Conclusion: Given the poor outcomes associated with chronic opioid use, these findings may provide insights into risk factors for persistent chronic opioid use following THA. In our study, male gender, ASA score >2, and Medicare as a payer type were associated with a higher likelihood of persistent-chronic opioid use. A higher morphine-equivalent dose consumption prior to surgery was most predictive for persistent chronic opioid use.

Methods: A retrospective analysis was performed on 266 THA recipients using the state’s mandated opioid monitoring program to identify preoperative chronic opioid users. Chronic users were stratified into two cohorts based on their use 6 months after surgery: 1) persistent-chronic, and 2) previous chronic users. Patient demographics and relevant histories were abstracted and comparatively assessed between the cohorts. In addition, an analysis was performed to calculate the prevalence of opioid overdose deaths, which is a measure of persistent chronic opioid use.

Results: Within the study population, 54 patients were identified as preoperative chronic opioid users. Of these, 13 (24.1%) were identified as persistent-chronic users 6 months following surgery. Specific characteristics associated with a higher likelihood of persistent-chronic opioid use included: male gender, ASA score >2, and Medicare as a payer type. A 33 mg/day morphine-equivalent dose consumption prior to surgery was most predictive for persistent chronic opioid use.

Conclusion: Our study demonstrates that patients who are male, have an ASA >2, and use Medicare are at greater risk for persistent chronic opioid use. Thus, given the poor outcomes associated with chronic opioid use, these findings may help guide surgeons’ clinical decision-making process when encountering patients with a history of opioid use.

P01 Complex primary THA
P01-305
RISK FACTORS ASSOCIATED WITH PERSISTENT CHRONIC OPIOID USE FOLLOWING THA
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Introduction/objectives: An understanding of patient characteristics associated with persistent-chronic opioid use after total joint arthroplasty (TJA) will allow surgeons to better manage these patients. Our study aims to risk factors among preoperative chronic opioid users who continue to chronically use narcotics after total hip arthroplasty (THA).

Methods: A retrospective analysis was performed on 266 THA recipients using the state’s mandated opioid monitoring program to identify preoperative chronic opioid users. Chronic users were stratified into two cohorts based on their use 6 months after surgery: 1) persistent-chronic, and 2) previous chronic users. Patient demographics and relevant histories were abstracted and comparatively assessed between the cohorts. In addition, an analysis was performed to calculate the prevalence of opioid overdose deaths, which is a measure of persistent chronic opioid use.

Results: Within the study population, 54 patients were identified as preoperative chronic opioid users. Of these, 13 (24.1%) were identified as persistent-chronic users 6 months following surgery. Specific characteristics associated with a higher likelihood of persistent-chronic opioid use included: male gender, ASA score >2, and Medicare as a payer type. A 33 mg/day morphine-equivalent dose consumption prior to surgery was most predictive for persistent chronic opioid use.

Conclusion: Our study demonstrates that patients who are male, have an ASA >2, and use Medicare are at greater risk for persistent chronic opioid use. Thus, given the poor outcomes associated with chronic opioid use, these findings may help guide surgeons’ clinical decision-making process when encountering patients with a history of opioid use.

P01 Complex primary THA
P01-431
THE ROOF STEP CUT TECHNIQUE FOR COTYLODONTIA IN HIP OA SECONDARY TO DYSPLASIA
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Introduction/objectives: Developmental dysplasia of the hip (DDH) is one of the most common causes of secondary osteoarthritis in early adulthood. The femoral head is partially or fully uncovered, the rotational center is displaced laterally and cranially. According to the literature the question of cup positioning during THA is still unresolved for many surgeons. In our belief we have to do our best to restore the primary rotational center.

Methods: The aim of this study was to assess the long-term performance of tapered one-third proximally coated stems in Crowe type II and III dysplastic hips.

Methods: This study included 136 dysplastic patients (150 hips) who underwent a total hip arthroplasty and had a minimum follow-up of ten years. Single design tapered stems were used in all patients. There were 112 women (83%) and 23 men (17%) with a mean age of 56 years (23 to 72) at the time of surgery. The mean follow-up was 14.7 years (10 to 16.8). For clinical evaluation, the Harris Hip Score and Merle D’Aubigne scale were used preoperatively and at the final follow-up. Implant survival was calculated using Kaplan-Meier survivorship analysis, with failure defined as a component revision for any reason.

Results: Overall, one stem was revised for a deep infection. There were no other femoral stem revisions secondary to loosening, wear, periprosthetic fracture or instability. Radiographic evaluation showed excellent stem ostéointegration in all cases. Kaplan-Meier survivorship, with stem revision for any reason as the end point, was 98% at 14 years (95% confidence interval 92.5 to 99.8).

Conclusion: This study demonstrates that a dual offset tapered stem achieved excellent survivorship and stability, as well as good clinical outcome scores with minimal thigh pain and stress shielding in patients with arthritis and developmental dysplasia of the hip; a dual offset tapered stem may be a suitable option for primary total hip arthroplasty in this group.

P101-444
DUAL OFFSET METAPHYSEAL-FILLING STEMS IN PRIMARY TOTAL HIP ARTHROPLASTY IN DYSPLASTIC HIPS AFTER A MINIMUM FOLLOW-UP OF 10 YEARS
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Introduction/objectives: The aim of this study was to assess the long-term performance of tapered one-third proximally coated stems in Crowe type II and III dysplastic hips.

Methods: This study included 136 dysplastic patients (150 hips) who underwent a total hip arthroplasty and had a minimum follow-up of ten years. Single design tapered stems were used in all patients. There were 112 women (83%) and 23 men (17%) with a mean age of 56 years (23 to 72) at the time of surgery. The mean follow-up was 14.7 years (10 to 16.8). For clinical evaluation, the Harris Hip Score and Merle D’Aubigne scale were used preoperatively and at the final follow-up. Implant survival was calculated using Kaplan-Meier survivorship analysis, with failure defined as a component revision for any reason.

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Conclusion: This study demonstrates that a dual offset tapered stem achieved excellent survivorship and stability, as well as good clinical outcome scores with minimal thigh pain and stress shielding in patients with arthritis and developmental dysplasia of the hip; a dual offset tapered stem may be a suitable option for primary total hip arthroplasty in this group.

P01 Complex primary THA
P01-405
ALLOPLASTIC RECONSTRUCTION OF LIGAMENTUM TERES FEMORIS IN UNIPOLAR HIP ARTHROPLASTY
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Introduction/objectives: Unipolar hip arthroplasty with prostheses head made of metal or polymer (Moor type) is commonly used in senior patients. One of its complications is dislocation (5-25 % cases). It is caused, in our opinion, by changing physiological biomechanics in hip joint as a result of cutting the ligamentum teres femoris. The aim was to evaluate the benefits of the ligamentum teres femoris reconstruction in unipolar hip arthroplasty.

Methods: The aim of developed technique is that the Moor type prosthesis is fixed in the acetabulum and in the femoral bone with an artificial ligament guided through the canal in the head, neck of the prosthesis and proximal end of femoral bone. It is fixed on one side in the acetabulum and on the other side in subchondral region. The ligament contain dumbbell-shaped stop, which is placed in pelvic cavity through a hole made in the acetabulum fossa. Prosthesis head, neck and stop are made of brimmed polymer polyamide-12, stem is made of titanium alloy. The technique was used in 17 patients (8 men, 9 women, average age 77.3). There were 15 patients with acute subcapital neck fractures, 2 patients with femoral neck pseudoarthrosis.

Results: All patients successfully underwent surgery. Active motion exercises in the joint were started next day after surgery. Patients were allowed to sit up in bed and walk with crutches partially weight-bearing operated limb. Results were followed-up in 16 patients for up to 7 years. There were no cases of instability or dislocation of prosthesis.

Conclusion: Reconstruction of ligamentum teres femoris in unipolar hip arthroplasty restores normal biomechanics in hip joint, prevents dislocations, facilitates rehabilitation in elderly and senior patients, and provides positive medical-social effect.
Introduction/objectives: Failure mechanisms following reduction and fixation of intertrochanteric hip fractures (IHF) with a cephalomedullary nail (CMN) may include device penetration into the joint, avascular necrosis, secondary osteoarthrosis and non- or mal-union. The purpose of this study was to evaluate the clinical results of conversion total hip arthroplasty (CTHA) following failed CMN in the treatment of IHFs.

Methods: Twenty-eight patients (17 female) requiring CTHA for the treatment for failed IHF between 2013 and 2016 were retrospectively reviewed. Thirteen were proximal femoral nails (PFN), 9 trochanteric femoral nails (TFN), and 6 Gamma nails. Average age at failure was 72.7 years (range 56.81), and mean time from index surgery to CTHA was 14 months (range 7-20 months). Revisions consisted of 24 uncemented cups (86%) and 4 cemented acetabular components. Bone graft was used in 6 cases due to laminar nail protrusion. In 22 cases, a cementless distally-fixed modular stem was used; and in 5, a cemented stem was necessary due to the absence of an acceptable press-fit.

Results: Average preoperative HHS was 41 (range 37-51) and increased to 86 (range 76-92) at most recent follow-up. Complications included adductor deficiency in 10 patients requiring assistive walking aid. We found 2 cases of dislocation treated with closed reduction, 1 surgical site infection treated with irrigation and debridement and 1 aseptic loosening treated with revision surgery.

Conclusion: CTHA is a viable rescue method for osteosynthesis failure following intertrochanteric fractures. However, a higher complication rate may be expected with this treatment.

Introduction/objectives: There were no differences in total number days of admission. In both groups was found an average of 7 days. The death surgical risk ASA-III. 60% of patients in the ASA IV group presented postoperative complications Vs 20% of ASA-III group.

Results: A total of 10 patients were classified preoperatively with an ASA-IV surgical risk compared to 30 patients with an ASA-III. The average follow-up was 49.9 (range: 22-68) years. The surgeries were performed in between 2007-2012. Patients were treated with revision surgery. Total hip replacement was a challenging task in patients with neuromuscular abnormality who are susceptible to higher complication rate may be expected with this treatment.

Conclusion: Hip arthroplasty with transverse shortening femoral osteotomy with S-ROM stem is sufficient treatment method in patients with Crowe type IV dysplasia in mid-term.
LEGG-CALVÉ-PERTHES DISEASE CAN LEAD TO ACETABULAR RETROVERSION

Introduction/objectives: Legg-Calvé-Perthes disease (LCPD) is a childhood hip disorder that typically leads to a femoral head deformation with an increased risk of osteoarthritis. It is unknown if acetabular version is affected by the disease. In patients with Hartofylakidis type II and III DDH who underwent cemented THA with low offset small cemented Exeter stem +/- shortening osteotomy.

Methods: Data were extracted for the Arthroplasty Registry Thessaloniki. 40 patients suffering from Hartofylakidis type II / III DDH managed with a low offset (30, 30.5 and 35.5) Exeter cemented stem between 2010 and 2017 were included. In all type II Hartofylakidis dysplasia shortening dental osteotomy was also accomplished. An un cemented Trident™ stem with screws was used for the cup reconstruction, augmented either with figure of seven or with deepening of the socket.

Results: The mean age of patients was 41.5 years. The mean duration of follow up was 5.2 years. 33 hips presented type II, while 7 type III Hartofylakidis dysplasia. The acetabular version occurred in all patients with type III dysplasia. The mean Harris hip score improved significantly at the last follow up (p<0.001). There was an early dislocation managed with a revision to a constrained liner and a temporary sacral nerve paraplegia postoperatively. Two hips showed osteolysis in Gruen zone 1 and 2 hips showed osteolysis in zone 1 and 7. No implants were revised, and no signs of component loosening and stem subsidence were observed at the last follow-up visit. The survival rate was 100% at 5 years with revision to acetopic loosening as the endpoint.

Conclusion: The short offset Exeter stem +/- subtrochanteric shortening osteotomy in THA for patients with Hartofylakidis type II and III DDH had good clinical results with small risk of complications. The short offset Exeter stems are a safe, durable and good solution for the balance of DDH deformity.

TOTAL HIP ARTHROPLASTY IN SICKLE CELL ANAEMIA AND ITS CHALLENGES

Introduction/objectives: Sickle cell disease is a condition more prevalent in Africans. Patients with this condition are at increased risk for developing avascular osteonecrosis (AVN) of the femoral head and early secondary hip osteoarthritis. Total hip arthroplasty (THA) is frequently indicated for treatment but procedural challenges and perioperative complications can make these cases difficult. We report a case of THA in a patient with sickle cell disease and secondary proximal femur osteonecrosis due to osteosclerosis, show difficulties and how to avoid complications.

Methods: Clinical history, physical exam, interpretation of complementary diagnostic tests and bibliographic review.

Results: We present a case report of an African 37 years old female who developed proximal femoral AVN and was submitted to cementless THA. Pre-operatively X ray showed FICAT IV AVN and a Don A femoral canal. Flexible guided reamers were requested for the surgery. Intra-operatively we identified metaplastic bone sclerosis with femoral canal obliteration. Drilling of the femoral canal under image control was necessary to advance guide wire for flexible reamers. There was metaphyseal perforation A1, filled with bone graft and cementless THA was performed. Patient developed acute hemolytic anemia in the post op period with multiple transfusions needed. There was no other complication in the post op. At 1 y of follow up patient is ambulatory and satisfied with hers THA.

Conclusion: The mid-term functional and radiological results of THA in patients with Hartofylakidis type II and III DDH who underwent cemented THA with low offset small cemented Exeter stem +/- shortening osteotomy.

TOTAL HIP ARTHROPLASTY AFTER TRANSROCHANTERIC ROTATIONAL OSTEOTOMY FOR OSTEONECROSIS OF THE FEMORAL HEAD: EVALUATED WITH ADIPOGRAPHY AND COMPUTERIZED TOMOGRAPHY

Introduction/objectives: Few reports using computed tomography (CT) are available regarding the study of total hip arthroplasty (THA) after transrochanteric rotational osteotomy (TRO) for osteonecrosis of the femoral head (ONFH). The purpose of this study was to compare the outcome of THA after TRO for ONFH with that of primary THA using radiographs and CT.

Methods: We retrospectively reviewed twelve hips in 12 patients who underwent THA after TRO for ONFH (post osteotomy group) and compared them with thirteen hips in 12 patients who underwent primary THA (primary group) during the same period. We used the same design of cementless implant. All patients were followed for at least 2 years (mean 3.6 years, range 2.5 - 6.5 years) after THA. A clinical assessment was performed preoperatively and at the latest follow up using Japan Orthopaedic Association Hip Scores (JHA Hip Scores). A radiographic examination was performed after THA and at the latest follow up. Contrast-enhanced CT was performed 1 week after THA in order to identify various thrombomobilization. Data were analyzed appropriately using the Wilcoxon test, the Mann-Whitney U test and the chi-square test. P < .05 was considered statistically significant.

Results: JOA Hip Score improved significantly at the latest follow up over the preoperative value in both groups. No significant differences were observed in complications between the two. However, from the CT scan, we found that the cup antversion angle was lower (P = 0.048) and the stem antversion angle was higher (P = 0.0496) in the post osteotomy group than in the primary group.

Conclusion: The present study reveals the effectiveness of CT in assessing THA after TRO for ONFH.

TOTAL HIP ARTHROPLASTY AFTER TRANSROCHANTERIC ROTATIONAL OSTEOTOMY FOR OSTEONECROSIS OF THE FEMORAL HEAD: EVALUATED WITH ADIPOGRAPHY AND COMPUTERIZED TOMOGRAPHY
Introduction/objectives: Hip arthroplasty in patients with haemophilia is not as common as knee, elbow and ankle arthroplasty. However, and stage arthroplasty of the hip needs total hip arthroplasty (THA) in these patients. THA in patients with haemophilia is associated with higher incidence of complications including blood loss. We conceive this study to see if using direct anterior (DA) approach for THA in patient with haemophilia could affect complications especially blood loss.

Methods: In our prospective institutional database, we identified 13 patients who underwent THA through DA approach between January 2011 to January 2016. 12 out of 13 patients had severe hemophilia A (<1% Factor VIII) and one had severe hemophilia B (<1% factor IX). One patient (two hips) had high titre on inhibition. Cementsless prosthesis (cup and stem) were inserted via DA approach in all patients.

Results: we had 13 male patients and 15 hips (two simultaneous bilateral patients) who were followed-up for 36 months (range, 12 to 74). The average blood loss was 550cc (300-850cc). Mean operation time was 65min (55-85min). we had no serious complications such as hematoma, deep vein thrombosis (DVT) or infection. Only one patient needed blood transfusion. The mean Harris Hip Score improved from 46 (range,34-53) to 83 (range, 50-97) (p<0.05)

Conclusion: DA approach is a viable option for patient with bleeding tendency in terms of reducing blood loss and subsequent complications. It needs to be done by surgeons who have already passed their learning curve for this approach.
Introduction/objectives: Untreated patients with DDH have a higher incidence of hip osteoarthritis which causes severe functional impairment. The complexity of THA in DDH patients is due to pathomorphologic changes of the acetabulum and femoral-ROF modular system provides the surgeon with the ability to independently adjust femoral neck offset, femoral neck-shaft angle and the version angle of the femoral neck. The authors present long-term results of modular system THA in DDH patients.

Methods: A retrospective transversal study included DDH patients who underwent THA using a modular system between January 2000 and December 2010. Two of these patients were lost in follow-up. Cualme classification was used for DDH categorization. The authors present the preferred procedure, histological pair, implant sizes, acetabulum positioning, complications.

Results: The study focuses on 20 hips of 18 DDH patients. The mean follow-up was 93.14 months. The mean age was 37.8 years. 13 female patients and 5 male patients. Crowe classification: 4 cases type II, 6 cases type III and 10 cases type IV. Metal/polietilene was the most commonly used tribological pair. The head size varied between 22, 28, 32 and 36.

Conclusion: THA in DDH patients is a challenge procedure with good functional outcome and low revision rate. The modular THA system represents a good solution in DDH patients.

P01 Complex primary THA

P01-353
TOTAL HIP ARTHROPLASTY WITH S-ROM MODULAR SYSTEM IN PATIENTS WITH DEVELOPMENTAL DYSPLASIA OF THE HIP - 10 YEARS RETROSPECTIVE STUDY

Introduction/objectives: Five-year results after cementless total hip arthroplasty for dysplastic femurs in Japanese patients.

Methods: A retrospective study included 44 patients (31 males, 13 females) with failed IF of previous femoral neck fractures (FNF). The age of the patients averaged 36.3±16.1 years. The etiology of the failure included avascular necrosis (AVN) in 11 patients, fracture collapse in 29 patients, nonunion in 9 patients and nail cut-out or screw breakage with acetabular abutment in 6 patients. Patients were followed for 5.9±3.5 years.

