneficial effects of local corticosteroid infiltration have sound lack of scientific rationale, since surgical specimens show lack of any inflammatory process. Recently an injection of "autologous blood injection" has been reported to be effective for lateral epicondylitis. It is hypothesized that blood contains platelet derived growth factors that induce fibroblastic mitosis, and chemotactic polypeptides such as transforming growth factor cause fibroblasts to migrate and specialize and have been found to induce healing cascade. The objective of the study is to evaluate the efficacy and role of autologous blood injection versus local corticosteroid injection in the management of lateral epicondylitis. Materials and Methods: A prospective, randomized study was done with 80 patients. 40 patients received autologous blood and rest 40 patients received local corticosteroid at the lateral epicondyle. Outcome was measured using 'Visual analogue score', 'Nirschl staging' and 'Verhaar et al staging'. Chi square test and Unpaired T test was applied to calculate the significance of results. Results: Follow-up done for total 6 months divided into intervals. At 12th week and 6 months follow up, autologous blood injection group showed statistically significant decrease in pain with no recurrence compared to corticosteroid injection group. Conclusion: Autologous blood injection technique for lateral epicondylitis offers an effective and cheap treatment option especially in India where cost and compliance is an issue.

Abstract no.: 47237 TOTAL HIP ARTHROPLASTY IN CASES OF RHEUMATOID ARTHRITIS: DOES MEDICATION WORK?

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Background: Some recent reports indicate that the number of total hip arthroplasty (THA) procedures for rheumatoid arthritis (RA) patients has been decreasing in recent years. Bone destruction inhibition by use of biological drugs has been suggested as a possible reason. However, few studies have investigated whether hip joint destruction in RA patients was altered by treatment with such new drugs. Objectives: The purpose of this study was to examine whether the number of RA cases requiring THA has shown a decreasing trend, and to identify any reason for a change. Methods: We investigated the records of all patients with RA who underwent a THA procedure at our hospital from 2000 through 2015. We noted the number of THA cases each year, age at surgery, duration of RA, and medications administered. In addition, we evaluated pre-operative X-ray findings using the Larsen classification. Results: In the 15 year period there were 786 primary THA cases, of which 67 (8.5%) were RA cases. The number of THA showed a decreasing tendency, approximately 30%. Cases classified as Larsen grade 5 (severe joint destruction) by X-ray evaluation decreased. Conclusions: The number of patients who underwent THA for RA was decreased and the patient medications administered were also changed. Preoperative X-ray evaluations showed that cases of severe joint destruction (Larsen grade 5) were remarkably decreased. We consider that bone destruction of hip joint can be inhibited by use of biological drugs.

Abstract no.: 47292 COMPARATIVE ANALYSIS OF PERIPROSTHETIC FRACTURES AFTER TOTAL HIP ARTHROPLASTY IN PATIENTS WITH RHEUMATIC DISEASES.

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Background. Surgical treatment of patients with rheumatic diseases (RD) is linked with increased risk of complications because of an inflammatory process presence, osteoporosis, the reduced physical activity, long-term glucocorticoid and biologic diseasemodifying antirheumatic drugs (DMARDs) therapy. These conditions increase the risk of perioperative complications, including periprosthetic fractures. Objective: to compare frequency of periprosthetic fractures of the acetabulum, greater and lesser trochanter after total hip arthroplasty (THA) in patients with rheumatic diseases (RD) during the surgery and in postoperative period. Materials and methods. 1177 of total hip arthroplasty surgeries were performed in total of 943 patients with RD during the period from 1998 to 2016 (OA - 558, RA - 383, JRA - 144, SLE - 92). Results: We identified 64 (5.44%) cases of periprosthetic fractures after THA in patients with RD: - 23 (6.00%) fractures in RA patients; - 15 (10.43%) in patients with JRA; - 8 (8.69%) in patients with SLE; - 18 (3.23%) in patients with OA. In 38 cases osteosynthesis was performed, in 26 (68.42%) of them there were patients with RA, JRA and SLE. The statistical analysis of the obtained data revealed a significantly greater number of complications in patients with RA, JRA and SLE (p<0.005). Conclusions. Obtained results confirm that the risk of periprosthetic fractures is greater in patients with RD, especially with RA, JRA, SLE. Therefore, these patients require a special treatment, which consists of the competent medical treatment of osteoporosis and careful bone-management during surgery.

Abstract no.: 47291 PREVENTION AND TREATMENT OF VENOUS THROMBOEMBOLISM IN PATIENTS WITH RHEUMATOID ARTHRITIS UNDERGOING TOTAL KNEE ARTHROPLASTY

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Background/Objectives In this study analyzed incidences of VTE in patients with RA and OA after TKA, compared different types of VTE prevention in this groups Methods We studied 436 patients for the period 2013-2016. Of these, 154 patients with RA(35.4%) and 282 patients with OA(64.6%). For a comparative analysis of the efficiency anticoagulant therapy, patients group was divided into 4 subgroups by type of drug therapy. The firstnadroparin calcium, the second-dabigatran etexilate; the third-nadroparin calcium with transfer to dabigatran etexilate:the fourth group-without medication.Doppler ultrasonography was routinely performed preoperatively and on postoperative day 7.14.1 time a month. Results VTE cases were reported in 19(4.3%) patients.2 of them(0.5%) with RA and 17(3.8%) with OA.Both RA patients developed distal deep vein thrombosis. The first patient with RA received dabigatran etexilate only,DVT of the lower limbs developed on 15 days after total hip replacement. The second patient with RA from the fourth subgroup:DVT was diagnosed on 3 months after surgery.Of the 19 cases of VTE 12 (62.5%) were asymptomatic and 7 (37.5%)-with development of clinical and laboratory picture.Both cases of thrombosis in a group of RA were asymptomatic.In a perioperative period clinically significant bleeding was not seen. Major bleeding was documented in 7(2.4%) patients with OA and 2(1.2%) patients with RA Conclusions Cases of VTE in patients with RA lower than patients with OA.Number of asymptomatic deep vein thrombosis prevails over development of clinical and laboratory complex of symptoms in both groups.Combined drug VTE prevention in patients with RA and OA has been most effective and safe, no cases of VTE has not been registered