Results: Two patients had died and 5 were lost due to the changing of the contact information. Intraoperative femoral fractures occurred in 1 patient. There was no patient with dislocation, deep venous thrombosis and pulmonary embolism. Heterotopic ossification was found in 2 patients. Three patients had developed superficial infection of the surgical wound and were treated with oral antibiotic therapy. Thirty seven patients returned for last visit. Five patients complained of mild to severe pain and required analgesics. Three patients could not ambulate without crutches. Harris hip score averaged 86.7±15.2.

Conclusion: Our findings confirm that THA is an effective and safe salvage procedure for patients with failed IF of FNF and results in satisfactory functional and clinical outcomes.

P01-454
TOTAL HIP ARTHROPLASTY FOLLOWING FAILED INTERNAL FIXATION OF THE PROXIMAL FEMORAL FRACTURES

Introduction/objectives: Despite good outcomes of internal fixation (IF) following hip fractures, some patients experience failure of IF due to several causes. These problems lead to severe pain and disability and necessitate revision surgery. Salvage treatment with total hip arthroplasty (THA) can be considered. In current study, we aimed to investigate the midterm clinical and functional outcomes and incidence of complications of THA for patients with failed IF of proximal femoral fractures.

Methods: Between 2004 and 2010, there were 44 patients (31 males, 13 females) with failed IF of previous femoral neck fractures (FNF). The age of the patients averaged 36.3±16.1 years. The etiology of the failure included avascular necrosis with collapse in 29 patients, nonunion in 9 patients and nail cut-out or screw breakage with acetabular abutment in 6 patients. Patients were followed for 5.9±3.5 years.

Results: Two patients had died and 5 were lost due to the changing of the contact information. Intraoperative femoral fractures occurred in 1 patient. There was no patient with dislocation, deep venous thrombosis and pulmonary embolism. Heterotopic ossification was found in 2 patients. Three patients had developed superficial infection of the surgical wound and were treated with oral antibiotic therapy. Thirty seven patients returned for last visit. Five patients complained of mild to severe pain and required analgesics. Three patients could not ambulate without crutches. Harris hip score averaged 86.7±15.2.

Conclusion: Our findings confirm that THA is an effective and safe salvage procedure for patients with failed IF of FNF and results in satisfactory functional and clinical outcomes.
P01 Complex primary THA

P01-387
IS ONE-STAGE BILATERAL TOTAL HIP ARTHROPLASTY A SAFE PROCEDURE FOR PATIENTS WITH AVASCULAR NECROSIS OF FEMORAL HEAD?

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Introduction/objectives: Some surgeons are concerned about safety of stage bilateral total hip arthroplasty (BTHA). In current study, the outcomes and complications of one-stage BTHA through Harding approach was investigated in patients with aneurysmal necrosis of femoral head.

Methods: There were 72 patients with bilateral AVN of femoral head enrolled in current prospective study. The patients aged 52.3±6.2 years. All of the patients underwent one-stage BTHA. Beside of clinical and radiological evaluations, modified Harris Hip Score (MHS) was completed for all of the patients, preoperatively and again postoperatively.

Results: The mean operational time and hospital stay was 2.5±0.2 hrs and 3.7±1 days, respectively. After the operation Hemoglobin level decreased significantly (13.2±4.1 mg/dL Vs 8.2±2.7 mg/dL; p<0.001). There was no deep venous thrombosis, pulmonary embolism, infection, dislocation and periprosthetic fracture in our study. One patient developed unilateral heterotrophic ossification. The MHS increased significantly from 45.7±10.2 preoperatively to 59±12.6 postoperatively (P<0.001).

Conclusion: Based the findings of current study, one-stage BTHA through Harding approach is a safe and useful treatment for patients with femoral head avascular necrosis. However, long term studies are necessary.

P01 Complex primary THA

P01-451
TOTAL HIP ARTHROPLASTY IN ASSOCIATION WITH DIGASTRIC TROCHANTERIC OSTEOTOMY AND PROXIMAL SHORTENING: A SOLUTION FOR OLD HIP DYSPLASIA

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Introduction/objectives: Symptomatic secondary arthritis is a major at a relatively young age and their treatment is total hip arthroplasty which has a broad spectrum of technical challenges. The purpose of this study is to evaluate the outcomes of cementless THA in patients with severe DDH with a special focus on the results of a unique procedure.

Methods: A total 102 patients with Crowe type IV dysplasia underwent cementless total hip arthroplasty (THA) with digastic osteotomy and femoral shortening from February 2009 to March 2014, Tehran, Iran. A prospective analysis of the outcomes of THA was performed. 92 female (90.19%) and 10 male (9.80%) with a mean age of 33.17±12.12 years (range 30 to 40 years) were enrolled. All patients were evaluated clinically and radiologically with serial follow-ups to obtain the possible complications.

Results: The mean modified Harris hip score improved from 44 (range: 32 to 56) preoperatively to 80 (range: 76 to 93) at final follow-up, significantly (P<0.0001). At the last follow up none of patients have pain and in radiography, there was no osteolytic lesion, no presence of lucent line, trochanteric non-union, and change in inclination. All of patients had good activity at the last follow up. We reported 7 (6.85%) complications in patients; 3 sciatic nerve palsy, 2 dislocations after falling, one intra-operative femoral fracture and one intra-pelvic cup migration.

Conclusion: Cementless total hip arthroplasty using the digastic trochanteric osteotomy and proximal shortening demonstrated excellent short- to medium outcomes in most of Crowe type IV hip dislocations and it is recommended for these subjects.

P01 Complex primary THA

P01-458
TOTAL HIP ARTHROPLASTY: A SOLUTION FOR PREVIOUSLY FUSED HIP

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Introduction/objectives: Total hip arthroplasty in previously fused hip is a challenging procedure recently performed. In our previous experiences, the procedure was successful in limited number of patients. In current study, we investigated the outcomes of THA in more patients with a fused hip.

Methods: There were 33 patients with previous hip fusion. The patients aged about 28 years at the time of arthrodesis and 52.3 years at the time of THA. The chief complaint was severe LBP in 9 patients, severe ipsilateral knee pain in 14 patients and both in 10 patients. All of the surgeries were performed by the same surgeon (A.T.). The patients were followed for 2 years.

Results: At the final visit, 27 patients were pain free or experienced mild pain (84%). In these patients the pain intensity decreased from 7.3±2 to 1.4±1 using visual analog scale (VAS). Harris hip score (50±14 Vs 82±6) and Oxford hip score (33±18 Vs 19±7) improved significantly after the operation (p<0.001). Four of the remaining patients had severe pain and two others needed assistive devices for ambulation. 2 patients developed heterotrophic ossification. Furthermore, common fibular nerve paresis developed in 4 patients which recovered after 3 months in all of them. Four patients were ambulant with limping.

Conclusion: Considerable pain relief can be achieved in patients with fused hip using THA. In addition, the functional status significantly improved. However, the procedure is technically demanding and some complications are possible. Furthermore, THA may be helpful for some cases as expected.

P01 Complex primary THA

P01-348
FLUOROSCOPY GUIDED RESURFACING HIP ARTHROPLASTY IN PATIENTS WITH OSTEOSYNTHESIS PLATES

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Introduction/objectives: Secondary hip osteoarthritis in patients with a previous osteosynthesis of the proximal femur is a frequent situation. Recommended steps in the case a total hip arthroplasty (THA) needs to be performed are: first, plate removal and then, if the bone quality is adequate, THA

Methods: We present 3 patients with a previous proximal femoral osteosynthesis plate and severe hip osteoarthritids that were treated with a fluoroscopy-guided resurfacing arthroplasty.

Description of Technique: A threaded guide pin was located percutaneously in the anteroposterior and lateral plane using fluoroscopy. The pin guide was driven through the lateral cortex into the center of the femoral neck in both coronal and sagittal planes. The patient was then located in the lateral decubitus position, and was operated through a posterior/lateral approach, finding the pin guide after dislocation. Routine cannulated instruments and the implant guidelines were used as described for the original surgical technique.

Results: At a minimum follow up of 7 years, no femoral neck fractures were observed, and no other complications were related to this procedures.

Conclusion: Fluoroscopy guided resurfacing arthroplasty is a valid option to treat patients presenting with a previous proximal femoral osteosynthesis plate, thus avoiding the need for plate removal, a long term or a staged procedure.
P01 Complex primary THA

P01-115

CHOICE OF ACETABULAR CUP IN TOTAL HIP REPLACEMENT SURGERY DUE TO ADULT CONGENITAL HIP DISEASE

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Introduction/objectives: To analyze the possibilities of cementless acetabular cup in the reconstruction of the hip joint with Congenital Hip Disease (CHD).

Methods: Survey period 2001-13 y. 105 cases are available for retrospective follow-up. They are extracted from our database (Microsoft Access 2010) and evaluated with our software product. hip calculator for X-ray positioning of the cup. These type cementsless acetabular cups are used. 1. Hemispheric monoblock press-fit; 2. Modular hemispheric press-fit; 3. Modular trapezoidal screwing cup. Operative technique: Medial protection (MPT) for insertion of the cementsless cup. Used statistical methods: 1. meta-analysis to compare with cement cups (in literature review). 2. ANOVA; 3. Kaplan-Meier survivorship analysis, with an end point-revision of the implant due to aseptic loosening and migration.

Results: Demonstrating excellent survival of the implant - for a Follow Up period at 10 years only 2 cases are revised due to aseptic loosening and migration of the cup.

Conclusion: Cementless acetabular cups works successfully in THA due to CHD. It is implant of choice in modern approach for endoprosthetic replacement of the hip with CHD.

P01 Complex primary THA

P01-116

ADVANTAGES OF THE POSTERIOR APPROACH TO THE HIP JOINT IN ENDOPROSTHETIC REPLACEMENT OF THE DYSPLECTIC HIP ARTHRITIS

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Introduction/objectives: To identify and analyze the advantages of the Posterior (PL) versus direct gluteal (DG) in cases of THA due to dysplastic hip OA.

Methods: Follow Up period: 2001-15 y. THA via PL approach-42 cs; via DG-63 cs. Main surgical technique for acetabular reconstruction: medial protonation (MPT). In cases with high riding OA: femoral subtroch. shortening was performed. Formed two groups of patients were subjected to statistical analysis (SPSS-10) and compared on following indications: 1. Global functionality (Harris Hip Score HHS); 2. Trendelenburg post-early and late. 3. Early complications: intraop. Fr, inability to secure the cup, neural damage.4. Late complications: instability- dislocations; neural damages; heterotopic ossification(HO). Surgical technique in terms of the surgical approach to be used was analyzed.

Results: 1. Regarding surgical technique- benefits are accounted in the correct finding the important landmark- tuber ischi. better visual control over the reaming process, better damage control over the surrounding soft tissue envelope. 2. Regarding functionality- advantages in order to avoid late Trendelenburg. 3. Complications- early and late - no statistically significant difference between DG and PL approaches available.

Conclusion: PL approach is approach of choice of THA in cases due to dysplastic OA, especially in complex reconstruction via subtroch-femoral shortening osteotomy.
P01 Complex primary THA

P01-28
UNCONSTRAINED PRIMARY TOTAL HIP ARTHROPLASTY IN GROSS MOTOR LEVEL 3-4 CEREBRAL PALSY PATIENTS

Introduction/objectives: Primary total hip arthroplasty (THA) has already been described in patients with cerebral palsy (CP). However, little has been reported when such patients are moderately to severely affected by this pathology. We aimed to describe the mid-term clinical and radiological outcome of dysplastic CP patients treated with unconstrained THA.

Methods: We retrospectively analysed 9 patients with dysplastic CP; 4/9 due to CP treated with primary THA between 2006-2014. We excluded 1 case with less than 1-year follow-up and 1 case with Gross Motor Function Classification System (GMFCS) level 4. All the 7 cases included, 4 were GMFCS level 3 and 3, GMFCS level 4. Mean follow-up was 31 months (minimum, 26). Clinical outcome was evaluated with the modified Harris Hip Score (mHHS) and the visual analog scale (VAS) pain score. Radiographs were examined to identify the cause of complications and the need for revision surgery.

Results: All patients showed significantly better functional results when preoperative and postoperative mHHS (42.5 vs. 72.5, respectively; p=0.002) and VAS pain score (4.66 vs. 1, respectively; p=0.0005) were compared. Two cases presented with an acute peri-prosthetic infection, of which 1 underwent a 2-stage protocol. All final follow-up, 1 asymptomatic case had signs of femoral loosening; thus, it was conservatively treated. Two cases showed Brooker type 2 heterotopic calcifications that were also conservatively treated. We found no cases of instability.

Conclusion: In patients with moderate and severe CP, unconstrained THA showed acceptable clinical outcomes with a marked reduction in pain and without instability. However, potential complications such as infection, loosening and heterotopic calcifications may be more frequent in this population.

P02 Dual mobility cups

P02-180
DUAL MOBILITY TOTAL HIP ARTHROPLASTY FOLLOWING FAILED FIXATION OF PROXIMAL FEMORAL FRACTURE

Methods: Sixty two patients who had DM THA following failed fixation of proximal femoral fractures were prospectively evaluated. The mean follow up was 39 months and minimum of 2 years. The average age was 62 years (range 49-85 years). 34 of these fractures were sub-capital fractures and 26 in the trochanteric area. The underlying etiologies were non-union, secondary arthritis, avascular necrosis, fatigue failure or backing out of metal work and infection. In presence of infection, staged arthroplasty with an interim period of antibiotic loaded cement spacer before implantation of the definitive DM prostheses was performed in 11 hips. 9 hips were evaluated at 3 and 12 months and annually thereafter. The Harris Hip Score (HHS) was employed for evaluation.

Results: 8 patients had died after the first year leaving 57 for the final evaluation. Cementless DM cups were implanted in 32 patients while cemented were employed in 30. Independent mobilization without aid was achieved in 38 patients, while 15 were using one crutch, 5 with frame and 4 with frame and one assistant. The mean HHS improved from 25 pre to 92 post (P<0.001). None of the patients had dislocation of the hip. Two patients were re-admitted for drainage of hematoma and one patient had deep vein thrombosis.

Conclusion: DM THA achieves excellent postoperative stability and function even in high risk patients who receive this implant following failure of hip fracture fixation.

P02 Dual mobility cups

P02-52
CEMENTED DUAL MOBILITY CUPS IN ELDERLY PATIENTS

Methods: We retrospectively analysed 9 patients with dysplastic coxarthritis due to CP treated with primary THA between 2006-2014. We excluded 1 case with less than 1-year follow-up and 1 case with Gross Motor Function Classification System (GMFCS) level 4. All the 7 cases included, 4 were GMFCS level 3 and 3, GMFCS level 4. Mean follow-up was 31 months (minimum, 26). Clinical outcome was evaluated with the modified Harris Hip Score (mHHS) and the visual analog scale (VAS) pain score. Radiographs were examined to identify the cause of complications and the need for revision surgery.

Results: All patients showed significantly better functional results when preoperative and postoperative mHHS (42.5 vs. 72.5, respectively; p=0.002) and VAS pain score (4.66 vs. 1, respectively; p=0.0005) were compared. Two cases presented with an acute peri-prosthetic infection, of which 1 underwent a 2-stage protocol. All final follow-up, 1 asymptomatic case had signs of femoral loosening; thus, it was conservatively treated. Two cases showed Brooker type 2 heterotopic calcifications that were also conservatively treated. We found no cases of instability.

Conclusion: In patients with moderate and severe CP, unconstrained THA showed acceptable clinical outcomes with a marked reduction in pain and without instability. However, potential complications such as infection, loosening and heterotopic calcifications may be more frequent in this population.

P02-538
REVISION OF LARGE DIAMETER METAL-ON-METAL THA USING A CUSTOM-MADE DUAL-MOBILITY BEARING

Methods: A consecutive case series using a custom-made DMB. All cases had a Birmingham Resurfacing Cup with a modular Birmingham head used on-label with the same manufacturer stem. After confirmation of LOT codes and a digital measurement of component orientation a compatible custom-made DM head was manufactured and implanted.

Results: 19 cases in 18 patients (one bilateral) with a mean age 74 years (53-86). Pre-op the mean Oxford Hip Score (OHS) was 26 (0-47). All patients had a MARS MRI confirming ARMD. Mean pre-op Co was 13.09ppb (2.58-26.33) & Cr 6.78ppb (2.19-30.18). Implant position (degrees) a mean cup inclination of 43.3 (34.0-55.0) & version 17.4 (2.0-29.8) and stem version 4.7 (0.0-14.5).

At 6 months the OHS was 41 (25-46) & metal ion levels had significantly decreased with Co 3.87ppb (0.56-12.84) and Cr 3.06 (0.95-9.31). At a maximum follow-up of 3.8 years one patient, with complete abductor destruction, had required revision to a constrained liner for dislocation.

Conclusion: This series highlights potential scenarios where the preservation of a well-fixed and orientated socket is beneficial and present least harm. This can be achieved with the use a of a custom-made Dual Mobility Bearing (DMB).

P02-528
REVISION OF LARGE DIAMETER METAL-ON-METAL THA USING A CUSTOM-MADE DUAL-MOBILITY BEARING

Methods: A consecutive case series using a custom-made DMB. All cases had a Birmingham Resurfacing Cup with a modular Birmingham head used on-label with the same manufacturer stem. After confirmation of LOT codes and a digital measurement of component orientation a compatible custom-made DM head was manufactured and implanted.

Results: 19 cases in 18 patients (one bilateral) with a mean age 74 years (53-86). Pre-op the mean Oxford Hip Score (OHS) was 26 (0-47). All patients had a MARS MRI confirming ARMD. Mean pre-op Co was 13.09ppb (2.19-30.35) & Cr 6.78ppb (2.19-30.18). Implant position (degrees) a mean cup inclination of 43.3 (34.0-55.0) & version 17.4 (2.0-29.8) and stem version 4.7 (0.0-14.5).

At 6 months the OHS was 41 (25-46) & metal ion levels had significantly decreased with Co 3.87ppb (0.56-12.84) and Cr 3.06 (0.95-9.31). At a maximum follow-up of 3.8 years one patient, with complete abductor destruction, had required revision to a constrained liner for dislocation.

Conclusion: This series highlights potential scenarios where the preservation of a well-fixed and orientated socket is beneficial. Those being poor bone stock, severe medical co-morbidity and high dislocation risk. Surgical morbidity is beneficial. Those being poor bone stock, severe medical co-morbidity and high dislocation risk. Surgical morbidity is
DMCs. Awareness of these complications will help avoid unnecessary problems for our patients.

Methods: During routine follow up, we observed an asymptomatic patient with an IPD and elevated serum metal ions (cobalt 30.4 nmol/L and chromium 539.0 nmol/L). Revision surgery was inevitable. Perioperative metallosis and severe wear of the metal shell and metal femoral head supported the IPD. Our literature search was performed by the two authors and focused on DMC, IPD and metal wear.

Results: A successful revision of the DMC was performed and serum metal cobalt and chromium decreased rapidly in the following 3 months. The histopathology showed dense histiocytic aggregates which supports tissue reaction to metal.

Discussion: We present a case and show the current literature about this topic to create awareness of this possible destructive problem.

Conclusions: This case presents an asymptomatic and DMC specific complication which led to elevated serum metal ions, metallosis and revision surgery. Our case and review of the literature may form an argument not to consider DMC for primary cases. Furthermore, we advise regular clinical and radiological follow up and, on indication, metal ion testing for DMAs. Awareness of these complications will help avoid unnecessary problems for our patients.

P02 Dual mobility cups
P02-289
ASYMPTOMATIC INTRA-PROSTHETIC DUAL MOBILITY CUP DISLOCATION WITH INCREASED METAL ION LEVELS: A CASE REPORT AND REVIEW OF CURRENT LITERATURE.
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Introduction/objections: With increased use of dual mobility cups (DMC) in total and revision hip arthroplasty, surgeons can expect an increase of known and new complications. Intra-prosthetic dislocations (IPD) as well as the modularity of DMC can lead to metal wear. We present a case and review the current literature about this topic to create awareness of this possible destructive problem.

Methods: During routine follow up, we observed an asymptomatic patient with an IPD and elevated serum metal ions (cobalt 30.4 nmol/L and chromium 539.0 nmol/L). Revision surgery was inevitable. Perioperative metallosis and severe wear of the metal shell and metal femoral head supported the IPD. Our literature search was performed by the two authors and focused on DMC, IPD and metal wear.

Results: A successful revision of the DMC was performed and serum metal cobalt and chromium decreased rapidly in the following 3 months. The histopathology showed dense histiocytic aggregates which supports tissue reaction to metal.

Discussion: We present a case and show the current literature about this topic to create awareness of this possible destructive problem.

Conclusions: This case presents an asymptomatic and DMC specific complication which led to elevated serum metal ions, metallosis and revision surgery. Our case and review of the literature may form an argument not to consider DMC for primary cases. Furthermore, we advise regular clinical and radiological follow up and, on indication, metal ion testing for DMAs. Awareness of these complications will help avoid unnecessary problems for our patients.

P02 Dual mobility cups
P02-572
USE OF A SOLID BACKED PRESS-FIT DUAL MOBILITY ACETABULAR SHELL IN HIP REVISION ARTHROPLASTY
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Introduction/objections: The objective of this retrospective study was to determine whether a solid, press-fit, dual-mobility acetabular component could be successfully used for revision total hip arthroplasty cases.

Methods: A series of revision total hip arthroplasties done by a single surgeon performed with a solid, press-fit dual mobility acetabular component was reviewed. We report an average 2-year follow-up (minimum 1 year) on 12 revision total hip arthroplasties treated with solid, press-fit, dual-mobility acetabular components.

Results: In this cohort there were no dislocations, evidence of radiographic loosening of the acetabular component, or any other cause of failure with minimum 1 year follow-up. The median HOS score at 1 year was 91.

Conclusion: We conclude that the use of a solid backed, press-fit, dual-mobility acetabular component is an appropriate option for revision total hip arthroplasty when there is no acetabular bone deficiency.

P02 Dual mobility cups
P02-204
IMPACTION GRAFTING AND CEMENTED DUAL MOBILITY CUP FOR FAILED FIXATION OF ACETABULAR FRACTURE
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Introduction/objections: Bone loss is a major concern after failures of treatment of acetabular fractures. Impaction grafting is an excellent option for restoration of such bone loss but dislocation remains a major concern. Dual mobility total hip replacement is a good option with impaction grafting to restore bone stock and restore patient mobility without fear of dislocation.

Methods: Between January 1, 2011 and December 31, 2013, we performed a retrospective review on 26 acetabular revision surgeries using IBG and a cemented cup in 26 patients. The indications were acetabular deficiency secondary to failed acetabular fixation or failed conservative treatment of acetabular fractures. During that time patients with acetabular bone defects were treated with a cemented dual mobility cup and impaction bone grafting which was protected by Keboul ring in massive bone defects. Each revised cup was individually assessed; 16 (57%) only underwent acetabular revision, whereas 7 (27%) underwent revision of both components.

Results: The HHS improved from 54 to 88 at the last follow up in the group who have had previous internal fixation for their acetabular fracture and improved from 46 to 92 in the group who have had their initial fractures treated conservatively. Regarding complications one patient had a partial perineal nerve palsy which was completely recovered by 6 months and two patients with prolonged wound drainage which resolved by early debridement and antibiotics and retention of the components.

Conclusion: Impaction bone grafting protected by Keboul Cross ring combined with cemented dual mobility cups represents a good option for the management of rim and segmental bone loss after the management of acetabular fractures without the fear of dislocation.

P02 Dual mobility cups
P02-32
CEMENTATION OF A DUAL MOBILITY CUP INTO A WELL-FIXED CEMENTLESS SHELL IN HIGH RISK PATIENTS UNDERGOING REVISION TOTAL ARTHROPLASTY
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Introduction/objections: Cementation of polyethylene liners into well-fixed cementless metal shells has become an option during a revision total hip arthroplasty (THA). We report the outcomes of cementing a dual mobility (DM) component into a stable acetabular shell in high risk patients undergoing revision THA.

Methods: A single-center series of 10 patients undergoing revision THA with a DM cup cemented into an existing well-fixed shell from 2012 to 2016 were retrospectively reviewed. Failure due to aseptic loosening or instability and implant survival at last follow-up were analyzed. The average age was 79.2 years and mean follow-up was 3 years. Indications were recurrent hip dislocation in 8 cases and intraoperative instability with moderate abductor insufficiency in 2 cases. In cases with recurrent dislocation, etiology of instability was classified by Wera type. Statistical analysis was performed using SAS System v 9.4.

Results: At the latest follow-up, Harris Hip Scores improved from 49.3 to 71.3 postoperatively (p<0.001). In the 8 patients with recurrent dislocation, we found 4 cases (50%) of poor acetabular etiology (Wera type II), 2 cases (25%) with abductor deficiency (Wera type III) and 2 cases (25%) with late polyethylene wear (type II). Postoperative recurrent dislocation occurred in one hip (10%), and a Girdlestone procedure was performed due to functional impairment and dementia of the patient. Postoperative dislocations, aseptic loosening of the previous shell or dislocation at the cement-cup interface was not identified.

Conclusion: Although the follow-up of this series is short, cementation of a DM cup into a previous well-fixed socket is a viable option to treat and prevent instability after revision THA, without providing constraint at the cement-cup interface.
Introduction/objectives: Cementless reconstruction in acetabular revision leads to the replacement of bone by more metal artefacts. Acetabular reconstruction with cement, bone and double mobility is an alternative solution for revision and complex primary hips. We represent the result of 65 revisions and 9 primary hips performed over the last 10 years.

Methods: Of the 130 revisions over the last 10 years, 65 were performed with cement, bone graft and double mobility, and this became our favourite acetabular reconstruction method.

Results: Follow up varies between 1 year and 10 years. There were 2 dislocations, both occurring in the same patient, after a left and right hip revision, leading to a revision of the stem in the right hip and the cup and metaphysis of the left hip. One patient underwent DARR for acute infection. There were no early structural failures and no late loosening.

Conclusion: Reconstruction of the acetabulum with bone grafts and cement has several advantages, such as better reconstruction of native acetabular size and center of rotation and reconstruction of bone stock. A double mobility cup is a safe alternative to the use of an all poly cup and increases initial stability. The combination of bone impaction grafting and the use of structural allografts and a Kerboul cross for the more severe defects, is a useful reconstruction strategy in most acetabular revisions.

Methods: A retrospective review of a single center’s revision THA cases from January 1st, 2016 to July 1st, 2017 was conducted. Patients that received this novel construct were included. Demographic data including age, gender, body mass index (BMI), American Anesthesiology Society (ASA) score, smoking history, and calculated Charlson Comorbidity Index (CCI) was collected. Surgical details including reason for revision, THA, time in years from primary THA, outer shell size, dual mobility cup size, and additional fixations was collected. Outcome information on radiographic assessment for implant fixation, infections, re-operations, periprosthetic fractures, and dislocations was collected.

Results: Sixteen patients met the inclusion criteria for the study of which 9 were females and 7 were males. The average age at the time of THA was 61.1 years with an average follow-up of 5.9 months.

Conclusion: Our study demonstrates encouraging results with the use of this novel construct in preventing instability after THA as evidenced by the absence of any dislocation or implant loosening. Although this study is limited by the lack of long-term follow-up and sample size, our novel construct shows promising short-term results. Moreover, as the majority of dislocations occur within the first 3 months, we believe that this construct may present as a new technique to solve the challenge of recurrent dislocation and instability following revision THA.

Introduction/objectives: Distrlocation continues to be one of the most common complications following primary total hip arthroplasty (THA) that dual mobility systems continue to mitigate. Patient-reported outcome measures (PROMs) help clinicians evaluate pain and function, while assessing quality of life and potential complications such as dislocation. The purpose of this study is to evaluate clinical outcomes in primary THA patients receiving a dual mobility acetabular bearing.

Methods: Three hundred forty-five cases as part of a non-randomized, post-market, multicenter study received cementless THA. The primary objective is absence of dislocation with secondary objectives evaluating PROMs and radiographic analysis. The EuroQol-5D (EQ-5D), Harris Hip Score (HHS), and demographics were collected preoperatively, at 6-weeks, 1, 2 and 3 years postoperatively.

Results: The study population consisted of 47.8% men averaging 60.9 years and 29.7 BMI. Subjects were diagnosed primarily with osteoarthritis (94.8%). The HHS increased on average from 54.45 preoperatively to 78.6, 92.4 and 93.5 and 96.4 points at 6-weeks, 1, 2 and 3 years respectively. This trend was also seen in EQ-5D, with 0.72 preoperatively to 0.82, 0.85 and 0.92 at 6-weeks, 1, 2 and 3 years respectively. No failures reported for dislocation.

Conclusion: Study participants receiving a dual mobility acetabular system showed no dislocations, with significant and continuing improvements through use of PROMs. The dual mobility system used in this study improved patient function and quality of life, while reducing risk of dislocation as seen from preoperative through three years postoperatively.
**P03 Fundamental science**

**P03-512**

**DOES THE MUSCLE STRENGTH EFFECT THE BALANCE OF LEVEL OF PATIENTS IN EARLY STAGE OF TOTAL HIP ARTHROPLASTY?**

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**Introduction/objectives:** Total hip arthroplasty (THA) is one of the common surgical procedures for reducing pain, increasing muscle strength and function in patients with osteoarthritis. In studies, it has been reported that limitations of daily living activities, muscle weaknesses and balance disorders of patients persist after THA surgery. The aim of our study is to investigate the effect of muscle strength on balance level in patients in early stage (post-operative 8th week) of THA.

**Methods:** The study comprised 16 patients (9 females, 7 males) with unilateral THA. Hip and knee muscle strength of patients were assessed with hand-held dynamometer and balance levels were assessed with the Telos Computerized Balance Assessment System at 8 weeks postoperatively. Patients were allocated to base on their balance scores (Telos score <40.75) and low (Telos score >40.75).

**Results:** The mean age of patients with high risk of falling was 45.33 ± 20.12 years, body mass index was 26.47 ± 2.67 kg/m². The mean age of patients with low risk of falling was 57.60 ± 11.92 years and body mass index was 28.55 ± 2.89 kg/m². It was determined that there was no significant difference in hip and knee muscle strength between patients with high and low risk of falls (p>0.05).

**Conclusion:** There is no effect of muscle strength on the balance levels of the patients in the early stage of THA. Therefore, we believe that the addition of balance exercises to early classical rehabilitation programs and late follow-up and balance analyzes of patients with THA may give more objective and significant results.

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**P03-255**

**COMPUTER-AIDED DESIGN OF HIP PROSTHESIS: NEW THREE-DIMENSIONAL METHOD FOR THE STUDY OF BONE STRESS PERFORMANCE AT FEMORAL STEM LEVEL**

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**Introduction/objectives:** There are many biomechanics studies that try to determine or predict biomechanical performance of a bone under certain types of stress, but unfortunately they are extremely expensive and require ample computing resources. Our study proposes another option with less computing needs, which speeds up the virtual assessment of biomechanical performance of a bone after a placement of an implant.

**OBJECTIVES:**
- To show an innovative, cost-effective and easy-to-use tool for the design and work on virtual prostheses in the orthopaedics and biomechanics fields.

**Methods:**
- **MATERIAL AND METHODS:**
  A comprehensive analysis is run on a computer designed virtual femoral stem, implanted in an also virtual femur analysing its biomechanical performance using finite elements method. Those models allow calculation of the internal bone stress and a node by node stress comparison before and after the surgery.
  In order to visualise the stress changes and evaluate the performance of a new implant design, we use a voxel model.

**Results:**
- The proposed methodology makes it possible to study the stress states of a bone before and after the surgery.
- Our study calculates the internal stress state of the bone to enable a global performance evaluation of the bone-prosthesis construct.

**Conclusion:** The application of virtual design and computational analysis using voxel models within the orthopaedic surgery and traumatology is promising. Its application will contribute to the development of new orthopaedic implants, not only of the hip, but also of other anatomical regions. This tool may enable the orthopaedic surgeons and prosthesis designers to run three-dimensional evaluations of the bone remodeling after a surgery.
Introduction/objectives: Some authors have described the relations between the ischiatic tuberosity, lesser trochanter, the quadratus femoris and the sciatic nerve on the posterior aspect of the hip. The aim of this paper was to study the variations involving the sciatic nerve on the posterior aspect of the hip.

Methods: The ischiofemoral distance (IFD) was studied, as were the structures included in this space. The quadratus femoris thickness, width and length were measured. Its relation with the sciatic nerve was evaluated. Sciatic nerve characteristics were studied, including distances to the sciatic tuberosity and the thronocthetic region. The data was analyzed with SPSS.

Results: The mean IFD was 2.95cm (SD 1.30), and is gender-dependent, being higher in the females specimens (mean 2.7 cm). In this region the mean of the measured sciatic wide and thickness were 1.40cm and 0.09cm, and the mean wide, width and length of the quadratus femoris were 3.92, 4.89 and 1.27 centimeters. The distances from the sciatic nerve to the ischiatic tuberosity and lesser trochanter were 1.47cm (SD 0.60) and 0.24cm (SD 0.72).

Conclusion: The results of this study show that possibly there is an anatomical background to the ischiofemoral impingement syndrome. The mean ischiofemoral distance in this sample was 2.5 cm, similar to what is describe in the literature. The IFD was also lower in the male specimens, and so male specimens may be more prone to IFI.
Introduction/objectives: Anterior Femoroacetabular impingement (FAI) is associated with cartilage damage in the anterolateral region of the acetabulum. But it is unclear whether the cartilage damage occurs at the exact zone of impingement. Therefore we asked: Does the mean acetabular dGEMRIC index differ between superior acetabular clock positions with and without impingement?

Methods: An IRB-approved retrospective comparative study of 21 hips of 21 patients with symptomatic anterior FAI and no osteoarthritis was performed. Delayed Gadolinium-enhanced MRI of cartilage (dGEMRIC) and CT-based 3D impingement simulation software of the same hip were performed. 10 had cam-type FAI, 8 had pincer-type FAI and three no osteoarthritis was performed. Delayed Gadolinium-enhanced MRI of cartilage (dGEMRIC) and CT-based 3D impingement simulation software of the same hip were performed. 10 had cam-type FAI, 8 had pincer-type FAI and three had mixed type FAI. Mean age was 30±9 years and 71% were female. 62% underwent surgical/mismatch for FAI. Clock positions with impingement were defined in CT-based 3D impingement simulation software. T-test and ANOVA were used.

Results: (1) Mean peripheral superior acetabular dGEMRIC index for clock positions with impingement were significantly (p<0.001) lower (472ms) compared to clock positions without impingement (592ms). (2) The lowest mean acetabular dGEMRIC index (472ms) was located at the zone of maximal anterior impingement (2:00 o’clock). Mean acetabular dGEMRIC was significantly lower at 2:00 o’clock (472ms, p<0.001) and 3:00 o’clock (474ms, p<0.001) compared to 11:00 o’clock (650ms).

Conclusion: Maximum acetabular cartilage damage in terms of peripheral acetabular dGEMRIC index was observed at the zone of maximal anterior impingement. Mean acetabular dGEMRIC was significantly lower anteriorly compared to posteriorly. dGEMRIC can be used for diagnosis of acetabular cartilage damage caused by anterior FAI.
Introduction: To determine the pattern and distribution of bone turnover after total hip arthroplasty.

Methods: 39 patients (25 women/14 men) with a mean age of 67.9 years (36-84 years) underwent THA. Patients with revision arthroplasty, malignancies, renal failure, chronic liver disease and those treated with estrogen, bisphosphonates, vitamin D or calcium supplements were excluded. Blood samples were taken 24 preoperatively, during the operation and 24h, 4 days, 8-12 weeks postoperatively. Bone formation markers measured: Osteocalcin, bone-specific alkaline phosphatase, procollagen type I C-terminal propeptide. Bone resorption markers measured: Deoxypyridinoline, tartrate-resistant acid phosphatase 5b, N-telopeptide type I collagen.

Results: Bone turnover increases after arthroplasty, with all markers showing significant increase. Timing and magnitude of increases vary for each marker. Rise is greater for resorption than formation. Formation initially decreased up to 1-4 postoperative days. An earlier rise in bone resorption markers and a later increase in bone formation markers were found. Resorption markers return earlier than formation markers to baseline. We found no significant differences between males/females.

Conclusion: It is clearly demonstrated that a major orthopaedic surgery, such as THA, results in a dramatic change of bone metabolism. An intense bone turnover is the direct result of surgical intervention, contributing both bone formation and bone resorption. As a next step, these data would advise to investigate whether a limited and timely postoperative treatment with some antiresorptive agent, may be in issue for clinical application.

Introduction/objectives: COMPARISONS OF CITATIONS IN WEB OF SCIENCE, SCOPUS, AND GOOGLE SCHOLAR FOR ARTICLES PUBLISHED IN TOTAL HIP ARTHROPLASTY REHABILITATION

Methods: Randomized controlled trials of 58 articles published in total hip arthroplasty rehabilitation were included between 1998 and December 2016. Total citation counts for each article were retrieved from Web of Science, Scopus, and Google Scholar. For each article, the following features were analyzed: journal impact factor, year of publication, number of citations, citation density, geographic origin, article type.

Results: The average number of citations per article was significantly different from 3 databases. Mean scores (with min-max) for Web of Science were 22.76 (0.186), Scopus 29.53 (0.219), Google Scholar 52.36 (0.348). The difference in the number of citations between the databases was found to be statistically significant (P < 0.001 for both comparisons). We did not find a statistically significant association between journal impact factor and the number of citations by Google Scholar, Scopus, and Web of Science databases (p > 0.05).

Conclusion: The rate of citation for studies on total hip arthroplasty rehabilitation is lower than the literature. There is a need for good-quality randomized controlled study for increasing the number of citations.