Abstract no.: 48503 ROLEOF NUCLEAR MEDICINE INUNUSUAL CASES OF SERONEGATIVE INFLAMMARORY DISORDERS

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Role of nuclear medicine is well established for bone malignancies both primary and secondary. In inflammatory disorders the diagnosis in well established cases is not difficult on clinical examination, serology and radiological like x-ray, MRI, biopsy etc. But many cases present with unusual presentation which does not lead to diagnosis. Such cases suffer from months to years. The importance of nuclear medicine lies in such cases or in cases patient presents like of malignancy as in multiple myeloma or metastasis in old age and on bone scan and pet ct is diagnosed as inflammatory disorder. This is study of 50 cases in which 42 presented with chronic vague problems and 8 with acute in old age. Age varied from 7vrs to 75vrs. Female male 27-23. In these cases the diagnosis was established provisionally after increase up take was seen in patient sacroiliac joints along with peripheral joints like mp joints, carpel and tarsal joints wrist joint etc. In these a provisional diagnosis of inflammatory disorder made and treatment started. Patient response was surprisingly excellent with back to work. Patients were given same treatment as for seronegative rheumatoid and seronegative spondyloarthropathy. in few metabolic disorders like osteoporosis and osteomalacea treatment also given, few needed differentiation from these metabolic disorders. So it can safely be concluded that nuclear scan can help where even MRI and serology may not help as nuclear scan screens all the joints which helps in clinching the pathology.

Abstract no.: 47805 HOW CAN DEXAMETHASONE INCREASE ANALGESIC DURATION AFTER SHOULDER ARTROSCOPY?

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Introduction: Glucocorticoids are reported to improve postoperative analgesia in shoulder arthroscopy. Aim: To compare the effect of i.v. dexamethasone with that of perineural dexamethasone on the prolongation of analgesic duration of interscalene brachial plexus block (ISB) for shoulder arthroscopy. Methods: This is a prospective double-blind randomized placebo-controlled study in patients undergoing elective arthroscopic shoulder surgery under regional anesthesia with a single-shot ISB (ropivacaine 0.5% 30 mL). Patients were randomized in three groups: ropivacaine 0.5% (G1); ropivacaine 0.5% + dexamethasone 8 mg perineural (G2); and ropivacaine 0.5% + dexamethasone 8 mg i.v. (G3). Pain free interval, total analgesic use and satisfaction score with pain control during first 24 hours postoperative were recorded. Results: Between 1/2015-5/2016, 129 patients were randomized. 120 patients (51F/69M) with a mean age of 57.6 years (range, 18-79 years) completed the study (forty patients -each group). The median duration of analgesia was significantly different between the three groups (G1, 12.65 [12.1-13.1] h; G2, 21.09 [19.9-22.2] h; and G3, 22.5 [21.2-23.6] h; p = 0.0001). Total analgesic use presented a significant lower consumption comparing G1 group to G2 and G3 respectively (p<0,0001). In both dexamethasone groups (G2 and G3) patient satisfaction was significantly higher in comparison with G1 group (p<0.001). Conclusion: Dexamethasone significantly prolongs the duration of analgesia for ISB when added perineural and even more when administrated i.v. Analysis showed significantly lower median consume of analgesics in dexamethasone groups comparing with G1. Dexamethasone added perineural and mostly i.v. has decreased postoperative pain and increased patient satisfaction.

Abstract no.: 47581 EMG IN DIAGNOSIS OF PIRIFORMIS SYNDROME: RELIABILITY OF PERONEAL H-REFLEX ACCORDING TO RESULTS OBTAINED AFTER SURGERY, BOTOX INJECTION AND MEDICAL FOLLOW UP. Hassan NAJDI, Elie MAKHOUL, Hussein FARHAT, Roger JAWISH Sacre Coeur hospital, beirut (LEBANON)

Introduction: Fibers of common fibular nerve fibers at proximal sciatic nerve are the most vulnerable in piriformis syndrome (PS). We studied the reliability of peroneal H-reflex in rest and stress position to prove the presence of sciatic impingement. Materials: peroneal H-reflex performed in 27 patients, 8 females and 19 males, aged 22 to 65 years, selected according to PS clinical criteria. Latency and amplitude of H-reflex defined and the delay of latency between physiologic and stress position measured. Peroneal H-reflex tested for both affected and unaffected sides, in rest and stress positions. Results: From 11 operated patients with 4ms < delay <9 ms, 10 had complete improvement and 1 remained in pain. For 7 patients having injection of Botox 100-300 IU, with 5ms < delay <7 ms had a transient recovery, 4 of them have benefited later from surgery, the 3 others reproved pain. Between 9 patients who have declined invasive treatment, 7 patients with 4ms < delay <10ms didn't demonstrate any improvement after medical treatment and are considered suspected of PS, 2 others with delay <4 ms recovered from a non-confirmed PS. Conclusion: peroneal H-reflex is a reliable test for diagnosis of PS; we have observed variable values of delay until extinction of H wave during painful maneuver which immediately reappeared in physiologic position. A range of delay of latency of peroneal Hreflex could be classified into three level of suspected PS, high: 5 ms < delay <10 ms, moderate: 4ms <delay <5 ms, poor: <4 ms