Introduction/objectives: SEVERITY OF HIP OSTEONECROSIS AFFECTS LOWER EXTREMITY COMPENSATORY MECHANISMS IN SPINOPELVIC MALALIGNMENT

Methods: IRB-approved retrospective study. In the database (2016-2018) 360 hips (mean age 31 years) eligible for joint-preserving surgery for AVN and preoperative high-resolution 3D MRI of the hip were identified. Hips were staged according to ARCO: I 3 hips, II 8 hips, III 17 hips, IV 13 hips. Hips were allocated to the ARCO subclassification for estimated size of necrosis. Current criteria (ARCO criteria) are based on radiographs and 2D MRI only. Trust 3D MRI for calculation of (1) necrotic volume, (2) necrotic surface area, (3) for comparison between ARCO stages for size of necrosis.

Results: Size of necrosis is an important predictor for successful surgical treatment of femoral head necrosis (AVN). Current criteria (ARCO criteria) are based on radiographs and 2D MRI only. Trust 3D MRI for calculation of (1) necrotic volume, (2) necrotic surface area, (3) for comparison between ARCO stages for size of necrosis.

Introduction/objectives: A NOVEL, NON-INVASIVE METHOD FOR HIGH-RESOLUTION 3D MRI BASED VOLUME AND SURFACE CALCULATION IN FEMORAL HEAD NECROSIS: A PILOT STUDY

Results: (1)Mean relative necrotic volume: 16 ± 16% (2)Mean relative necrotic surface area: 22 ± 13% (3)Over-estimate in standard deviation between groups was large. Group A: necrotic volume 5 ± 3%, necrotic surface 6 ± 4% Group B: necrotic volume 14 ± 14%, necrotic surface 20 ± 17% Group C: necrotic volume 33 ± 19%, necrotic surface 41 ± 19%.

Conclusion: The ARCO classification to estimate size of necrosis discriminates poorly between actual 3D necrotic volume and necrotic surface in hips with AVN. Instead this novel 3D MRI-based technique has great potential to improve preoperative diagnosis.
P03 Fundamental science

P03-330
SLEEP QUALITY IN PATIENTS WITH OSTEOARTHRITIS OF THE HIP
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Introduction/objectives: Sleep quality in patients with hip osteoarthritis is a chronic condition, which commonly affects the hip. Clinical and radiographic evaluation. Patients were evaluated using hip specific outcome measures, WOMAC, Hip Outcome Score (HOS), and Modified Harris Hip Score (mHHS). Sleep quality was assessed using Pittsburgh Sleep Quality Index (PSQI). A multiple regression model was used to assess factors associated with poor sleep quality.

Results: A total of 106 patients were analyzed, with an average age of 63 years (20-82). All patients had a Tonnis Grade of two or three. The average ASA Classification was II and BMI of 25.0 (7.5). WOMAC, HOS, and mHHS were significantly correlated with PSQI (p=0.001, p=0.013, p=0.002). WOMAC, SF 12, ASA Classification, and history of symptomatic hip arthritis were associated with poor sleep quality in the multiple regression model (p=0.015, p=0.001, p=0.002, and p=0.004 respectively).

Conclusion: Patients with hip osteoarthritis, enduring a more symptomatic and painful hip, are susceptible to reduced sleep quality. There is a direct correlation between worsening patient reported hip outcome scores and sleep quality. The WOMAC score is an independent predictor of poor sleep quality and patients with poor hip metrics should be screened for sleep disturbance.

P03-341
LEVEL OF EVIDENCE OF PRESENTATIONS AT EUROPEAN HIP SOCIETY OF THE CONGRESSES FROM 2002 TO 2016
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Introduction/objectives: The usual conventions of the European Hip Society are a platform for sharing and discussing evidence that is of importance to the hip surgeon. The purpose of this study is to determine the level of evidence of abstracts presented in 15 usual congresses between 2002 and 2016.

Methods: Two reviewers independently retrospectively screened the total of 2028 abstracts presented at the European Hip Society biannual congresses 2002-2016 for clinical evidence. The abstracts were screened using indicators of quality of evidence. The level of evidence was determined using the American Academy of Orthopaedic Surgeons Classification system.

Results: In total, two thousand twenty-eight abstracts were screened. Ten thousand six hundred and ninety-nine presentations were included. The majority of presentations (72%) included RCTs in the title or abstract. Sixty-four RCT were included in the final analysis. In the majority of the abstracts, title (72%), study design (73%), procedures (100%), objective (67%), primary outcome measure (66%), number of patients-randomized (72%), primary outcome (38%), and baseline outcome (94%) were reported satisfactorily. There were no reporting quality for randomization method (92%), blinding (91%), number of patients analyzed (70%), number of patients analyzed (70%), and effect size (59%). Evaluations were made over 15 items in the CONSORT guideline to assess registration numbers for each abstract. The overall quality of RCT abstracts presented at the EHS of the Congresses appears to be intermediate and should be improved for clear, sheer and detailed information to be transferred.

P04 Hip arthroscopy

P04-499
ARTHROSCOPIC TREATMENT FOR FEMORAL NECK ENCHONDROMA - CASE REPORT
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Introduction/objectives: Enchondromas are benign hyaline cartilage tumours that radiographically present with irregular intra trabecular calcification. Surgical treatment is indicated when there is evolution of the lesion or when it becomes symptomatic. It consists on lesion curettage with or without bone grafting and usually it's curative. Hip arthroscopy allows good visualization of the central and peripheral compartment of the hip, thereby decreasing the morbidity resulting from the surgery.

Methods: A 50 years old female patient was referred with left hip pain. X-Ray and MRI revealed a chondroid lesion located in the medial aspect of the femoral neck with a diameter of 2.8 cm without cortex invasion. After initial treatment with NSAID's of 6 weeks the complaints persisted. The patient was proposed for arthroscopic curettage of the lesion. She underwent hip arthroscopy using the out-side technique (peripheral access first after a T shaped capsulotomy) for lesion curettage. The femoral neck was visualized after a T shaped capsulotomy. Curettage of the lesion was performed under fluoroscopic control. After the enchondroma excision, bone graft was used to fill the defect.

Results: After 3 months, the outcome is excellent. She reported a WOMAC score of 95 (63.3 pre-op), an MHHS of 87 (69 pre-op) and a VAS for pain score of 3 (6 pre-op). No radiographic signs of osteonecrosis are observed.

Conclusion: Hip arthroscopy is a therapeutic option in dealing with femoral neck lesions, allowing its removal without recourse to an arthroplasty, thereby minimizing the surgical morbidity and improving the recovery of these patients.
Case Study: Objectives: In patients with persistent groin pain after hip arthroplasty the iliopsoas tendon can be the cause of the pain. One of the treatment options is arthroscopic release of the iliopsoas tendon. This study evaluates the effect of arthroscopic psoas release on pain and functional outcome in patients after total hip arthroplasty.

Methods: We present a case series of 8 patients with psoas impingement after total hip arthroplasty. In 7 patients diagnosis was made with a bupivacaine injection around the psoas tendon which temporarily resulted in pain relief, in the other patient diagnosis was likely because of physical examination and a clear overhang of the top of the hip arthroplasty on X-ray. All patients were treated arthroscopically via 2 portals in which the psoas tendon was released. At final follow-up patients were asked to fill in the HOOS outcome score and report on pain and satisfaction after surgery.

Results: At time of surgery average age was 64 (range 45-75). Seven patients (87.5%) were female and one male (12.5%). Median final follow-up was 90 weeks after surgery (IQR 60-134). Median domain scores of the HOOS questionnaire were 53 (IQR 35-86) for symptoms, 65 (IQR 29-91) for pain, 53 (IQR 34-81) for activities of daily living, 22 (IQR 8-45) for sports and recreation, and 47 (IQR 23-97) for quality of life. Six out of eight patients (75%) reported improvement on pain and were satisfied at final follow up. Two patients (25%) were not improved after surgery; one patient reported no difference and one patient had experienced deterioration of pain and was unsatisfied.

Conclusion: We believe arthroscopic psoas release is a safe and viable treatment option for patients with psoas impingement after total hip arthroplasty.
ARE RESULTS OF ARTHROSCOPIC LABRAL REPAIR DURABLE IN DYSPLASIA AT MID-TERM FOLLOW-UP? A TWO CENTRE MATCHED COHORT ANALYSIS

Introduction/objectives: Studies investigating dysplasia in hip arthroscopy are often limited to the short-term and unable to account for demographics that may vary between populations. This study aimed to determine midterm failure and outcomes for arthroscopic labral repair in dysplasia and compare them to rigorously matched controls.

Methods: Primary arthroscopic labral repair performed at two centers, 2008 to 2011, were prospectively collected. Patients with lateral center edge angle (LCEA) <20° were 1:2 propensity matched to controls by age, gender, laterality, BMI, Tonnis grade, and capsular repair. Groups were compared using visual analog pain scale (VAS), modified Harris Hip Score (mHHS), and Hip Outcome Score-Sports Specific Subscale (HOS-SSS). Level of Evidence: 3, Cohort study.

Results: All dysplastic patients (mean LCEA 21.6°, range: 13.0-24.9°) were matched to 96 controls (mean LCEA 32.1°, range: 25.2-32), and followed for a mean of 5.7 years (median 5.0-7.7). Patients achieved mean VAS improvements of 3.3 points, mHHS of 19.5, and HOS-SSS of 29.0 points (p<0.01) with no significant differences between dysplasia and controls (p >0.05). Five year revision-free survival was 83% for dysplasia and 78% for controls (p=0.53). BMI less or equal to 30 was predicted failure to reach minimal clinically important difference (MCID). To account for demographics that may vary between populations, this study aimed to determine mid-term failure and outcomes that are durable compared to the short-term.

Conclusion: With careful selection and modern techniques, dysplastic patients can benefit significantly and durably from arthroscopic labral repair, with similar midterm outcomes and failure rates to controls. BMI less or equal to 30 was associated with increased revision surgery risk (p< 0.01). Age >35 (p<0.05) and Tonnis grade 0 (p<0.01) were predictors of failure to reach minimal clinically important difference (MCID).

PROSPECTIVE STUDY OF PATIENTS' CLINICAL PRESENTATION, PHYSICAL EXAMINATION, INTRAOPERATIVE FINDINGS, AND SURGICAL PROCEDURES

Introduction/objectives: There is little evidence on generalized ligamentous laxity in patients undergoing hip arthroscopy. The purpose is to study the prevalence, clinical presentation, physical examination, intraoperative findings and surgical treatments in such patients.

Methods: Data was collected on patients between February 2013 and November 2017 who underwent primary hip arthroscopy. Patients were included if their preoperative Beighton score was 0 (Group 1) or greater equal to 4 (Group 2). Groups were compared with documented modified Harris Hip Score (mHHS), Non-Arthritic Hip Score (NAHS), Hip Outcome Score-Sports Specific Subscale (HOS-SSS), International Hip Outcome Tool (HOT-12), and Visual Analog Scale (VAS). Patients with full radiographic analysis were included in the study. The relative risk of having Beighton greater equal to 4 for women vs. men was 9.0422 times higher. The relative risk of Beighton greater equal to 4 for men vs. women was 6.8725, and the odds of women having Beighton greater equal to 4 was 5.0422 times higher than men. Patients in Group 2 had a younger age at onset of symptoms (P<0.0001), higher range of preoperative motion with hip flexion (P<0.0001), abduction (P<0.0017), internal rotation (P<0.0064), external rotation (P<0.0005), smaller lateral lax (P<0.0001), and a higher proportion underwent lateral repair (P<0.0001) and capsular repair (P<0.0001) compared to Group 1.

Conclusion: There is a greater prevalence of generalized ligamentous laxity in the young female population. Orthopedic surgeons treating these patients should have suspicion for capsular redundancy and soft tissue laxity as a source of pain.

OUTCOMES OF HIP ARTHROSCOPY WITH CONCOMITANT PERACETABULAR OSTEOTOMY. MINIMUM FIVE-YEAR FOLLOW-UP

Introduction/objectives: This study was conducted to report minimum five-year follow-up results of concomitant hip arthroscopy and periacetabular osteotomy (PAO) to treat acetabular dysplasia and intra-articular pathology.

Methods: Data were prospectively collected from October 2010 to June 2013. Patients were included in this study if they underwent concomitant hip arthroscopy and PAO with eligibility for minimum five-year follow-up. Follow-up was complete with documented modified Harris Hip Score (mHHS), Non-Arthritic Hip Score (NAHS), Hip Outcome Score-Sports Specific Subscale (HOS-SSS), International Hip Outcome Tool (HOT-12), and Visual Analog Scale (VAS), and patient satisfaction on a 0-10 scale. Three of fourteen eligible patients completed follow-up at a minimum of five years after surgery. There were ten females and three males. The average age of the patients was 21.9 years, and the average body mass index was 25.

Results: The mean lateral center-edge angle increased from 15.1 to 30.4 (P<0.001), and anteroposterior center-edge angle increased from 11.3 to 28.9°(P<0.001). The Tonnis angle of acetabular inclination decreased from 18.9 to 4.9°(P<0.001). No arthritic changes were seen in preoperative radiographs, and there was no arthritic progression in radiographs taken at the latest clinical visit. At patient reported-outcomes scores demonstrated significant improvement in preoperative baseline to the minimum five-year follow-up scores (mHHS, P<0.001; NAHS, P<0.003; HOS-SS, P<0.05). VAAS decreased from a preoperative mean of 6.2 to 3.6 at latest follow-up (P<0.004).

Conclusion: Concomitant hip arthroscopy and PAO appears to be a safe and effective procedure with favourable mid-term outcomes that are durable compared to the short-term.
Case Study: Bone tumours in general are very rare, benign in contrast to malign more often though. The femoral head and neck are frequent localizations for benign tumours and can lead to instability of the bone. Through the lateral approach there is a limited accessibility and exposure to ensure a complete curettage. In the present study we present a case series of 6 patients operated via arthroscopic assisted direct anterior mini-open approach.

5 patients were operated arthroscopic assisted direct anterior mini-open approach between 2013-2015. Two with bone instability due to fibrocartilaginous degeneration of the femoral neck (1), 4 subchondral chondromalacia of the femoral head (2). Atypical chondroid tumors and 2 chondroblastoma. Al were diagnosed by imaging, 2 were additionally biopsied. After a direct anterior approach and a shaped rasp-cytoplasty a wounding of the femoral neck was performed. The curettage was performed arthroscopically assisted with a sharp curette and a high-speed burr. After that a biologic reconstruction was done. In the 2 cases of fibrocartilage an additional osteosynthesis for stabilization of the bone was indicated. By distracting the leg in 4 of the cases of chondromalacia the integrity of the cartilage could be controled by arthroscopy of the hip joint. Postoperatively the patients had 6 weeks of partial weight bearing with 15 kg. Follow up was done after 6 weeks, 12 weeks and 1 year.

Intraoperative all tumours could be reached by the described approach and a complete curettage without collateral damage could be carried out. In all 6 cases at 1 year follow-up a complete recovery of the bony situation could be observed. No tumour recurrence was observed. In none of the cases a revision surgery was necessary.

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P04 Hip arthroscopy

P04-592
CHONDROFILLER GEL USED IN HIP ARTHROSCOPY FOR TREATMENT OF CARTILAGE LESIONS: A COHORT STUDY WITH 6 TO 18-MONTH FOLLOW UP

Introduction/objectives: ChondroFiller gel is an absorbable collagen implant which is intended to serve as a protective cover of the articular cartilage defect, allowing chondrocyte migration into the defect. The purpose of our study was to evaluate usage of ChondroFiller gel in the treatment of cartilage lesions in the hip joint during arthroscopy.

Methods: In the period 2015-2017, 26 hips were treated using ChondroFiller gel. The method was used in patients operated for acetabular cartilage lesions. The study group consisted of 5 females and 21 males. Hip Osteoarthritis was graded using the Tönnis classification. Hip function was assessed pre- and postoperatively using modified Harris Hip Score (mHHS). MRI was performed 6 months after surgery.

Results: Using the Tönnis classification, 11 hips were grade-0, 13 grade-1 and 2 grade-2. Preoperative mHHS ranged from 61 to 88 (average 72). Postoperative mHHS ranged from 68 to 100 (average 94). 20 results were classified as excellent, 4 as good and 2 as poor. Both poor results were observed in patients categorized preoperatively as Tönnis grade-2. Improvement of mHHS in Tönnis grade-0 and 1 patient was statistically significant (P<0.001), but there was no significant improvement in patients with Tönnis grade-2 and both patients subsequently underwent total hip replacement. Excellent and good results in the mHHS correlated with signs of cartilage healing on MRI imaging.

Conclusion: Arthroscopic repair of articular cartilage damage using ChondroFiller gel is an effective technique in the treatment of early cartilage damage. We have seen encouraging midterm results, although further longer term studies are warranted. Tönnis grade-2 or higher change on pre-operative radiographs is a contraindication to the use of the gel.

P04 Hip arthroscopy

P04-97
HIP DYSPLASIA AND ACETABULAR OVERCOVERAGE NEGATIVELY AFFECT LONGTERM OUTCOME AFTER OPEN SURGICAL TREATMENT FOR CAM FAI: A 15-YEAR FOLLOW-UP STUDY

Introduction/objectives: Cam-type Femoroacetabular Impingement (FAI) has been described in 2003 and is a cause for hip pain and osteoarthritis of the hip. But long-term results for surgical treatment are rare. Therefore, we intend to determine The cumulative 10-year and 15-year survivorship (2) Predictive factors associated with the endpoints.

Methods: We retrospectively evaluated 116 hips of 100 patients that underwent cam resection using a surgical hip dislocation between 1997 and 2000. Mean follow-up was 17 years (range 1-20) and the follow-up rate was 94%. Mean preoperative age was 32 years. Surgical hip dislocation and cam resection was performed without evaluation of pincer-FAI. To calculate the cumulative survivorship the Kaplan Meier method was used. The following endpoints were used: THA, subsequent FAI surgery, progression of OA and Merle of Aubigné score less than 15 points. Cox regression model was used to calculate predictive factors for failure.

Results: (1) The cumulative 10-year and 15-year survivorship was 70% and 73% with the single endpoint THA. Using all endpoints, the cumulative 10-year and 15-year survivorship was 65% and 59%. At follow-up, 26 hips (31%) underwent conversion to THA. Preoperative hip dysplasia (LCE-angle <22°), overcoverage (LCE-angle >34°), female sex and preoperative age >40 years resulted in a lower survivorship.

Conclusion: Preoperative hip dysplasia, acetabular overcoverage, female sex and preoperative age >40 years negatively affect the long-term outcome after open treatment for cam FAI. Careful assessment of acetabular morphology is recommended before cam FAI surgery. Concomitant acetabular overcoverage should be treated with concomitant rim trimming. Cam FAI surgery should be performed with caution in the presence of hip dysplasia.

P04 Hip arthroscopy

P04-251
ARTHROSCOPIC CAPSULAR PULATION IN PATIENTS WITH LABRAL TEARS AND BORDERLINE DYSPLASIA OF THE HIP: ANALYSIS OF RISK FACTORS FOR FAILURE

Introduction/objectives: Borderline dysplastic patients with lower lateral center-edge angle (LCEA) and greater age may be at a higher risk of failure after arthroscopic capsular plication. The objective of this study is to evaluate indications for arthroscopic capsular plication in patients with borderline hip dysplasia and to report on the potential risk factors for failure with this approach.

Methods: Data were retrospectively reviewed for all patients between 15 and 40 years of age who underwent hip arthroscopy. Inclusion criteria were an LCEA between 16-25, Tönnis grade less than 1, primary cases with capsular plication, and minimum two-year follow-up. Patients were excluded if they had any history of previous goldplating hip procedure, condition, or diagnosis of osteoarthritis with Tönnis grade greater than 2. The “success” group consisted of all patients who achieved the patient acceptable symptomatic state (PASS) of modified Harris Hip Score (mHHS) greater than 74 and had no radiological hip surgeries subsequent to their index arthroscopy. The “failure” group was patients who were below the PASS at final follow-up, required secondary arthroscopy, or conversion to total hip arthroplasty (THA).

Results: Risk factor analysis revealed that the “failure” group were older than the “success” group (p = 0.005). LCEA did not differ between the groups and no other risk factors for failure were identified.

Conclusion: Strict criteria for patient selection and meticulous repair or augmentation of the static stabilizers of the hip yield favorable clinical outcomes in this study cohort with borderline dysplasia. Increased age was the main risk factor for failure in the management of borderline hip dysplasia with isolated arthroscopic hip surgery with capsular plication.

P04 Hip arthroscopy

P04-256
PRIMARY HIP ARTHROSCOPY WITH LABRAL RECONSTRUCTION IS THERE A DIFFERENCE BETWEEN AUTOGRRAFT AND ALLOGRAFT?

Introduction/objectives: Labral reconstruction has been described as a solution for the irreparable labrum. Initial techniques employed autographs, while more recent procedures have utilized allografts. The purpose is to compare patient-reported outcome scores (PROs) and the survivorship rate between two groups of patients who underwent primary labral reconstruction with hamstring tendons graft. One group with autograph and the second group with allograft.

Methods: Data was reviewed from September 2010 to March 2015. Inclusion criteria were as follows: primary labral arthroscopy with labral reconstruction, with either a hamstring autograph or allograft, minimum two-year postoperative measures for the modified Harris Hip Score (mHHS), Non-Arthritic Hip Score, Hip Outcome Score-Sports Specific Subscale, and Visual Analogue Scale (VAS). Exclusion criteria were previous ipsilateral hip surgery, previous hip conditions, preoperative Tönnis osteoarthritic grade ≥4, and Worker’s Compensation claims.

Results: 29 patients (29 hips) were included: 17 allograft patients (17 hips) and 12 autograft patients (12 hips). All included patients had an 85% follow-up rate. All PROs and VAS demonstrated significant improvements at latest follow-up except for mHHS for the autograft group (p<0.004). The allograft group was found to have a significantly higher mean patient satisfaction score than the autograft group.

Conclusion: Primary hip labral arthroscopic reconstruction yielded improvements in PROs and patient satisfaction. There were no differences in clinical outcomes between hamstring autograft versus allograft. Hamstring autograft and allograft may be considered comparable graft choices for primary reconstruction.
P04 Hip arthroscopy

P04-246 ENDOSCOPIC TREATMENT OF DEEP GLUTEAL SYNDROME: SURGICAL TECHNIQUE AND RESULTS

Introduction/objectives: Deep gluteal syndrome (DGS) is an entity characterized by pain or paresthesia on the buttock, hip or posterior thigh caused by a non-discoogenic, extra-pelvic compression of the sciatic nerve. This compression can have multiple etiologies and is often a difficult and neglected diagnosis. An endoscopic approach allows for direct visualization and decompression of the sciatic nerve in the deep gluteal space, with minimal morbidity. We present our results with this technique, technical key points, clinical anatomy, causes for compression and patients results.

Methods: We conducted a retrospective, transversal study, collecting data from patients between January 2013 and December 2016. All patients presented posterior hip pain, hip/thigh paresthesia and difficulty to remain in a seated position. Lumbar MRI excluded discogenic pain. A minimal 3m conservative periods was trialed. AVS, WOMAC, and subjective symptom were used. Endoscopic technique was done in lateral decubitus, with sciatic nerve decompression from the sciatic foramen to ischial tuberosity, followed by piniformis tenotomy.

Results: The study included 23 patients, 16 female, 7 male, with a mean age of 41.2y (24 - 67y). Mean duration of symptoms was 2.3y (6m - 8y). Mean duration of symptoms was 2.3y (6m - 8y). Mean follow-up was from 3m up to 28m. Mean AVS improved from 7.4 (6 - 10) to 2.7 (0 - 6). Mean WOMAC improved from 56.4 (47.3 - 77.6) to 84.8 (56.3 - 100). Subjectively, 11 patients were very satisfied, 8 satisfied, 4 indifferent.

Conclusion: DGS is an unusual, undiagnosed and neglected pathology. Clinical suspicion is crucial for a correct diagnosis. If conservative treatment fails, and endoscopic procedure, with sciatic decompression and piniformis tenotomy is an effective technique with little to no morbidity associated.

P04 Hip arthroscopy

P04-328 INTRACAPSULAR TUMORS OF THE HIP: AN ARTHROSCOPIC APPROACH

Introduction/objectives: Intracapsular benign tumors of the hip are a particularly rare entity. Due to the complex hip anatomy and approaches, an open procedure is usually associated with some sequelae. To overcome this, hip arthroscopy as evolved and has shown great promise as a valid technique, with at least the same results as an open procedure, without its morbidity.

Methods: A retrospective, transversal study was conducted regarding hip arthroscopy for the treatment of patients with a diagnosed intracapsular benign tumor between January 2014 and December 2017. All patients were treated by the same surgeon and were submitted to VAS, WOMAC and subjective satisfaction scores. Hip arthroscopy was conducted by a transcapsular approach in dorsal decubitus and a traction table.

Results: Five patients were included in this study; 3 female and 2 male, with a mean age of 33y (19 - 57y). Mean time of symptoms was 1.5y (2m - 7y). Three cases were diagnosed with an osteochondroma, one case with an enchondroma and the last one with a villonodular synovitis. VAS improved from a mean 6.9 (6 - 10) to 0.7 (0 - 2), and WOMAC score from a mean 46.4 (27.3 - 81.8) to 84.8 (76.3 - 100). Subjectively, 3 patients were very satisfied, 2 satisfied.

Conclusion: Hip arthroscopy is a valid alternative to the classic open procedures, allowing the surgical resection of the intracapsular tumors and treatment of concomitant hip pathology, while being minimally invasive, and thus providing less morbidity and greater patient satisfaction.

P04 Hip arthroscopy

P04-392 ARTHROSCOPIC TREATMENT OF HIP INTRA ARTICULAR OSTEOID OSTEOMA

Introduction/objectives: Historically the golden standard treatment for acetabular Osteoid Osteomas has been curettage by open surgery. Latter CT guided radiofrequency ablation has gain more and more popularity but this is associated to soft tissue complications and to chondral damage when the lesion is located close to the cartilage layer. There are a few reports about the efficacy of arthroscopic curettage of the previous treatment or to the localization of the lesion, an arthroscopic treatment may be useful and successful.

Methods: We describe a series of cases treated arthroscopically. Lesion localization was mostly on the femur side. All patients had a complete preoperative clinical evaluation including MHHS and NAHS and X-Rays, and MRI or CT scan were performed. In all cases we performed a central compartment first technique with antero lateral and mid-anterior portals.

Results: The lesions were detected through direct vision and fluoroscopic assistance and were removed using arthroscopic curette, shaver and radiofrequency. The possibility of using flexible radiofrequency devices is very helpful especially in the acetabular side and allows to reach the lesion and to cauterize the deep portion of it. Associated lesions were detected in 20% of the cases. All patients had an immediate post-operative pain relief and a complete recovery in 2 months. Patients with associated lesions had a complete recovery in 5 months time.

Conclusion: Hip arthroscopy may be a valid tool to treat intra articular osteoid ostema reducing complications due to open surgery or to CT guided radiofrequency treatments. Hip arthroscopy can also allow to treat associated lesions such as labral tears, femoroacetabular impingement or chondral damage.

P04 Hip arthroscopy

P04-17 RETURN TO WORK AFTER ARTHROSCOPIC SURGERY FOR FEMORAL ACETABULAR IMPINGEMENT IN PATIENTS YOUNGER THAN 30 YEARS

Introduction/objectives: The return-to-sport after FAI surgery has been discussed most frequently. However, since most of the patients who had undergone FAI surgery are younger, the socioeconomic perspective is becoming increasingly important. The aim of this work was to analyse the return-to-work after arthroscopic FAI surgery in patients younger than 30 years.

Methods: 43 patients (between 18 and 30 years) who underwent arthroscopic FAI surgery due April 2014 to April 2015 were analyzed prospectively. We divided our patients in 3 groups depending on their workloads (sitting-, standing- and work with physical activity) and measured the time to return-to-work. After a follow-up of 20.4 months (14-28 months) the HOOS and WOMAC score were also collected.

Results: 4/5 patients achieved 100% workability. In the comparison of the groups, the average time of return-to-work was 4.6 weeks for sitting-, 7.3 weeks for standing-, and 24.3 weeks for physical activity. There was a significant difference between the groups (p=0.04). The groups did not differ in age, body size, body weight and BMI.

Conclusions: This work aims to show the feasibility, surgical technique and key points in the approach and treatment of these tumors by hip arthroscopy.
Hip preservation surgery

PO5-62

HIP PRESERVATION SURGERY FOR FEMORO-ACETABULAR IMPINGEMENT IN PATIENTS WITH OSTEO-NECROSIS OF FEMORAL HEAD

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Introduction/objectives: To describe femoro-acetabular impingement (FAI) in patients with avascular necrosis of femoral head. To study outcomes of hip preservation surgery in these patients.

Methods: We studied 15 patients with FAI secondary to osteonecrosis of femoral head. This entity has not been described before. Partial collapse of femoral head occurs, particularly in the antero-superior part of femoral head, secondary to osteonecrosis. With subsequent remodeling, periphery of the femoral head flattens with formation of osteophytes. All these patients were managed with openarthroscopic osteochondroplasty.

These patients had symptoms of impingement. Joint space was well maintained on radiographs and magnetic resonance imaging (MRI). Cam deformity was studied on computed tomography and MRI. In 6 patients open osteochondroplasty was done using surgical hip dislocation. In 9 patients arthroscopic femoral head osteochondroplasty was done. Patients were followed prospectively for hip pain (VAS), Harris hip score (HHS), Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and hip range of motion. Statistical analysis was performed using Students t-test.

Results: Statistically significant improvement in the VAS for pain, HHS and WOMAC score and hip range of motion was noted. Mean HHS improved from 71.3 (SD, 19) to 89.7 (SD, 14.5), p-value 0.0078. Mean WOMAC improved from 73.6 (SD, 15) to 84.2 (SD, 16), p-value 0.0154. Impingement test became negative in all the patients. There was no conversion to total hip arthroplasty at the mean follow-up of 2.3 years. All patients could sit on the floor cross-legged and squat.

Conclusion: Hip preservation surgery leads to good outcomes in carefully selected patients with osteonecrosis and partial collapse of femoral head.

PO5-131

HIP OSTEOICROSIS - A CASE OF SPONTANEOUS RESOLUTION

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Introduction/objectives: Avascular Necrosis (AVN) of the femoral head is a well-known entity but its etiology and treatment remains subject of much discussion. Our objective was to report and analyse a clinical case of bilateral hip osteonecrosis (Ficat I and IV) in a patient with lupus on steroids with spontaneous resolution with a follow up of 8 years.

Methods: A 33-year-old female complained of bilateral groin pain worse on the right side, with no trauma. History of systemic lupus erythematosus with chronic steroid treatment. On examination, she had mild bilateral groin pain when walking exacerbated with hip mobilization. Magnetic resonance revealed bilateral AVN/Ficat IV on the right and Ficat III on the left. Subjected to right cementless total hip arthroplasty. Two years later a new MRI showed excellent evolution on the left side compared to the previous MRI.

Results: No complication after surgery on the right side with a Harris Hip Score of 95. No complaints on the left side after a follow-up of 8 years.

Conclusion: Avascular AVN of the hip is typically associated with exogenous glucocorticoid treatment. Spontaneous resolution of osteonecrosis of the femoral head can occur. The factors revealed in the literature that appear to be related to resolution are early, asymptomatic disease and small lesion size. This patient had a symptomatic necrosis with a Ficat III on the left hip that spontaneously got better clinically and radiographically. Large scale prospective studies are required to study the MRI after taking corticosteroids and to investigate the relationship between the progression of the disease and the possibility of its spontaneous resolution.

PO5 Hip preserving surgery

PO5-401

SUBTROCHANTERIC SHORTENING OSTEOTOMY IS POSSIBLE THROUGH DIRECT ANTERIOR APPROACH

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Introduction/objectives: One of the most challenging issues in performing Total Hip Arthroplasty (THA) in crowe type 4 developmental hip dysplasia (DDH) is how to transfer such a high ridged centre of hip rotation to an anatomic position. Subtrochanteric femoral shortening through posterior or lateral approach is the technique of choice for this problem. In this abstract we described our stepwise method in subtrochanteric femoral shortening technique through direct anterior approach.

Methods: between January 2015 to January 2018 we performed 18 types 4 DDH in 16 patients (2 bilateral) through direct anterior approach including transverse subtrochanteric femoral shortening. We have introduced our stepwise procedure for such a shortening osteotomy through direct anterior approach. Patients were followed at 1st, 4th, 12th weeks, control radiograph were done at 4th and 12th weeks.

Results: Out of 18 osteotomy site united at 12th week follow up, 2 osteotomy sites united at 8 months and 1 patient experienced nonunion but ignored another surgery of course she had mild pain at nonunion site. We had 3 dislocations during admission that 2 of them underwent close reduction and they continue with stable joint but 1 out of 3 experienced recurrent dislocation because of poor restoration of medial offset that had reviewed. We had no infection, no DVT/SoR around complication.

Conclusion: With this stepwise procedure for proximal subtrochanteric femoral shortening, one who is experienced in direct anterior THA in difficult primary cases, can benefit from several advantages including operation will done in supine position and length control (after shortening osteotomy) can be done, posterior soft tissue almost remain intact and with properly oriented components guarantee posterior stability.

PO5-154

CERCLAGE WIRE FIXATION OF TROCHANTERIC OSTEOTOMIES IN HIP REPLACEMENTS, OUR EXPERIENCE AND COMPARISON WITH PLATE/STAPLE FIXATION.

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Introduction/objectives: The aim of our study was to compare clinical and radiological results of a greater trochanter osteotomy that has been fixed using cerclages with the ones fixed with plates/staples as well as to describe the technique of the combined double supratrochanteric cerclage.

Methods: A retrospective study was performed at Hospital Clinico San Carlos in Madrid between 2002 and 2017 including 51 trochanteric osteotomies of hip replacement surgeries with and at least 1 year of follow-up, 23 were fixed with cerclage and 28 with a Dall-Mini® (Stryker) staple or Cable-Ready plate (Zimmer). We evaluated radiological (consolidation, osteolysis adjacent to the fixation materials and migration of the greater trochanter) and clinical (pain in the greater trochanteric area and Trendelenburg gait) results. Statistical analysis was performed with SPSS15 using the Chi-square test and Mann-Whitney.

Results: 25.0% of the plates/staples group did not obtain consolidation compared to 21.7% of the cerclages (p=0.785) and osteolysis was detected in 32.1% vs 8.7% (p<0.04). Trendelenburg gait was detected in 35.7% of the plate/staples vs 10.2% of the cerclages (p<0.04). 14.2% of plates/staples had to be removed due to pain vs 0% of cerclages (p=0.05). Mean follow up was 44.4 months (range 12-175).

Conclusion: In our series, the fixation of a greater trochanter osteotomy with cerclages improves the clinical and radiological results, however a greater number of patients would be necessary in order to confirm these results.
Case Study: Background: Periacetabular osteotomy (PAO) described by Ganz et al. (1988), is worldwide recognized surgical procedure to treat symptomatic DDH. Many patients complain hip pain and instability, which can limit participation in sports. Data regarding return to athletic activity or sports participation after this procedure are still limited. Objectives: Determine clinical and functional outcomes by means of the use of this technique in young athletes.

Study Design & Methods: Institutional database identified 43 sport players treated with PAO in the period of time from 2007 to 2015. All patients were monitored prospectively, postoperatively, yearly and at the latest follow-up. Wilcoxon test was used for statistical analysis (SPSS 13). A p<0.05 value was considered to be statistically significant.

Results: This study included 43 patients (24 hips; 19 males and 24 females), mean age of 25 years (CI95% 19.47-26.69). Average follow-up was 32.45 months (CI95% 31.58-33.32). CI angle had a mean of 18.22º preop and 35.72º postop, (p<0.001). AI angle had a mean of 17.97º preop, and 5.4º postop, (p<0.001). WOMAC and NAHS scores improved from preop activities.

Conclusions: Improvement in clinical and functional outcomes can be expected after PAO, athletes were able to return to preop activities.

P05 Hip preserving surgery

P05-397 RETURN TO SPORTS AND ACTIVITY TOLERANCE AFTER PERIACETABULAR OSTEOTOMY
Riba Fernandez, M.*; Cardenas, C.; Bellori, V.; Astaria, E.; Moye, E.; Ramírez, L.; Chacon, G.

P05-47 HIP PRESERVATION SURGERY IN CONDITIONS OF DEVELOPED DYSPLASTIC COXARTHROSIS
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Case Study: Introduction: The significance of pelvic and femoral osteotomies in the condition of developed arthrosis is still disputable. Early osteoarthritis and dis-congruency of the articular surfaces are evaluated by many specialists as contra-indication for the joint preserving operation. Purpose: Review medium term results of reconstructive treatment in adolescents and young adults with dysplastic coxarthrosis.

Materials and methods: Treatment outcomes of 26 patients with dysplastic coxarthrosis were analyzed. Mean age at intervention was 16 years (14-32). The grade of arthrosis in joints was assessed according to Tonnis: I - 13, II - 10, III - 3. The type of congruence of articular surfaces were assessed according to Coleman: III - 11, IV - 15. All subjects underwent extraarticular hip reconstruction with the Ilizarov apparatus.

Results: Outcomes were followed from 5 to 12 years. Functional outcomes according to Merle d’Aubigné-Postel were: Pain 4,7±0.1 points, ROM - 4,1±0.2 points. Radiographic findings according to Severin were: IIA - 14, IIB - 8, III - 4; according to Coleman: I - 5, II - 2, III - 8, IV - 4. The grade of arthrosis was unchanged in 20 cases, progressed one grade in 2 joints, reduced in 4 cases.