Abstract no.: 46507 WORKABILITY IN PATIENTS WITH RHEUMATOID ARTHRITIS

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Background: Rheumatoid arthritis (RA) can lead to work disability and retreat from the labour market. The indirect costs related to work disability are higher than direct treatment costs. Workability in RA is influenced by many factors, including disease activity as well as symptoms, which are components of the frailty syndrome. Objectives: This study aimed to determine the association of workability with disease activity, pain, functional disability and frailty in patients with seropositive rheumatoid arthritis. Methods: We conducted a crosssectional study at a rheumatologic outpatient clinic including 100 seropositive RA patients in working age (<65 years). Workability was assessed with the Work Ability Index questionnaire. For disease activity, we used CDAI, VAS for pain assessment, HAQ-DI for functional disability, and SHARE-FI for the degree of frailty. After testing for normal distribution, bivariate correlations between workability and associated variables were calculated using Spearman's correlation coefficients. Results: Of 100 patients, 58 could be assessed for the workability index (37 female, average age 64.8 years, average disease duration 93.9 months). 8 patients reported excellent, 27 good, 16 moderate, and 7 poor workability. Workability was correlated with pain intensity (rs= 0.42, p<0.001), disease activity (rs=0.40, p<0.002), functional disability (rs=0.64, p<0.000), and frailty (rs= 0.623, p<0.000). Conclusion: A considerable portion of employed patients reported poor or moderate workability, which was significantly associated with disease activity as well as with the other parameters assessed. In patients with RA, adequate therapy may therefore not only improve clinical outcomes, but also provide socioeconomically advantage by maintaining patients' workability.

Abstract no.: 46775 MESENCHYMAL STEM CELLS AUTOLOGOUS TRANSPLANTATION FOR REGENERATIVE RESTORATION OF LOCAL FULL THICKNESS KNEE CARTILAGE INJURY: 2 YEARS CLINICAL RESULTS Dzmitry BUKACH REPUBLICAN SCIENTIFIC AND PRACTICAL CENTRE FOR TRAUMATOLOGY AND ORTHOPEDICS, Minsk (BELARUS)

Introduction: Transplantation of mesenchymal stem cells (MSC) seems to be an effective method for local full thickness cartilage lesion treatment. However, a very few number of clinical trials is published. Methods: 10 patients with local full thickness knee cartilage lesions were treated by developed method, using cultivated autologous bone marrow MSC predifferentiated into chondral direction (MSCch). For transplantation a non-scaffold local adherent technique from 3-4 cm mini access was used: the knee was positioned so that the refreshed cartilage defect was upward, the MSC graft was dripped onto the cartilage defect and the knee was held stationary for 10 minutes to let MSC to adhere on defect surface. We analyzed the dynamic of Visual Analogue Scale (VAS) and Lysholm Knee Scoring Scale before and 2 years after surgery. The cartilage regenerate condition was examined by MRI and evaluated by MOCART scale. The MRI results of the investigated group were compared with control group results (15 patients) with full thickness defects, treated by bone marrow stimulation. Results: Clinical outcomes shows significant improvement of VAS and Lysholm values 2 years after surgery (p<0.05). The compare of MOCART score of MSC group with bone marrow stimulation group shows authentically better results in the first one group (p<0.05). Conclusions: The results revealed the MSCch graft due to local adhesion achieves regenerative recovery of full thickness cartilage injury. A significant improvement of clinical state is observed. MRI shows better quality of regenerative tissue after MSC transplantation than after bone marrow stimulation.

Abstract no.: 47877 THE LIPO-AMIC: SURGICAL TECHNIQUE AND FIRST PATIENTS REPORT OF AN ADVANCED CARTILAGE REPAIR PROCEDURE Fabio Valerio SCIARRETTA CLINICA NOSTRA SIGNORA DELLA MERCEDE, rome (ITALY)

In this pilot study we describe the development, the surgical technique and preliminary outcomes of autologous matrix-induced chondrogenesis combined with simultaneous use of autologous adipose tissue derived stem cells, defined as LIPO-AMIC, for the treatment of knee full thickness cartilage defects. Methods: Eighteen patients that underwent LIPO-AMIC for full thickness knee defects have been prospectively evaluated during two years clinically and by MRI. Median age of the patients was 43,9 years (range 28-58). Defects were situated in the patella (n =11), in the femoral throclea (n = 5) and lateral femoral condyle (n = 2). Results: Patients showed progressive significant clinical improvement of all the scores (Lysholm, Koos and VAS) as early as the initial 6 months follow-up and further increased values were noted till the last follow-up at 24 months postoperatively. MRI examination showed early subchondral lamina regrowth and progressive maturation of the repair tissue and moderate to complete filling of the defects. Conclusions: The AMIC technique is the most described one-step cartilage repair procedure in the literature, and has been determined to be safe and effective in treating full-thickness cartilage defects. The recent literature has clearly stated that adipose tissue can represent the ideal sourse of mesenchymal stem cells. This study clearly demonstrated the LIPO-AMIC we proposed to be feasible for the treatment of knee focal cartilage defects and to result in a statistically significant progressive clinical, functional and pain improvement in all treated patients, starting from the six months follow-up, earlier than what reported for the AMIC technique.

Abstract no.: 48139 SURGICAL TREATMENT OF PATIENTS WITH ISOLATED OSTEOCHONDRAL DEFECTS OF THE KNEE JOINT ASSOCIATED WITH VARUS DEFORMITY

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Objective: To improve the surgical results of osteochondral deformity in femur by optimizing biological and mechanical properties of cartilage regeneration. Materials and methods: From 2010 to 2017, 15 patients (25-38 years) with isolated knee articular cartilage defects of various etiology, staged from III - IV (according to Outerbridge) with concomitant varus deformity were surgically treated. The autologous matrix-induced chondrogenesis (AMIC) method was performed using Chondro-Gide membrane in combination with autologous platelet rich plasma (PRP). Simultaneous varus correction of the knee was achieved by means of "opening wedge" High Tibial Osteotomy. The defect area was from 2 to 8 cm². Results: The time of follow-up ranges from 2 to 7 years. The evaluation was performed using the IKDS scale, visual analog scale VAS, MRI (T2mapping) and morphological evaluation of the regenerate. Conclusions: The matrixinduced autologous chondrogenesis (AMIC) has a therapeutic effect directly on the cartilage defect. PRP is a stimulating factor for regenerative processes. Correction of the biomechanical axis of the lower limb allows to reduce the load on the medial compartment of the knee joint. During our study, we observed the following: The structure of tissue samples taken from the collagen membrane application site, is similar to the structure of the hyaline cartilage. Young chondrocytes found in that site, are having the ability to divide and produce collagen. Perhaps such a complex therapeutic effect will not only improve the results, but also lead to preserving the lower limb for a longer time.

Abstract no.: 47317 ALLTHROUGH SCOPIC REDUCTION AND FIXATION WITH FLOUROSCOPIC CONFIRMATION OF DEPRESSED TIBIAL PLATEAU FRACTURES Ahmed GAD

cairo university hospital, giza (EGYPT)

Malreduced plateau fractures are capable of causing severe consequences. Good visualization of the articular surface improves quality of reduction which is key for successful results. Arthroscopic assistance showed inherent advantages in the reduction of the articular surfaces while the corresponding intra-articular structures are thoroughly examined. Stable fixation can be achieved with the least amount of dissection. Purpose of this study was evaluating the functional and radiographic results and the complications of arthroscopically allthrough assisted reduction and fixation for tibial plateau fractures. 28 patients having tibial plateau fracture with associated depression were included in this study. Delay of surgery an average of 7 days for subsidence of swelling. An ACL guide is used to insert a guide pin directed towards the most depressed part of the fracture. Delamination of cortical bony window with preservation of the cortical chip. Elevation and fine manipulation of the depressed parts through this window under scopic visualization. Filling the defect with iliac bone plugs to prevent subsidence of the elevated cartilage. Minimaly invasive fixation with arthroscopic assisted insertion of subchondral cannulated screws associated with flouroscopic guidance and confirmation. Immediate postoperative ROM with non weight bearing for at least 6 weeks. Patients were evaluated clinically and radiographically using Rasmussen scoring system. 19 patients (68%) were excellent, 7 patients (25%) were good while two patients(7%) showed fair results. Arthroscopic assistance is a fair method for full job reduction and fixation of depressed tibial plateau fractures and repair of associated lesions with preservation of the soft tissue envelope.

Abstract no.: 46379 PATELLA FEMORAL ARTICULAR CARTILAGE LESIONS IN 700 KNEE ARTHROSCOPIES

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Purpose: The purpose of this study is to document prevalence of the chondral lesions in patients with symptomatic knee requiring arthroscopy and to evaluate particularly preventable possible reasons of lesions. Methods: Seven hundred consecutive knee arthroscopies of 651 patients were analysed retrospectively. The mean age was 43 (range;7-82) of 331 male and 320 female patients. Cartilage lesions were classified according to the Outerbridge classification. Knees were separated into three groups according to the cartilage lesions in patellafemoral (PF) joint. Knees, in the group one, have no cartilage lesions, in the group two, they have type I-II cartilage lesions, in the group three, type III-IV cartilage lesions. These groups were compared statistically in terms of age, gender, presence of patellar tilt in arthroscopic view, patellar translation and medial parapatellar plica. Results: PF chondral lesions (in 176 knee grade I-II, 149 knee, grade III-IV) were found in 46.4 % of the knees. The difference was statistically significant in terms of age (p<0.0001), gender (p<0.05), patellar tilt (p<0.001) and medial parapatellar plica (p<0.05) but patellar translation (p>0.05). Conclusion: This study shows that PF cartilage lesions are guite common. Beside age, which is most expected reason of PF cartilage lesions, female gender, patellar tilt and medial parapatellar plica were very often associated with PF cartilage lesions. We believe that some of the reasons (i.e. patellar tilt, parapatellar plica) might be eliminated before symptoms have appeared. The arthroscopy provides an opportunity to assess and verify the location, grading and actual size of the cartilage lesions.