Conclusions: Application of reconstructive operations with Ilizarov frame allows to extend fairly the indications for extraarticular reconstructive invasions in dysplastic coxarthrosis. Improved congruence of the articular surfaces in conditions of osteoarthritis in most cases leads to a slowing of progression.
Introduction/objectives: The use of an antibiotic cement spacer is a frequent used tool in two-stage revision of a PJI. Often pre-fabricated spacers or spacer moulds are used in standard sizes. As an alternative the spacers are adjusted based on bone cement by hand, or formed completely by hand to fit the patient’s needs. Frequently seen spacer complication is breakage or luxation which may be due to extra resection or inadequate dead space filling is a thing of concern. A patient specific hip cement spacer, mimicking the extracted prosthesis implant, may reduce this problem. The aim was to create a 3D printed mould which can be used intraoperatively for the spacer production.

Methods: A 3D model of the desired spacer was made using segmenting and 3D graphics software, based on a CT scan. Then a mould was generated, 3D printed in biocompatible and ISO certified polyamide and sterilized afterwards. In the OR a backbone of Steinmann’s pen was formed, placed in the mould and this was filled with bone cement. After hardening and removal of the mould, the spacer was implanted in the patient after removing the primary implant and extensive debridement.

Results: The mould produced a spacer matching the planned dimensions. Implantation gave a stable result, good dead space filling, while mimicking the previous anatomy. With 3D software at our disposal, the costs of a mould lies around the €100,- which is lower than commercially available spacers.

Conclusion: The use of a 3D printed mould is a useful and cost effective technique in creating a patient specific hip spacer as part of the 2-stage revisions in PJI treatment, possibly reducing the incidence of spacer complication or loss of bone-stock.
Methods: From 2014 to 2016, 209 consecutive total hip arthroplasties including 85 with neither tranexamic acid nor vancomycin, 59 with tranexamic acid, and 65 with tranexamic acid and vancomycin were performed in a tertiary center.

Results: There were no differences between the three groups of total hip arthroplasties before the operation (preoperative hematocrit, preoperative platelets, BMI, age, use of anticoagulants). Hematocrit, hemoglobin and platelets dropped significantly from preoperatively to postoperatively (first and third day) (Tukey HSD test <0.05) in all groups. However, the decrease of the hematocrit in the no treatment group (-10%) was greater than the other two treatment groups (-7.3% and -7.5%) (Tukey HSD test <0.05). Hemoglobin also decreased more in the no treatment group (-2.8 gr/dl) compared to the other treatment groups (-2.5 gr/dl and -2.4 gr/dl) (Tukey HSD test <0.05). There was no difference in the complications between the three groups (infection, thrombotic events) (-2.5 gr/dl and -2.4 gr/dl) (Tukey HSD test <0.05). There was no difference in the complications between the three groups (infection, thrombotic events). Hemoglobin also decreased more in the no treatment group compared to the other treatment groups (Tukey HSD test <0.05). Hemoglobin also decreased more in the no treatment group compared to the other treatment groups.

Conclusion: The topical use of tranexamic acid and vancomycin powder in total joint arthroplasty did not alter the antifibrolytic effect of the former.
Introduction/objectives: Prosthesis-related infection is a serious complication for patients after orthopedic joint replacement, specifically in total hip arthroplasty. Prosthesis-related infection is difficult to treat with antibiotic therapy. So, in most cases, removal of the infected prosthesis is the only solution to cure the infection. In this study we compared the results of using or not using local antibiotic for prevention of prosthetic joint infection.

Methods: We performed a retrospective chart review of 812 patients underwent total hip replacement surgery in Eran, Mard and Amintamomrneh during 2010-2016. The groups were broken down into patients who received local antibiotics (n=426) versus those who did not (n=386) to compare the occurrence of prosthetic joint infection rate. Data were entered in SPSS software ver 16.0 and analyzed. P value lesser than 0.05 considered as significant.

Results: The mean age of participants was 53.76±11.37 years old and majority of patients was female (57.88%). There was no difference of age and body mass index in both groups (P=0.05). Number of patients with wound infection was 16 patients in using local antibiotic (3.75%) and 40 patients in non-using local antibiotic (12.4%). The difference between two groups was not significant (P=0.005). Patients receiving local antibiotics had similar blood urea nitrogen and creatinine levels postoperatively compared to the no antibiotic group.

Conclusion: We showed that administration of local antibiotics trended towards a preventative effect for PJ in THA patients but was not statistically significant. While the use of local antibiotics may prevent PJ, more data is required especially in the revision arthroplasty groups as clinical trial studies.

Conclusion: The functional articulating spacer is a safe alternative to prefabricated antibiotic-loaded spacers for infection prevention during two-stage revision hip arthroplasty. Mean follow-up was 37 months.

Results: Seventy patients could be retrospectively included in the study, of which we treated fifteen patients with a polimicrobial infection. Four patients had a polymicrobial infection.

Conclusion: Functional articulating spacers are a safe alternative to prefabricated antibiotic-loaded spacers for infection eradication and provide improved patient reported outcome and less complications compared to prefabricated spacers.

Introduction/objectives: Two-stage arthroplasty for coagulase-negative staphylococcal periprosthetic joint infection of the hip has been described in recent years. We evaluated the infection eradication rate after two-stage revision arthroplasty for coagulase-negative staphylococcal infection of the hip treated with two-stage revision between 2003 and 2016. Primary outcome was absence of infection at final follow-up.

Methods: This study retrospectively included all patients treated with coagulase-negative staphylococcal infection of the hip treated with two-stage revision between 2003 and 2016. Primary outcome was absence of infection at final follow-up.

Results: We retrospectively included twenty-nine patients in the study, of which ten patients initially had a fractured femoral neck. Four patients had a polymicrobial infection.

Conclusion: Hip fracture patients seem to be at increased risk of periprosthetic joint infection after hip arthroplasty. Polymicrobial infection did not influence infection eradication rate. Coagulase-negative staphylococcal periprosthetic joint infections of a hip prosthesis can often be difficult to treat. Acceptable infection eradication rate can be achieved with two-stage revision hip arthroplasty.
Introduction/objectives: The Girdlestone resection arthroplasty (GRA) is the last option for eradication of a prosthetic joint infection of the hip. This procedure negatively impacts functional outcome and hypothesis also diminishes health status and quality of life. There are no known studies focusing on quality of life after GRA. We aim to compare patients with a Girdlestone situation after an infected total hip prosthesis with a normative population with regard to health status (HS) and quality of life (QoL).

Methods: We performed a multicenter cross-sectional study at the Departments of Orthopedics in three Dutch training hospitals. Participants completed the World Health Organization Quality of Life (WHOQOL-BREF) and the EQ-5D. Scores were compared with Dutch normative data and specified disease entities.

Results: In total, 63 (67%) patients who underwent GRA between 1-1-2000 and 1-3-2017 completed the questionnaire. Mean WHOQOL-BREF domain scores were 11.3 (standard deviation (SD) = 1.8) overall quality of life, 11.4 (SD = 2.0 (psychical health), 12.9 (SD = 2.1 (psychological health), 13.4 (SD = 2.9 (social relativeness), and 13.1 (SD = 2.2 (environment). Mean EQ-SD scores were 2.1 (SD = 0.5 (mobility), 2.0 (SD = 0.7 (self-care), 2.3 (SD = 0.7 (usual activities), 2.0 (SD = 0.6 (pain/discomfort), 1.7 (SD = 0.7, and mean EQ-SD index score was 0.4 (SD = 0.3. All scores were significantly lower than Dutch normative scores and even lower than known scores for patients with a Girdlestone situation after an infected hip prosthesis. They were significantly lower than Dutch normative scores and even lower than known scores for myocardiatal infection or lower leg amputees.

Conclusion: Patients’ health status and quality of life are grossly impaired in patients with a Girdlestone situation after an infected hip prosthesis. They were significantly lower than Dutch normative scores and even lower than known scores for myocardiatal infection or lower leg amputees.

Introduction/objectives: Highly crosslinked PE performs better in laboratory testing on wear. However not much RFA studies proves whether this holds true in vivo. In order to compare wear rates, a single center RFA, prospective double blind randomized controlled trial was conducted. The primary objective is to investigate the difference in wear at a 60 months interval between the two types of PE by means of RFA.

Methods: Fifty-one patients were randomly assigned to receive either a highly cross linked polyethylene or standard polyethylene acetabular cup with a metal head. Intraoperative identification of an anterior ridge acetabular fracture and a souciad region with which fluid anterior to the hip joint. The anatomopathological examination of the tissue revealed an inflammatory response with metallic particles.

Results: No complications after surgery and in 1 year follow up patient referred no pain in the right hip, making her daily life activities without restrictions. No complaints in the left hip with 4 years follow up.

Conclusion: Some reports exist of this reactions in non-MoM articulations in THA, identifying trunnion wear as a source of metal ions. Therefore we conclude that also in vivo highly crosslinked PE is more wear resistant.
P07 Metal ion release and tribology

P07-119
TRUNNION FractURE FOLLOWING TOTAL HIP ARTHROPLASTY
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Case study: Trunnion fracture following total hip arthroplasty (THA) is an uncommon complication. We present the case of a 72-year-old female who underwent THA in 2008 with a good initial result. She presented 9 years later with sudden onset of left hip pain when getting up from a chair and difficulty weight bearing. Radiographs revealed a fracture of the femoral prosthesis at the head-neck junction.

Intraoperatively, the femoral prosthesis showed marked trunnionosis with metallosis of the surrounding tissues. The polyethylene liner was seen superiorly however the unmounted acetabular component was well fixed. The femoral stem, which was an Acceletak system with a 360-thread CoCr head and has an ODPEP rating 104°F, was well fixed in situ. Therefore, an extended trochanteric osteotomy and revision to a long stemmed uncemented prosthesis was performed. Post-operative recovery was uneventful.

This case report highlights the rare but important complication of trunnionosis. It has seen a rise in incidence due to the introduction of modular designs that introduce a site of increased wear and metallosis by 2.4.

Fracture of the trunnion itself has rarely been reported. 6. Sparyer et al identified 3 patients with fracture of an Acceletak stem, all in male patients weighing more than 90kg and therefore fatigue loading may have been a significant factor. Our case, in contrast, is a female patient weighing 67kg. Cause is likely to be multi-factorial with factors such as corrosion at the head-neck interface and malpositioning of the prosthesis playing important roles in this case of prosthetic failure.

P07 Metal ion release and tribology

P07-334
METAL SENSITIVITY IN PATIENTS AFTER TOTAL HIP REPLACEMENT - CASES REPORT
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Case study: Introduction. In 70’s numerous papers were published, reporting metal sensitivity in patients after total hip or knee replacement. The rate of patients reporting metal sensitivity dropped significantly during the years, but still remain one of the reasons for early prosthetic loosening according to the European and Australian registries. Objective. To remind the audacity about the metal sensitivity, by presenting two patients with Ni allergy after total hip replacement.

Methods: Between 2013 and 2017, two patients are retrospectively followed up for developing metal allergy to Ni after total hip replacement. The implant of choice in both of them, was cementless cup and cementless stem. Both of them were patch tested and allergy to Ni was confirmed.

Results: Both patients are closely monitored in 6 months intervals and still there is no evidence of prosthetic loosening.

Conclusion: Metal sensitivity nowadays is a rare event using modern hip endoprostheses. According to the literature if a metal allergy occurs the average life of the implant diminish from 120 months to 78 months. Patients should be patch tested to determine the allergens. The treatment is mainly conservative, but if a severe allergic reaction occurs or the prosthesis is loosened is is wise to be replaced with an implant that doesn’t contain metals that causes allergic reaction.

P08 New technologies

P08-210
VALIDATING THE ACCURACY OF A NOVEL COMPUTER-ASSISTED SYSTEM USING TWO-DIMENSIONAL AND THREE-DIMENSIONAL RADIOGRAPHIC ANALYSIS
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Introduction/objectives: New navigation devices have been designed to improve a surgeon’s accuracy in positioning total hip arthroplasty (THA). The purpose of this study was to evaluate the accuracy of intra-operative values for leg length (LL), offset, inclination and version determined by the computer-assisted system (CAS).

Methods: 100 primary THA patients were prospectively enrolled from November 2016-March 2017 to assess intra-op accuracy and reliability of the CAS. Patients with pre-existing implants, post-traumatic arthritis, contralateral hip arthroplasty, septic arthritis, or previous hip fracture were excluded. Data was evaluated using post-operative biplanar 3D reconstructions of the pelvis and femur. Ein Bild Roentgen Analyse (EBRA) software and 3D imaging were used to measure acetabular cup version and inclination.

Results: Average absolute difference between intra-op and EBRA post-op measurements were 3.64°± 2.9° for acetabular inclination and 3.7°± 4.5° for acetabular version. The average absolute difference between intra-op and 3D imaging was 1.05°±0.9° for inclination and 3.26°±3.11° for anteversion. Mean absolute error in LL was 4.3±3.73 mm comparing intra-op and 3D post-operative measurements vs 3.6± 1.8 mm for intra-op and 3D measurements. The root mean square (RMS) error for cup inclination using EBRA was 2.7° and anteversion was 4.09°. The RMS error with EOS was 2° of inclination and 3.71° of anteversion. There were no post-operative dislocations at 6 weeks follow-up.

Conclusion: The use of CAS demonstrated high reliability and accuracy in acetabular and femoral component position and orientation as well as leg length. It provides an additional intra-operative tool for surgeons to improve THA and enable real time navigational values.
Introduction/objectives: To evaluate the ability of robotic assisted technology to accurately report femoral component anteversion as compared to manual goniometer measurement of femoral anteversion.

Methods: Twenty patients underwent a MAKO robotic assisted total hip arthroplasty. Manual broaching was performed in what the surgeon perceived to be the appropriate anteversion for the patient. The final implant in place, anteversion was then measured manually with a goniometer, and then with the MAKO system. After surgery, postoperative CT scans were performed and femoral anteversion was measured by an independent evaluator.

Results: Mean femoral anteversion measured using the goniometer was 18.9±6.1 degrees, with the MAKO 9.3±5.9 degrees, and CT measurements 9.3±6.0 degrees. There was a strong relationship between the CT measured anteversion and MAKO measured version (p=0.0001). A poor relationship was found between the CT measured femoral and the manually measured femoral anteversion (p=0.67).

Conclusion: Use of the MAKO robotic system reliably measured the femoral stem anteversion intraoperatively as confirmed by independent postoperative CT measurements. Manual intraoperative goniometer measurements do not accurately measure femoral anteversion.

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Conclusion: Use of the MAKO robotic system reliably measured the femoral stem anteversion intraoperatively as confirmed by independent postoperative CT measurements. Manual intraoperative goniometer measurements do not accurately measure femoral anteversion.
P09 Patient management

P09-576

SELF-WARMING BLANKET VS FORCED-AIR WARMING IN PRIMARY KNEE OR HIP REPLACEMENT: A RANDOMISED CONTROLLED NON-INFERIORITY STUDY

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Introduction/objectives: After primary total knee/hip replacement a prostatic joint infection could develop. Hypothermia could raise the risk of infection. Heating by forced-air can disrupt laminar air flow in the operation room (OR), potentially raising the risk of infection. We aimed to study non-inferiority of an active self-heating blanket compared to a forced-air blanket in preventing hypothermia.

Methods: A randomized controlled non-inferiority trial (N=86 patients) was performed comparing a self-heating blanket (SHB) versus a forced-air blanket (FAB) in elective primary TKR/THR patients. Primary outcome was lowest measured temperature during surgery. Secondary outcomes were patients' core temperature before, during and after surgery, thermal comfort visual analogue score (VAS) and complications during hospitalization.

Results: Lowest measured temperature was 35.9°C(±0.8) in SHB and 36.1°C(±0.5) in FAB group (p<0.05). No significant correlation was found with duration of surgery or temperature of the OR. No significant difference in core temperature was found before surgery (SHB 36.8°C(±0.4), FAB 36.5°C(±0.3), p=0.48), after induction of anesthesia (SHB 36.6°C(±0.3), FAB 36.7°C(±0.5), p=0.22) nor as a mean during surgery (SHB 35.9°C(±1.6), FAB 36.0°C(±1.3), p=0.68). SHB patients were colder at the recovery bay. 35.8°C(±0.5) compared to FAB patients, 36.1°C(±0.5) (p=0.04). Mean VAS thermal comfort was 53.3(15.7) in SHB and 53.2(12.3) in FAB patients. No difference in complication rate was found.

Conclusion: In this study neither kind of the warming blanket prevented perioperative hypothermia. Although a difference of 0.2°C was found between both groups at the end of TKR/THR surgery, this is most probably not clinically relevant. Complication rate in both groups was the same.

P09 Patient management

P09-285

COMMUNICATION, COPING, AND CLINICAL STATUS: A HOLISTIC PERSPECTIVE ON TJA PATIENTS TO IMPROVE SATISFACTION

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Introduction/objectives: Introduction. Despite good functional outcomes, up to 30% of patients report dissatisfaction after total joint arthroplasty (TJA). Satisfaction may improve if care provision is tailored to specific patient subgroups. Objectives. The aim of the current study was to define patient subgroups from a biopsychosocial perspective by assessing patients' communication, coping, and clinical characteristics.

Methods: Methods. In a single-centre retrospective study, we assessed the preoperative clinical status, coping behaviour and communication preferences of 191 patients (70.6 ± 8.7 years, 61.5% female) that had received primary TJA. Subgroups were identified using hierarchical and k-means cluster analyses. The cluster solution was validated in two multivariate analyses that compared subgroups on 1) characteristics and 2) postoperative outcomes and satisfaction. A decision tree for patient classification was developed using recursive partitioning (machine learning).

Results: Results. Three subgroups were identified that differed in outcomes (p<0.006). Cluster 1 (44%) had an overall lower clinical status, preferred personal communication, and was less satisfied with outcomes. Cluster 2 (32%) was characterized by better clinical status, less pronounced communication preferences, and high satisfaction. Cluster 3 (24%) was characterized by higher age, higher anxiety, lower self-efficacy for communication, and lower satisfaction with communication. Using 3 questions, future patients can be classified with 70% certainty.

Conclusion: Conclusions: A holistic perspective on patients may be required to understand dissatisfaction with TJA. The identified subgroups provide direction for tailored care provision, such as patient education and pain coping skills training.

P09 Patient management

P09-200

IT POSSIBLE TO REDUCE THE COST AND LENGTH OF STAY FOR INTRAOPERATIVE NECK OF FEMUR FRACTURES?

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Introduction/objectives: We sought to establish whether procedure choice (hemiarthroplasty vs THR) for patients with a fracture to the neck of femur (NOF) affects the length of stay at our institution. We sought to determine the economic impact of this choice.

Methods: Methods. All patients presenting to our institution with a NOF fracture were identified retrospectively. Those with an American Society of Anesthesiologists (ASA) score ≥2, and Abbreviated Mental Test Score (AMTS) <8 were included. Patients were matched according to their comorbidities. Postoperative length of stay was deduced from hospital notes and data compared for the 2 populations.

Results: Results. 37 patients were included in this study. Average length of stay for patients was 9 days and 18 days for THR and hemiarthroplasty patients respectively. This may save approximately 126 bed days for the 14 fractured NOF patients who received hemiarthroplasty when they were eligible for THR. Using an estimated cost per bed day of £400, this is a potential saving of £50,400 per annum.

Conclusion: THR for management of displaced intra-articular NOF fracture reduces the average length of stay of patients compared to management using hemiarthroplasty. At our institution, this represents a saving of 126 bed days annually, equating to £50,400. Opting to manage active elderly patients presenting with a fractured NOF with THR as opposed to hemiarthroplasty is one technique of tackling the bed crisis faced by the NHS. Our study is limited by the small cohort size, and the utilisation of only short-term outcomes for cost analysis. Further study is required to fully characterise the cost-benefit THR management for fractured NOF patients offers compared to hemiarthroplasty.

P09 Patient management

P09-508

TRANSFUSION RATE USING INTRAVENOUS TRANEXAMIC ACID IN HP REVISION SURGERY

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Introduction/objectives: Hip revision surgery is associated with a high probability of the necessity for a blood transfusion. Different studies support the use of tranexamic acid (TXA) to decrease the rate of transfusions in primary hip surgery. Nevertheless, the use of this drug in hip revision surgery has not yet been widely accepted. The aim of our study was to establish the rate of blood transfusion with and without TXA in hip revision surgery.

Methods: Methods. We retrospectively studied 125 hip revision surgery patients operated on between 2011 and 2014. We divided our series into 2 groups: the TXA group with 61 patients (in which a 1000 mg dose of TXA was used before the skin incision) and a second identical dose after skin closures) and a control group with 64 patients. We analysed the red blood cell (RBC) transfusion rates and their odds risk as well as the presence of collateral complications.

Results: Results. Average RBC transfusion was 2.7 units/patient (range 0-6) in the control group compared to 1.6 units/patient (range 0-6) in the TXA group. A 90.1% (odds ratio OR) 0.030, confidence interval [1.022:0.034, p=0.003] odds risk reduction for transfusion of at least 1 unit of erythrocyte blood cell was observed in the TXA group. Complications associated with the TXA were similar in both groups.

Conclusion: The benefits of TXA have been shown in elective hip replacement. In this study, TXA proved to be safe and efficacious in reducing the need for transfusions following revision total hip arthroplasty.
P09 Patient management

P09-040
TRANEXAMIC ACID AND LOWERING PERIOPERATIVE BLOOD LOSS IN TOTAL HIP ARTHROPLASTY
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Introduction/objectives: There can be considerable blood loss per operation of total hip arthroplasty requiring blood transfusion, considering transfusion could accompany much cost and serious risks and complications. We design this cohort to evaluate does tranexamic acid (TXA) induce blood loss and subsequently blood transfusion.

Methods: 45 patients were randomly divided into control and TXA groups. In the TXA group, a single injection of 15mg/kg TXA on operation table before surgical incision and, we had 90 patients in control group. Total blood loss was calculated from haemoglobin(Hb) balance preoperatively and post operation day(POD) 1 and 3. Intraoperative blood loss was estimated volumetrically and visually from bloody guazes. Both groups received Aspirin as anticoagulation medication. All operation performed from minimally invasive direct anterior approach.

Results: With the threshold of Hb under 8 g/dl for transfusion there were no blood transfusion in TXA group compared to 8 patients in control group. Mean Intraoperative blood loss in TXA group was 500cc(200-750cc) and we had 2g/L reduction in Hb concentration(1-4g/L) compare to 800cc(500-1100cc) blood loss and 4g/L(2-4g/L) reduction in Hb in control group. No thromboembolic complications occurred in both groups.

Conclusion: In light of great potential of TXA in lowering blood loss and need for transfusion in total hip arthroplasty and considering its cost we recommend for routine use of TXA in total hip arthroplasty patients.

P09 Patient management

P09-461
TREATMENT OF HEPATITIS C VIRUS MAY IMPROVE OUTCOMES IN TOTAL HIP ARTHROPLASTY RECIPIENTS
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Introduction/objectives: As the chronically infected HCV population ages, the demand for total hip arthroplasty (THA) will increase. Previous reports demonstrate that HCV infection may predispose patients to inferior postoperative outcomes following THA. No study to date has evaluated surgical outcomes in THA recipients that have been successfully treated for HCV. The purpose of the current study was to evaluate surgical outcomes following THA in patients that have been successfully treated for their HCV infection compared to patients that did not receive treatment.

Methods: A retrospective review of all patients diagnosed with HCV that underwent primary unilateral and bilateral THA between January 2006 and April 2017 was conducted. Patients were divided into two cohorts: (1) patients that received treatment for HCV (HCV-T) and (2) patients that did not receive treatment for HCV (HCV-NT). All patients variables including demographics, HCV infection characteristics, operative details, in-hospital complications, clinical follow-up, and revisions were carefully studied.

Results: 26 patients (32 hips) were in the HCV-T cohort, and 32 patients (38 hips) were in the HCV-UT cohort. Mean age at surgery was 59.5±7.3 and 60.0±10.2 years in the HCV-T and HCV-UT cohorts, respectively. Mean follow-up time was 26.3±23.4 and 31.7±28.3 months in the HCV-T and HCV-UT cohorts, respectively. There were significantly more in-hospital complications (p=0.01) and more patients required THA (p=0.04) in the HCV-UT cohort compared to the HCV-T cohort, respectively.

Conclusion: Treatment of HCV prior to primary THA can reduce the incidence of in-hospital complications and need for revision THA. HCV treatment regimens should be a part of patient optimization prior to THA.
**Introduction/objectives:** Presentation of influence of tranexamic acid (TXA) in perioperative blood loss control in hip hemiarthroplasty surgery.

**Methods:** From 2013 until 2016, 322 patients (group A) undergoing THR were enrolled in this prospective study to compare 24 patients without TXA (control group) with 29 patients with TXA (TXA group). TXA (1 gr TXA 20 min preoperative & 1 gr TXA during wound closure) was administered to 28 patients with TXA (control group). Hemoglobin levels drop, drainage volume and need for transfusion were measured in both groups.

**Results:** No statistically significant difference was found between 2 groups for age, sex, BMI, surgery duration, anesthesia, hospitalization, Hb and platelet count. TXA group showed significantly smaller hemoglobin drop than control group (6.86% vs -11.82% at 12h post-op, -10.16% vs -21.87% at 24h post-op p<0.05). Drainage volume at 24 h post-op was 226.3ml vs 92ml for control and TXA group respectively. 13 patients in control group needed transfusion with 21 units of packed red blood cells PRBC vs 5 patients with 8 units of PRBC in total in TXA group. No deep venous thrombosis or pulmonary embolism appeared in TXA group.

**Conclusion:** Intravenous administration of TXA in hip hemiarthroplasty for femoral neck fracture is a very effective, easy and safe method to reduce perioperative blood loss and need for transfusion.

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**Introduction/objectives:** Assessment of the impact of an accelerated recovery program in THA.

**Methods:** In 2013 an accelerated recovery program was introduced for primary total hip arthroplasty in an university hospital. The program included a multidisciplinary approach with the use of regional anesthesia, periarticular infiltration, systematic use of tranexamic acid, abbreviated fast, and multimodal analgesia. Hemoglobin, inflammatory parameters, pain and post-rehabilitation was studied to measure the impact of the aforementioned program in hip surgery.

**Results:** In 2013 until 2016, 322 patients (group A) undergoing THR were enrolled in this prospective study to examine the efficacy of an accelerated recovery program. The control group (B) consisted of 286 patients with same inclusion criteria operated prior to 2013. Outcome variables were: days of hospitalization, prolonged hospitalization, (greater than 3 days), poor control of pain, (requirement of an additional analgesic compound), re-hospitalizations, hospitalization, need for re-hospitalization and pain and post intervention study was carried out to measure the impact of the aforementioned program in hip surgery. In 2013 until 2016, 322 patients (group A) undergoing THR were enrolled in this prospective study to examine the efficacy of an accelerated recovery program. The control group (B) consisted of 286 patients with same inclusion criteria operated prior to 2013. Outcome variables were: days of hospitalization, prolonged hospitalization, (greater than 3 days), poor control of pain, (requirement of an additional analgesic compound), re-hospitalizations, hospitalization, need for re-hospitalization and pain.

**Conclusion:** The construction of multimodal accelerated recovery programs allowed to improve the pain control, reduce the days of hospitalization, and decrease the number of annual bed days used even in ASA III patients.

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**Introduction/objectives:** Presentation of influence of tranexamic acid (TXA) in perioperative blood loss control in hip hemiarthroplasty.

**Methods:** 29 patients underwent a total hip arthroplasty with intravenous administration of TXA (1 gr TXA 20 min preoperative & 1 gr TXA during wound closure) and were compared to 28 patients without TXA (control group). Hemoglobin levels drop, drainage volume and need for transfusion were measured in both groups.

**Results:** No statistically significant difference was found between 2 groups for age, sex, BMI, surgery duration, anesthesia, hospitalization, Hb and platelet count. TXA group showed significantly smaller hemoglobin drop than control group (6.15% vs -18.02% at 12h post-op, 13.25% vs -22.44% at 24h post-op p<0.05). Drainage volume at 24 h post-op was 288.5ml vs 111.5ml for control and TXA group respectively. 15 patients in control group needed transfusion with 24 units of packed red blood cells PRBC vs 8 patients with 9 units of PRBC in total in TXA group. No deep venous thrombosis or pulmonary embolism appeared in TXA group. 2 patients of TXA group developed acute myocardial infarction one week after discharge and one of these passed away.

**Conclusion:** Intravenous administration of TXA in total hip arthroplasty is a very effective, easy and safe method to reduce perioperative blood loss and need for transfusion.

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**Conclusion:** The construction of multimodal accelerated recovery programs allowed to improve the pain control, reduce the days of hospitalization, and decrease the number of annual bed days used even in ASA III patients.
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**P09-370**

*DOES TRANEXAMIC ACID REDUCE THE INCIDENCE AND GRADE OF HETEROTOPIC OSSIFICATION FOLLOWING PRIMARY THA?*

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**Introduction/objectives:** Heterotopic ossification (HO) represent one of the most frequent complications following total hip arthroplasty (THA) with a reported incidence of up to 42% in recent studies. The purpose of our study was to investigate the influence of intravenous (IV) application of tranexamic acid (TXA) on the incidence and grade of HO following primary THA.

**Methods:** A retrospective study (level III) was performed on 256 female and 184 male patients (468 THPs) of those 28 bilateral patient who underwent primary THA performed by the same surgical team between 2012 and 2017 and that had available 12 months postoperative radiographs. In 215 (46%) cases TXA IV was administered perioperatively and after 6 hours. In 253 (54%) cases TXA was not used. Brooker classification was used to evaluate the ossifications and the difference in Brooker scores was calculated (dBrooker). Ordinal regression model was used to estimate the effects of TXA as well as patients’ age, gender, surgical approach (anterior, direct lateral), type of implant (Zimmer Allodisc, DePuy Corail) and use of local infiltrative analgesia (LIA) on the incidence of HO.

**Results:** Patients who received TXA showed lower dBrooker score in comparison to non-treated patients but the difference was not statistically significant (p=0.34). Only gender (p=0.01) and age (p=0.01) demonstrated positive correlation with dBrooker, indicating that younger patients and women were less inclined to HO formation following primary THA. Other analyzed factors had no influence on incidence and grade of HO.

**Conclusion:** Although TXA reduces blood loss it does not seem to lower the incidence of HO. The incidence and grade of HO following primary THA were significantly lower in younger patients and women.

**P09-458**

*LOCAL TRANEXAMIC ACID PLUS DILUTED EPINEPHRINE VS INTRAVENOUS TRANEXAMIC ACID FOR REDUCING BLEEDING IN REVISION TOTAL HIP ARTHROPLASTY*

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**Introduction/objectives:** Total joint replacement surgery is associated with large amounts of blood loss and significant rates of transfusion. Postoperative bleeding is one of the most important problems after major orthopedic surgeries including revision Total Hip Arthroplasty (THA). It has been demonstrated that tranexamic acid is a useful agent to control the volume of blood loss. However, the more effective route of TXA administration remained controversial.

**Methods:** In current study, we compared the effects of local and intravenous (IV) administration of TXA on need to blood transfusion and hemoglobin drop. We randomized 80 patients undergoing revision THA into two groups: local group and IV group. In group IV 40 patients was administrated TXA 4 g alone systemically and in local group - 40 patients the joint was irrigated with 4 g of TXA plus 0.33mg DEP (1:200,000).

**Results:** The level of Hb was measured before and after operation and the rate of Hb drop was compared. Also, the blood transfused were compared in two group. Results showed topical TXA plus DEP substantially reduced total blood loss, hidden blood loss and transfusion rate compared with TXA alone, without increasing the risks of hemodynamic complexity.

**Conclusion:** We conclude that local use of TXA plus DEP was crucially effective and safe option compared with intravenous TXA alone in reducing total and hidden blood loss and transfusion rate following revision THA without considerable complications.

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**P09 Patient management**

**P09-56**

*TOTAL HIP REPLACEMENT SURGERY: EFFECTS OF NEUROMUSCULAR TAPPING ON EDEMA, SWELLING AND HETEROATOMA*

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**Introduction/objectives:** Italy accounts for approximately 100,000 total hip replacement surgery (THR), after France (130,000).

Edema commonly accompanies this surgical procedure, specific treatments may decrease swelling and consequent restrictions on postoperative exercises, speeding recovery and reducing hospitalization costs. As recently suggested by Zeng et al. Edema management commonly includes expensive procedures and expensive resources and materials. The aim of this study is to evaluate the efficacy of the NMT on the incidence of HO in order to reduce the temporary post-surgical insufficiency of the lymphatic system after THR.

**Methods:** Fifty patients (F=29, M=21, mean age= 66.27 +/- 9.8) underwent to a THR were randomly grouped into an NMT application group and no NMT application group. All patients were treated one hour/day for two weeks and evaluated with validated scales (NRS, WOMAC, ROM, MRC) and using lower limb size measured on the third day after surgery, after one week of NMT application, and at discharge.

**Results:** Edema and pain reduction in the experimental group was better than the control group (p<0.01), while there were no significant differences regarding ROM, MFC and WOMAC.

**Conclusion:** In literature there is no unanimous evidence about the efficacy of NMT. In Kalron meta-analysis, a moderate level of evidence in support of a better pain management in patients treated with taping has reported, but no evidence about circumference reduction of limb has been collected. In our study, instead, NMT appeared to be effective on edema secondary to THA surgery, the protocol applied on the experimental group seems to be feasible, cheaper and exportable to other realities.

**P10 Primary THA**

**P10-182**

*DOES THREE-DIMENSIONAL THA PREOPERATIVE PLANNING AID ACETABULAR CUP POSITIONING?*

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**Introduction/objectives:** The present study evaluated the usefulness of CT-based three-dimensional THA preoperative planning for acetabular cup positioning.

**Methods:** This study included 120 hips aged 36~85 years, who underwent primary THA using CT-based THA preoperative planning software ZedHip (LEXI, Japan) and postoperative CT imaging. Preoperatively the optimum cup size and position in the acetabulum were decided using ZedHip, taking into consideration femoral anteversion and to achieve the maximum ROM in dynamic motion simulation. Radiographic inclination (RI) was selected in the range between 40°-45° and radiographic version (RA) in the range between ±1°-2°. Three-dimensional planning images of the cup positioning were obtained from ZedHip, and the distances between the edge of the implant and anatomical landmarks were measured on the three-dimensional images and recorded. Intraoperatively the RI and RA were confirmed by reference to these distances and the acetabular cup was inserted. The difference between the preoperative planning and the actual implant position was measured to assess the accuracy of acetabular cup positioning using ZedHip.

**Results:** Actual cup size corresponded with that of preoperative planning in 95% of cases (114 hips). Postoperative mean RI was 42.3°± 4.2° and mean RA was 16.1°± 5.3°. Deviation from the target RI was 4.2°± 3.7° and deviation from the target RA was 4.0°± 3.1°. Overall 116 hips (96.7%) were within the RA safe zone (35°~ 55°) and 108 hips (90.0%) were within the RA safe zone (5°~ 25°), and 105 hips (87.5%) were within both the RI and RA safe zones.

**Conclusion:** CBCT-based three-dimensional THA preoperative planning is effective for acetabular cup positioning, and has better cost performance than expensive CT-based navigation.
Results: RSA analysis of 33 patients showed a significant proximal-medial migration of 0.25mm and median anteversion-retroversion rotation of 0.4° up to 3 months, after which the stem stabilized and showed no further significant movement. The rate of early revisions is 2 times higher in the younger age group, and the rate of late revisions is 3.7 times higher. The 10-year survival rate in patients under the age of 50 years is 88.5%, and in the older group 96.8%.

Methods: Thirty-five patients were included, four patients were lost to follow-up and two patients were excluded for analysis due to high CN numbers. RSA images were made postoperatively (within 5 days) and at 3, 6, 12 and 24 months.

Conclusion: The CBH stem shows a stable migration pattern after initial settling at three months, predicting satisfactory long-term outcome.

Introduction/objectives: THA is considered as the one of the most effective surgeries in treatment of patients with severe hip joint pathology with survival rate up to 95%. However, in patients of different age groups in the long-term period, the results of joint replacement can vary significantly. The purpose of our study was to assess the long-term results of the THA in patients of different age groups with different level of motor activity and different types of implants.

Results: The mean level of motion activity in the group of young patients was 51.5% and in the older group was 32.5%. The mean level of activity in the young group was 1.5 times higher, depending on the manufacturer. Also, level of linear wear was influenced by several factors - BMI, the angle of the articulating component, but the greatest one was the level of motor activity. The 10-year survival rate in patients under the age of 50 years is 86.5%, and in the older group 96.8%. The rate of early revisions is 2 times higher in the younger age group, and the rate of late revisions is 3.7 times higher.

Conclusion: The rate of early revisions depends on the complexity of the pathology, and rate of late revisions associated with bearing wear, which is most influenced with the level of motor activity of patients.
Introduction/objectives: The total hip arthroplasty leads to a steady increase of the number of surgeries performed anywhere. At the same time increases the number of performed revision surgeries. The causes of failures of THA can be the cup malposition.

Methods: We evaluated cup inclination and anteversion depending on different factors in 1,174 patients (1,408 joints) after primary THA.