Abstract no.: 48757 CHONDROTISSUE: IS IT A SOLUTION FOR CHONDRAL LESIONS? Mohammed ELRAKAYBI Saudi German hospital, jeddah (SAUDI ARABIA)

Chondral ulcers of the knee joint are considered a challenge for orthopedic surgeons especially in the young active pateients. The aim of the study is to analyze the clinical and radiological outcomes after treatment of chondral ulcers by arthroscopic drilling associated with covering the ulcer with absorbable polyglycolic acid hyalournan implant impregnated in autologous platelet rich plasma solution. Patients: 28 patients(18 males and 10 females) with a mean age of 39 years(23-51). All suffering from medial femoral condyle defects except 3 had patellar defects. The patients under went arthroscopic drilling of the defect followed by covering it with the aforementioned implant and fixed using smart pins. Mean follow-up period was 3 years. Patients were evaluated using the Knee outcome survey(Activity of the daily living scale ADLS) before surgery then 3 month, 6 month and a year after the procedure. Magnetic Resonance Imaging(MRI) was done one after surgery to detect graft incorporation and defect healing. Results: The knee outcome survey shows clinical significant improvement (P value less than 0.05) in all terms compared to preoperative score. MRI showed graft incorporation and ulcer healing in all cases. Conclusion: There was marked clinical improvement by the application of chondrotissue and it is considered as a sufficient line of management in cases of chondral defects and ulcers.

Abstract no.: 48209 THE ASSOCIATION OF ATHLETE'S FEAR AVOIDANCE WITH PHYSICAL FUNCTION AND PAIN INTENSITY

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Background: Athlete's fear avoidance – a set of maladaptive beliefs about injury and ability to return to sport - may play an important role in the recovery process of injured athletes and explain why some athletes are able to reach their preinjury abilities while others are unable to return to sport. We hypothesized that athlete's fear avoidance explains (i) decreased physical function and (ii) increased pain intensity over and above clinical and psychological variables previously shown to be important in injured athletes? Methods: 102 injured athletes (84% male; age 25±8.5 years) from an orthopedics sports medicine center completed a demographic questionnaire, the Athlete Fear Avoidance Questionnaire, the Pain Catastrophizing Scale, the Hospital Anxiety and Depression Scale and two PROMIS measures: Physical Function CAT and Pain Intensity. Results: In a hierarchical multiple linear regression athlete fear avoidance (b=-.32; p=.002) and upper extremity injury region (b=6.17; p<.001) were the only factors independently associated with physical function, after accounting for covariates. Of these, fear avoidance explained 7.3% of the variation in physical function. In a second hierarchical regression, surgery (b=-5.31; p=.010) and pain catastrophizing (b=.29; p=.001), but not athlete fear avoidance were the only factors independently associated with pain intensity after controlling for covariates. Conclusions: In injured athletes, fear avoidance is independently associated with decreased physical function, while pain catastrophizing is associated with high pain intensity. Both level of athlete's fear avoidance and catastrophic thinking should be accounted for in clinical interventions aimed at helping athletes improve recovery and return to sport.

Abstract no.: 48504 NON-SURGICAL AND SURGICAL TREATMENT OF PROXIMAL HAMSTRING AVULSIONS Elsa PIHL

., Stockholm (SWEDEN)

Introduction: There is a lack of evidence how to treat proximal hamstring avulsions, surgical or non-surgical. There are no studies comparing both treatments. Methods: We included 47 patients treated 2007 to 2013 for proximal hamstring avulsions at Danderyd Hospital, Sweden and followed up all patients after at least 2 years. In all cases MRI showed avulsion of two or three tendons from the tuber ischi before initiation of treatment. The primary outcome measure was Lower Extremity Functional Scale. LEFS is a validated patient related outcome measure for the lower extremity, maximum score 80. We performed a regression analysis and adjusted for gender, ASA-class an MRI findings at diagnosis. Results: 33 patients were surgically- and 14 non-surgically treated, the mean age at surgery was 50 years (SD±9) and 17(51%) were females. LEFS in the surgically treated group was 73 (SD±12) and in the non-surgically treated group 72 (SD±16). In the regression analysis, we found no correlation between treatment and LEFS. Discussion: This is the biggest study with both surgical and non-surgically treated proximal hamstring avulsions. The LEFS score in our study is similar to previous studies. In our study the patients have been allocated to treatment arm according to clinical- and MRI findings at diagnosis. Conclusion: We couldn't find any difference between the groups in the patient related outcome measure, LEFS. Since our study probably have a selection bias, a randomized clinical trial is necessary to measure the effect of surgery on patient reported outcome after acute proximal hamstring avulsion.

Abstract no.: 47494 NASAL CHONDROCYTES-BASED ENGINEERED AUTOLOGOUS CARTILAGE TISSUE FOR THE REPAIR OF ARTICULAR CARTILAGE DEFECTS: AN OBSERVATIONAL FIRST-IN-HUMAN TRIAL Geert PAGENSTERT¹, Marcus MUMME¹, Andrea BARBERO², Ivan MARTIN², Marcel JAKOB¹ ¹Dep. Orthopaedic Surgery, University Hospital of Basel, Basel (SWITZERLAND), ²Dep. Biomechanical Engineering, University of Basel, Basel (SWITZERLAND)

Objectives: Articular cartilage injuries have poor repair capacity and cannot be predictably restored by conventional treatments or advanced therapies based on articular chondrocytes (AC) implantation. As compared to AC, nasal septum-derived chondrocytes (NC) have superior and more reproducible capacity to generate hyaline-like cartilage tissues, with the plasticity to adapt to a joint environment. We assessed whether engineered autologous NC-based cartilage grafts allow safe and functional restoration of knee cartilage defects. Methods: In a first-in-human trial, ten patients with symptomatic, post-traumatic full-thickness cartilage lesions (2-6cm2) on the femoral condyle/trochlea were treated at our institution. Chondrocytes, isolated from a 6-mm nasal septum biopsy, were cultured onto collagen membranes to engineer cartilage grafts (30×40×2mm size), that were implanted in defects via mini-arthrotomy and assessed up to 24 months after surgery. Primary outcomes were feasibility and safety of the procedure. Secondary outcomes included self-assessed clinical scores and MRI-based estimation of morphological (MOCART score) and compositional quality of the repair tissue (dGEMRIC and T2 mapping). Results: For each patient it was feasible to manufacture cartilaginous grafts with chondrocytes embedded in extracellular matrix rich in glycosaminoglycan and type II collagen. No adverse reactions were recorded. Mean IKDC self-assessed scores improved significant from preoperative to 24 months postoperative. Radiological assessments indicated defect filling and development of repair tissue approaching composition of native cartilage at 24 months as indicated by dGEMRIC evaluation and T2 mapping. Conclusions: Hyaline-like cartilage tissues, engineered from autologous nasal chondrocytes, can be clinically used for repair of articular cartilage defects in the knee.

Abstract no.: 47030 SURGICAL REPAIR OF PROXIMAL AVULSION OF THE RECTUS FEMORIS MUSCLE IS ASSOCIATED WITH A PREDICTABLE RETURN TO HIGH-LEVEL

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Background: Proximal avulsion of rectus femoris muscle is an uncommon injury. However, it may be associated with significant morbidity in elite sportspeople or individuals involved in high level sports. The aim of this study was to review the clinical presentation, radiological investigation, treatment and outcome of patients presenting with this injury between 2003 and 2016. Methods: 43 patients presented with avulsion injuries of the rectus femoris tendon and were included in this study. Patients were all elite or high level footballers, rugby players, hockey players and martial arts practitioners. Results: A total of 25 patients required surgical intervention whereas 18 patients were treated nonoperatively. Surgical intervention resulted in a return to play at a mean of 11.9 weeks (5-17), which was slower (not significant) than non-operative management at a mean of 9.6 weeks (5-13). There were 4 re-injuries in the non-operatively managed group, and none in the operative group. 11 patients in the non-operatively managed group and 21 in the operated group had greater than 90% strength at 6 months. Conclusion: Injuries of the origin of the rectus femoris muscle are rare. Both non-operative and surgical treatment resulted in a satisfactory outcome with a mean recovery time of 6 to 12 weeks but surgery was associated with fewer re-injuries and better strength recovery.

Abstract no.: 48756 ADIPOSE DERIVED STEM CELLS VS FK506 ENCHANCED PERIPHERAL NERVE REGENERATION. EXPERIMENTAL STUDY IN A RAT MODEL.

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Introduction: In this study we assessed in vivo the impact of undifferentiated adipose derived stem cells and FK506 in combination with biodegradable conduits in peripheral nerve regeneration. Methods: 20 male Wistar rats were divided in 4 groups. Groups A and B were the controls, whereas C and D the experimental groups. A complete transection of the sciatic nerve and a 10mm nerve defect was created in all rats. In group A, 10mm of the nerve were removed and recoaptated in lieu of a reversed autograft. In the rest groups the defect was bridged with a biodegradable conduit. In the conduits of group B normal saline was applied, in C they were enhanced with stem cells, and in D with FK506. Nerve regeneration was evaluated 12 weeks later. Gait analysis was conducted and the sciatic functional index was calculated. Additionally, the repaired nerves were evaluated by electrophysiological studies and histology. Results: The mean SFI in 12 weeks was impressively reduced in groups A(-63), C(-59) and D(-55) in comparison with group B(-74). Increased compound muscle action potential, and reduced nerve conduction latency of the repaired nerves were documented in the electrophysiological studies in all groups. Histology revealed more nerve axons and thicker myelin sheath formation in groups C and D. Conclusions: Successful peripheral nerve regeneration can be accomplished after a 10mm nerve gap. Autografts provide superior regeneration; however, nerve conduits may also provide a very good outcome. Superior peripheral nerve regeneration was observed when undifferentiated stem cells or FK506 were applied.

Date: 2017-12-02 Session: Developing World Free Papers Time: 10:30 - 12:00 Room: 09. Room 1.63

Abstract no.: 48368 USE OF CHARLSON'S CO-MORBIDITY INDEX IN PREDICTING ONE YEAR MORTALITY IN ELDERLY HIP FRACTURE PATIENTS : A PROSPECTIVE STUDY IN SECONDARY CARE HOSPITAL Jayasankar VISWANATH¹, Perur JAYASANKAR²

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Introduction : Hip fractures in elderly are a rising concern in developing nations as the elderly population increases rapidly. Studies have shown that there are various factors that influence morbidity in these patients. The purpose of this study was to assess the relationship between co-morbidites and morbidity, mortality rates in hip fracture patients at one year. Methods : 172 patients aged 60 and above with history of fragility hip fractures who underwent surgical management in a secondary care hospital were included. Variables analysed included age, type of fracture, pre-fracture mobility status, Charlson's comorbidity index, time interval for surgery, length of hospital stay, complications at one year follow up were analysed. Results : 54% were women, the mean age of 77.4 ± 8.3 years. The overall one year mortality for men and women was 18.9% and 17.2% respectively. Age > 80, Low parker mobility scale (less than 4), Charlson's comorbidity index more than 2, delay for surgery for more than 48hours were significantly (P<0.05) associated with one year mortality. A comprehensive hip fracture program with attention to managing the comorbidities will help improve the outcomes of the elderly patient who sustain hip fractures.
Abstract no.: 48440 NATIONWIDE TRENDS ON AWARENESS AND ATTITUDES TOWARD RADIATION RISKS IN ORTHOPAEDIC RESIDENCY TRAINING

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Background. The aim of this study is to analyze both awareness on practical knowledge in radioprotection, and attitudes toward occupational radiation risks among orthopaedic residents in the Philippines. Methods. 156 orthopaedic residents from 13 training institutions duly recognized by the Philippine Board of Orthopaedics (PBO) responded and were included in the study. Respondents completed our questionnaire with 13 evidence based, multiple-choice questions on x-radiation exposure and safety. The chisquared test was utilized to compare proportions, with a p-value <0.05 considered statistically significant. Results. Only 72 (46%) residents have read any literature on occupational radiation safety. Majority (98%) of them knew about the thyroid shield but only 87 (56%) use it, with the disparity found statistically significant (p<0.001). Although 82 (52%) believed pregnancy testing was mandated for all patients of childbearing age, only 59 (38%) ask for a pregnancy test accordingly, with the disparity found statistically significant (p=0.009). Majority (90%) were aware the junior surgeon was more at risk than the senior surgeon, but only 46 (29%) knew scattered radiation was not as harmful as direct radiation. 108 (76%) of them care about the cumulative radiation dose when requesting multiple radiological studies, but only 15 (10%) understood the ALARA principle (p<0.001). Conclusions. Orthopaedic residents seem to be lacking in both awareness and attitudes on radioprotection in orthopaedic trauma care. We recommend that all residents be made properly aware of occupational radiation risks, and receive radiation safety training.

Abstract no.: 47672 CHRONIC OSTEOMYELITIS. TREATMENT WITH LOCAL STERILE AND RESORBABLE BEADS OF PLASTER OF PARIS EMBEDDED WITH ANTIBIOTICS AS ADJUVANT TO SURGERY

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Chronic osteomyelitis (COM) is a worrying neglected public health issue. Treatment controversy remains over the type, duration and route of antibiotics after debridement. Compliance and affordability for long course antibiotic stay challenging. In Rwanda outreach surgery clinics towards districts were organized in 2015-2016. 36 COM patients were operated and postoperatively 15 got systemic antibiotics (Arm I) and 21 (Arm II) local antibiotics embedded in sterile resorbable beads of Plaster of Paris. Drugs were prescribed following culture and antibiotics sensitivity. We evaluated retrospectively outcome of the patients 6 months to 1 year later. Ethics Committee of the University Hospital of Kigali (CHK) issued approval. Consent form was explained and signed by patients or guardians. Patients COM had their files reviewed, physically examined and radiographed. Results: Average age: 19Y (0 - 66). Male patients were predominant (R: 2,6/1). Predominant etiology 89%: Neglected acute osteomyelitis. 34(94%) patients classified Cierny-Mader 3 and 4; 24(67%) malnourished (Class B). Staphylococcus identified for 18 (50%) samples, 4 E. coli, 2 Klebsiella and 12 unidentified. Bones affected: tibia 20(56%), Femur 6 (17%), Humerus 6(17%), Fibula 2(5%) ulna: 2(5%). Hospital stay duration average: 13 days (4 - 39 d) and there were no significant difference between the 2 arms. By time of patients review, 23 patients hade wound and sinus dried Arm1: 7/15 (46%) and Arm 2:16/21 (76%). 6 of Arm 1 need re-debridement. Conclusion: Local antibiotics are promising, cost effective COM treatment adjuvant to surgical debridement in developing word.

Abstract no.: 46311 LARGE BONE DEFECTS TREATED WITH INDUCED BIOMEMBRANE TECHNIQUE - A CASE SERIES

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Background: Segmental bone defects are complicated problems with significant long term morbidity. Historically, amputation was the preferred treatment, although limb salvage by Ilizarov technique, vascularized fibular graft, and acute limb shortening were also used. The treatment regimes were long, burdensome and patient unfriendly involving multiple procedures and complications. Masquelet described the technique of antibiotic cement spacer following debridement for an induced bio-membrane, with subsequent bonegrafting within this space. However, similar results were not reported at multiple centers due to damage to the biomembrane while removal of the cement. Hence, the present study describes the technique of cementation and cement retrieval in order to prevent the damage of the bio-membrane. Objective: To study the outcome of the role of modified "Masquelet technique" in the management of long bone defects following trauma presenting at our centre. Method: 9 patients with mean bone defect length of 9.2 cm (after debridement) were operated with the modified Masquelet technique. Results: Union was obtained in all of the cases; the average time for bony union was 8 months since first presentation, with mean follow up of 1 year. Conclusion: The technique of delayed bone grafting with definitive fixation after initial debridement and placement of a cement spacer provides excellent results for patients with large bone segment loss.

Abstract no.: 48004 TREATMENT OF TIBIAL SHAFT FRACTURE BY CLOSE REDUCTION AND INTERNAL FIXATION (CRIF) WITH INTER LOCKING NAIL (ILN) WITHOUT HELP OF IMAGE (C-ARM OR X-RAY). Md.Myen Uddin MOZUMDER¹, Arunava CHOWDHURY¹, Mohammad

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Introduction: Treatment of tibial shaft fracture with ILN under C-Arm is a well accepted procedure. But C-Arm is not always available in many developing countries like Bangladesh. Method: 106 cases of tibial shaft fracture were treated in Chittagong General Hospital within the period of 2012 to 2016 with ILN without any help from C-arm or other image. 40 patients were AO type 42-A, 56 were AO type 42-B and 10 patients AO type 42-C. At first closed reduction was done by manual traction and reduction was confirmed by palpating the tibial crest and the anteromedial surface. Then guide wire was passed through and confirmed by the characteristic sound produced by guide wire striking on tibial plafond. Distal locking was performed first and screw insertion was confirmed by guide wire. Result: Guide Wire Passing- 48 cases guide wire passed through successfully on 1st attempt. 38 cases required 2-4 attempt and 17 cases required 5+ attempt. In 3 cases required opening of the site to pass the guide wire. Distal Screws- Distal screws were put into with the help of Zig (Insertion handle). 86 cases successful on 1st attempt and 20 cases required multiple attempts and help of 3 mm k-wire. Proximal Screws- All attempts were successful with the help of Zig. Conclusion: In developing countries, where C-Arm is not available, closed reduction and internal fixation of fracture shaft of Tibia with Interlocking Nail can be performed by a skilled professional without the help of image. Keywords: Tibial shaft fracture, Interlocking Nail, C-Arm.

Abstract no.: 47885 COMPARISON OF HARDWARE BATTERY DRILL AND ORTHOPEDIC BATTERY DRILL FOR SLIDING HIP SCREW FIXATION IN INTERTROCHANTERIC FRACTURES.

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Introduction: Hardware battery drill (HBD) is commonly used for Orthopedic surgeries in low resource settings. There is no study comparing the HBD to the Standard Orthopedic battery drill (OBD) to recommend or refute its use. Patients and Methods: In this prospective study, 54 patients who were scheduled for sliding hip screw fixation (SHS) for intertrochanteric (IT) fracture were alternatively assigned to either HBD group or OBD group. In both groups, the surgical technique, the operation room, the surgeon and the instrument implant system used were same. Surgeries were carried out in HBD group by using Bosch battery drill and OBD group by Stryker system 5 battery drill. The following factors were compared: surgical duration, drill related incidents during surgery, surgeon comfort, postoperative wound healing and fracture healing time. Results: There was no statistically significant difference in time duration between the usage of two drills. No patient had wound healing problems in either group. All fractures in both groups united. Surgeon comfort level was same with both the drill systems. There were 2 incidences of drill malfunctioning with OBD group and none in HBD group. Conclusion: Hardware battery drill is a viable alternative to standard orthopedic drills especially in low resource settings. The utility and efficacy of HBD was comparable to OBD. The HBD do not have cannulated option for reaming over a long guide wire. HBD cannot be sterilized with autoclave, but with formalin chamber and or ETO.

Abstract no.: 47778 DEVELOPING A TRAUMA SERVICE - CHALLENGES AND TIPS Ivan GEROV¹, Nikolai UZUNOV² ¹UNI Hospital - Panagyurishte, SOFIA (BULGARIA), ²UNI Hospital -Panagyurishte, Panagyurishte (BULGARIA)

Material: Newly established general hospital in a rural community, with over 100000 population, mostly involved in farming, light textile industry and open mining. No prior orthopedic hospital service. Method: Creation of strategic vision and mapping of the medical needs through analysis of the demographics, incidence of various orthopedic and skeletal trauma events. Estimation of orthopedic beds needed per 100000 population followed. Design of the assessment, admission, treatment, discharge and follow-up protocols and criteria was completed. A team of surgeons, nursing staff and porters was recruited. Surgical theater with X-ray capability and appropriate equipment and instrumentation was the next step in the planning process. Smooth interaction with other relevant hospital facilities was provided through the implementation of a web-based hospital information system. It was designed to fully trace the patient hospital stay, to provide feedback upon various search criteria, to generate documents, to make requests for tests and imaging, to store and display results, to calculate the cost of the hospital stay, including both hostel service and medical costs - medications, implants, tests, consultations. Services provided are covering general skeletal acute trauma in adults and children, management of complications of fractures, elective soft tissue knee and shoulder reconstruction, joint replacement, foot and ankle surgery, arthroscopically assisted surgery, bone tumor surgery. Results: In 12 months there is a steady growth in both the demand and the provision of the trauma service. Contacts with local authorities, representatives and generic companies is vital for the success of such venture in a developing country.

Abstract no.: 46977 TRADITIONAL METHODS OF CONSERVATIVE MANAGEMENT OF FRACTURES AS HURDLE IN PROVIDING Α COMPLETE FUNCTIONALITY TO THE PATIENT IN THE DEVELOPING WORLD Anmol Shiv ARORA¹, Manish Kumar SHARMA¹, Samrat SMRUTIRANJAN SAHOO², Sunil Kumar DASH¹, Manoj MADINI¹, Saswat SAMANT¹, Sanket MISHRA¹. Lalit DAS¹ ¹hi tech medical college, Bhubaneshwar (INDIA), ²AIIMS, Bhubaneshwar

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Introduction: In management of fractures as a surgeon the only thing to do is to maintain the alignment and biology of the bone at the fracture site and give the bone its potentiality to unite. The alignment can be maintained either conservatively or surgically but it requires application of scientific knowledge and a good version with anatomy and biology of the bone. Although conservative management of fractures is an age old procedure, but the continuation of traditional ways of management of the fractures conservatively is becoming major hurdles to us as orthopaedic surgeons as we come across most of the non-union, mal-union, pseudo-arthrosis in those who are managed conservatively in traditional manner. It is not only a problem to the surgeon but also becoming a major hurdle for the patient to get proper scientific management and attaining functionality in time. Methods: In our study during the time period of 1 year, we have come across 16 non-unions (5 femur shaft, 6 neck of femur, 2 tibia, 3 humerus), 11 mal-unions (5 trochanter, 3 distal femur, 3 proximal tibia). In our cases we did freshening of edges, bone grafting, and correction of deformity. For this both the patients and the surgeons faced the risk of those procedures which could have been avoided. Conclusion: As surgeons not only we have to treat the patients but also create awareness among patients to accept scientific methods of management of fracture to attain functionality in time to avoid secondary procedures and complications associated with it.