Results: With anterolateral approach the incorrect angle of inclination of the acetabular component was observed in 11.2 % and the angle of anteversion in 19.6 % of cases. Analysis of the radiographs of patients operated by different six surgeons performing more than 100 THA per year did not reveal clinically significant differences in the angles of cup inclination and anteversion, with a statistically significant difference. We did not identify correlations between the BMI and cup inclination and anteversion angles, although there was a tendency for more vertical cup positioning with increasing of BMI. The analysis of radiograph measurements of patients with dislocations showed that in most cases the angle of cup inclination and anteversion is within the acceptable limits (76.4 % and 70.9 % respectively).

Conclusion: Factors increasing the risk of malposition were the BMI, MRS and the experience of the surgeon. The analysis of the obtained data did not allow to reveal the direct influence of the cup position on the dislocation rate. The multifactorial causes of hip dislocation requires a more detailed study of additional factors directly or indirectly affecting the functioning of the implant.

Results: Conversion to THA was required in 14 patients (17.94%) at a mean of 26.92 months (4 to 69) with a mean age 51.21 years (21 to 62). X-rays were used to evaluate osteoarthritis (OA) severity done in our institution between June 2010 and January 2017. The group comprised 78 patients (54 men and 24 women) with a mean age 45.21 years (21 to 62). Analysis of the radiographs of patients operated by different surgeons performing more than 100 THA per year did not reveal clinically significant differences in the angles of cup inclination and anteversion, with a statistically significant difference. We did not identify correlations between the BMI and cup inclination and anteversion angles, although there was a tendency for more vertical cup positioning with increasing of BMI. The analysis of radiograph measurements of patients with dislocations showed that in most cases the angle of cup inclination and anteversion is within the acceptable limits (76.4 % and 70.9 % respectively).

Conclusion: Factors increasing the risk of malposition were the BMI, MRS and the experience of the surgeon. The analysis of the obtained data did not allow to reveal the direct influence of the cup position on the dislocation rate. The multifactorial causes of hip dislocation requires a more detailed study of additional factors directly or indirectly affecting the functioning of the implant.

Conclusion: Further studies with long-term follow-up are needed to properly ascertain which factors will determine the functioning of the implant.
P10 Primary THA

P10-39
HIGH FREQUENCY OF RADIO-LUCENCY WITH TRABECULAR METAL PRIMARY ACETABULAR COMPONENT IN SHORT-TERM FOLLOW-UP. Kudrawiec, M. R.; Uchino, Y. R.; Maries, S. R.;Tanaka, T. R. (1) Department of Orthopaedic Surgery, Shimane University, Izumo, Japan; (2) Department of Rehabilitation Medicine, Shimane University, Izumo, Japan

Introduction/objectives: Trabecular metal (TM) component is a novel ultra-light metal substrate with a higher coefficient of friction to enhance interference fit and with ultra-light surfaces to enhance osseointegration. The aim of this study was to investigate bone reaction around the TM cup in the short term.

Methods: This case series study included 50 Japanese patients (50 hips) who underwent a primary total hip arthroplasty with a Continuum acetabular component. The subjects consisted of 15 men and 35 women with a mean age of 70 years. The mean observation period was 41 months (range, 25-53 months). All the components were implanted by using the press-fit technique after under-reaming of 1 mm, guided by a computed tomography-based navigation system. Radiographic evaluation included spot welds (SW), a radiolucent line (RLL), gap filling, and bone grafting on the lateral side of the component at 1 year after surgery.

Results: No evidence of loosening appeared in all the components. One-year radiography revealed good osseointegration; thus, SW was observed in all the components (80% in DeLee zone 1, 68% in zone 2, and 20% in zone 3). On the other hand, a RLL with a sclerotic line appeared in 54% of the cases (8% in zone 1, 38% in zone 2, and 44% in zone 3). None of the cases presented RLL in all the 3 zones. All the initial gaps in the 9 cases were filled with new bone. Monolateral bone graft was carried out in 34 cases that were all well harvested (re-trabecular), and 13 cases (30%) had a RLL with a sclerotic line.

Conclusion: Although the TM acetabular component presented excellent osseointegration, radioluency appeared with high frequency. We assumed that an extremely rigid initial fit by the rim with a high coefficient of friction might lead to a heterogeneous fixation.

P10 Primary THA

P10-196
POST-OPERATIVE RADIOLOGICAL ANALYSIS OF TOTAL HIP REPLACEMENTS AT A NON-PROFIT SURGICAL CENTRE IN CAMBODIA. Kataria, S. R.; Hughes, L. R.; Noor, S. R.; Oy, H. R.; Gobolly, J. R. (1) University of Aberdeen, Aberdeen, United Kingdom; (2) Children’s Surgical Centre, Phnom Penh, Cambodia

Introduction/objectives: To evaluate postoperative radiographs at a Cambodian surgical centre (CSC) following primary total hip replacement (THR) between 2007 and 2017 by visiting foreign surgeons and local surgeons supervised by foreign surgeons. Additionally looking at THRs conducted by local surgeons unsupervised pre and post 2015 to assess surgeons improving their performance with time and training from visiting foreign surgeons. In the majority of parameters, the CSC has successfully established a self-sustainable THR service in Cambodia. Optimal positioning of the femoral component is essential to providing successful patient outcomes and there is strong evidence of local surgeons improving their performance with time and training from visiting foreign surgeons. In the majority of parameters, local surgeons were performing to a similar standard as visiting surgeons. As such CSC serves as an example of what is possible for hospitals in other low and middle income countries.

Methods: Data from digitised AP pelvic radiographs was extracted using ImageJ software for leg length discrepancy, vertical centre of rotation, horizontal centre of rotation discrepancy (HCORD), acetabular inclination, femoral stem positioning and cement mantle thickness. There were four static foreign led (FL), early supervised, early unsupervised (EU) and late unsupervised (LU). Analysis of means was conducted using univariate ANOVA and Sheffe’s test. Studies have shown optimal HCORD to be <= 5 mm.

Results: 51 radiographs were analysed. The EU group had a significantly greater HCORD compared to the FL group (28.26 mm (95% CI: 0.48 - 3.92 %) vs 5.67 mm (95% CI: 4.29 - 7.35 %) (p = 0.037)). There was a significantly improved HCORD in the LU group compared to the EU group (5.67 vs 2.95 mm (95% CI: 1.74 - 4.17 %) (p = 0.035)). There was no difference between the groups in the other parameters.

Conclusion: CSC has successfully established a self-sustainable THR service in Cambodia. Optimal positioning of the implanted components is essential to providing successful patient outcomes and there is strong evidence of local surgeons improving their performance with time and training from visiting foreign surgeons. In the majority of parameters, local surgeons were performing to a similar standard as visiting surgeons. As such CSC serves as an example of what is possible for hospitals in other low and middle income countries.
Introduction/objectives: Operation Walk is an international charity which performs total joint arthroplasty (THA) in third-world countries where these life-saving operations are not available. It was founded in 1998 by Dr Larry Dow in Los Angeles and has expanded to form 15 separate chapters in North America. The first international chapter was formed by our senior author in 2016.

Methods: In March 2017 Operation Walk Ireland sent a team of 60 volunteers to Hospital 108, Hanoi, Vietnam. Following a very successful mission, we sent a second mission back to Hanoi in 2018, to perform THA on patients who would otherwise never receive treatment for debilitating osteoarthritis. We highlight salient differences between respective patient cohorts.

Results: We performed 55 THA over 4 days. When we compare the 38 THA to those most recently performed by our senior author, we find some stark contrasts. In Ireland mean age is 62.2 [M: 63.4, F: 60.1] whereas in Vietnam the mean age is over 13 years younger at 48.7 [M: 49.3, F: 49.3]. Secondly, in Ireland the diagnosis is primarily Osteoarthritis (OA) whereas in Vietnam 65% of THA patients are due to Avascular Necrosis (AVN). Finally, the average shell/stem size in Ireland was 53/6 [M: 55/7, F: 51/3], whereas this is reduced by 2 sizes to 51/4 [M: 52/5, F: 49/2] in Vietnam.

Conclusion: Hanoi 2018 was the second mission that Operation Walk Ireland has sent to Vietnam. We learnt many lessons during our first charity mission in 2017. Teaching as an essential priority and this was reflected in surgical, anaesthetic, ward and physiotherapy teams. Patient characteristics are significantly different from the cohorts with which we are familiar. We note that the Vietnamese BMI of 21.1 is over 7 points less than a typical Irish THA cohort (28.4).

P10 Primary THA
P10-574
PRIMARY HIP SURGERY: OPERATION WALK IRELAND, HANOI 2018, VIETNAM
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Introduction/objectives: Operation Walk is an international charity which performs total joint arthroplasty (THA) in third-world countries where these life-saving operations are not available. It was founded in 1998 by Dr Larry Dow in Los Angeles and has expanded to form 15 separate chapters in North America. The first international chapter was formed by our senior author in 2016.

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P10 Primary THA
P10-574
HIGH IMPACT AND LORD SPORTS ACTIVITY AFTER TOTAL HIP ARTHROPLASTY
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Introduction/objectives: There is no consensus what kind of sports are preferred activity after receiving total hip arthroplasty. It’s generally accepted low impact sports just like walking and swimming and golfing. But increasing the number of total hip arthroplasty and the demands of good activity of daily living after surgery, some patients do high impact and high load sports.

Methods: 22patient (29joints) were evaluated retrospectively. Demographic data, Japanese Orthopaedic Association Score (JOA score), pre/post-operative range of motion and VAS for satisfaction in sports activity. Radiographic analysis was also recorded bone reaction and loosening.

Results: Mean follow up period were 2.41 years. Post-operative JOA score increased to 96 points (MAX 100 point). Average range of motion of Flexion, Extension, Abduction, Adduction, External rotation, internal rotation were 108.9, 6.09, 30.43, 34.53, 42.61, 31.3. Mean VAS increased to 8.7(MAX10 points). 9 patients returned to jogging, 3 patients returned to Classic ballet and Kendo. Other high impact sports were Rugby and football, snowboarding, aerobics and Karate.

Conclusion: The patients who returned to do high impacts sports keep good-range of motion and satisfaction for the activity. In this moment, there is no loosening and breakage of implants.

P10 Primary THA
P10-485
UP TO 10 YEARS FOLLOW-UP OF 870 THR WITH CERAMIC-ON-CERAMIC BEARING A RETROSPECTIVE SINGLE CENTRE STUDY
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Introduction/objectives: Nowadays, over 10 million people around the world were treated with a ceramic component. Ceramic on ceramic bearing was first introduced more than 40 years ago. Advantages of CoC bearings are no allergic reaction and low wear debris. The aim of this retrospective study was the clinical evaluation of ceramic on ceramic bearing, which was in use since 2005 at the Department of Orthopaedic Surgery, Medical University of Graz.

Methods: 798 patients, 379 men and 420 women, were included in this retrospective study. Within this collective, 870 ceramic on ceramic bearings in combination with a Corail® stem and Pinnacle® cup were implanted. In 63 % (n=722), a 36 mm head was used, in 11 % (n=82) a 32 mm head and a 28 mm head was used in 6 % (n=44). The mean postoperative radiologic follow-up of all patients together was 44 months (range, 3-126 months). The assessment of the radiographs included sign of stress shielding, osteolysis, heterotopic ossification, bone resorption-related in Gruen zones and the implant position.

Results: Erosions of stress shielding associated with the stem were found in 7 cases. Heterotopic ossification was observed in 46 patients and clinically relevant radiographic loosening lines in 120 cases. Revisions due to implanting and aseptic loosening had to be done in 7 cases. Due to Location in one case and early infection in one case. An Inlay fracture occurred in 3 cases. 48 patients died during the time of observation.

Conclusion: The results of our study showed excellent clinical results and minimal risk for aseptic loosening of the Corail® stem compared with international registry data, such as Australia, New Zealand, Denmark and England, where an implant survival for the Corail® stem was reported from 97% to 99% after a follow-up up to 10 years.
MID-TERM CLINICAL AND RADIOGRAPHIC OUTCOME OF ANTEROLATERAL HP SURFACE ARTHROPLASTY
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Case Study: Objectives. Hip surface arthroplasty is usually performed using a posterior approach, but some studies cautioned against the posterolateral capsule-releasing compromising the femoral head-neck blood supply. Only a few preliminary outcomes of resurfacing arthroplasty through alternative approaches have been reported. This study evaluates retrospectively the mid-term clinical and radiographic results of modern metal-on-metal hip resurfacing performed through an anterolateral Watson-Jones approach.

Methods. Fifty-seven hips in 52 patients underwent a Compass® Plus surface prosthesis because of degenerative arthritis. Two patients died of unrelated causes, leaving 55 hips in 50 males (3 bilateral) and 15 females (2 bilateral), with a mean age of 56 years (range, 27-70). Clinical and radiographic evaluation was available for all cases at an average follow-up of 3.2 years (range, 2-5).

Results: Two hip replacements in the same patient were successfully converted to conventional arthroplasty because of early aseptic loosening of the acetabular cup. The mean Harris hip score improved significantly from 58.3 (49.5 - 64.9) points preoperatively to 93.7 points at the latest follow-up. An average neck narrowing of 3.27%, never exceeding 10%, was measured. Progressive periprosthetic radiolucencies and osteolysis were not observed. The cumulative survival rate at 5.2 years (range, 2-9.2) was 95.8% (95% CI: 90.2 - 100) points. The dislocation rate was 12.5% (3/24) and the mean Harris hip score improved significantly from 59.8 points preoperatively to 95.7 (90.2 - 100) points at the time of latest follow-up. Of the 22 patients (22 hips) who had died, all had retained their hips and died from other causes.

Conclusion: Primary THA utilizing an anterolateral, flat, taper stem with a reduced distal profile had high implant survivorship at a minimum follow-up of 5 years and was associated with a significant improvement in a patient-reported outcome measure.
Sagittal plane that leads to error in anteversion.

Preoperative lateral setting and intraoperative motion error were found in lateral decubitus position especially in imageless computer navigation were 2.85° (SD, 2.08°) and 5.09° (SD, 3.04°) respectively.

Methods:

Frequent causes of malpositioning of the acetabular component were

deviated degree of cup position from desired position (40° inclination and 10° anteversion). Intraoperative motion error detected and corrected by fluoroscopy and computer navigation, respectively.

Results

After lateral decubitus setting, preoperative setting error was detected and corrected with fluoroscopy by surgical bed tilting.

Intraoperative motion error detected and corrected by fluoroscopy and computer navigation, respectively.

Conclusion:
The group of patients with similar demographic characteristics there were no differences in the early inflammatory response and decrease in hemoglobin values in relation to hybrid fixation, not cemented with standard stem.
P10 Primary THA

P10-128
SAME-DAY BILATERAL TOTAL HIP ARTHROPLASTY WITH THE DIRECT ANTERIOR AND THE POSTERIOR APPROACH: A COMPARISON OF OUTCOMES

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Introduction/objectives: To compare different characteristics as well as in-hospital charges between patients undergoing same-day bilateral total hip arthroplasty (SBTHA) with the direct anterior (DAA) or the posterior approach (PA).

Methods: We retrospectively reviewed clinical characteristics of patients treated with DAA or PA/SBTHA between 1/2010 and 12/2015. We documented demographics, comorbidities, length of stay (LOS), total/homogenic transition rates, in-hospital complications, discharge disposition, 90-day mortality and readmission rates, and hospital charges. Univariate analyses for differences among groups were conducted using Wilcoxon rank-sum test for continuous, and Chi-square or Fisher’s exact test for categorical variables. Significance level was set at 0.05.

Results: A total of 257 patients were included (115 men; 142 women; mean age 55.6±12.4 years). The DAA and the PA groups included 97 and 170 patients, respectively. The groups were similar in age (p=0.59), Day-Charlson comorbidity index (p=0.98), and female gender (p=0.56). Procedure (p=0.001) and OR times (p=0.001), as well as LOS (p<0.001) were lower in the DAA group. The DAA cohort was more likely to be discharged home (p=0.023). Ninety-day mortality and readmission for revision were both 0% for either group. No difference was found in local (p=1.0), minor systemic (p=0.67) and major systemic (p=1.0) complications. Blood transfusions of any type (p=0.55) and allogenic blood transfusion rates (p=0.97) were similar between groups. Total in-hospital charges were significantly lower for the DAA group (p=0.005).

Conclusion: The DAA is a safe alternative to the PA for SBTHA with respect to patients’ safety, as well as the hospital and surgeons’ burden.

P10 Primary THA

P10-450
RISK FACTORS FOR INCREASED SAGITTAL PELVIC ROTATION IN PATIENTS REQUIRING THR

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Introduction/objectives: The aim of this study was to investigate how gender, age and lumbar degenerative disease affect the number of patients at risk of excessive sagittal pelvic rotation.

Methods: Pre-operatively, 3428 patients had their pelvic tilt (PT) and lumbar lordotic angle (LLA) measured in three positions: supine, standing and flexed-seated, as part of routine planning for THR. The pelvic rotation from supine-to-standing and from supine-to- seated was determined from the difference in pelvic tilt measurements between positions. Lumbar flexion was determined as the difference between LLA standing and LLA when flexed-seated. Patients were stratified into groups based upon age, gender and lumbar flexion. The percentage of patients in each group with excessive pelvic rotation, defined by rotation >32° in a directional deviation, was determined.

Results: Posterior pelvic rotation from supine-to-stand increased with age and decreasing lumbar flexion. This was more pronounced in females. Similarly, anterior pelvic rotation from supine-to-flex seated increased with age and decreasing lumbar flexion. This was more pronounced in males. Notably, 30% of elderly females had excessive pelvic rotation. Furthermore, 36% of patients with lumbar flexion <20° had excessive pelvic rotation.

Conclusion: Excessive pelvic rotation was more common in older patients and in patients with limited lumbar flexion. This might be a reason for the increased dislocation rate in the elderly population. A more constrained bearing might be a more valuable option in patients with limited lumbar flexion (<20°), which constitutes 5% of the THR population. The large range of pelvic rotation in each group supports individual analysis on all patients undergoing THR.

P10 Primary THA

P10-317
COMPARATIVE ANALYSIS OF CEMENTED AND CEMENTLESS ARTHROPLASTY TECHNIQUES.

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Introduction/objectives: The question of using cemented or cementless techniques for total hip replacement (THR) is controversial at present. However, most countries refused cemented arthroplasty in favour of cementless. Objective is to perform a comparative analysis of the results of cemented and cementless THR according to revision arthroplasty of patients with aseptic loosening of components.

Methods: We conducted a retrospective controlled study included analysis of the 538 case histories with aseptic loosening of the components carried out from January 1, 2014 to December 31, 2017. In 1 group were included 302 cases after cementless THR. The 2 group included 234 cases of cemented THR.

Results: The average time from the primary THR to the revision in 1 group was 8.9 ± 1.2 years, in 2 group - 5.1 ± 1.5 years (p<0.05). The distribution of bone defects according to Paprosky: 1 type - 31 (10.2%), 2 group - 9 (3.0%); 2A type: 1 group - 79 (25.8%); 2B group - 36 (11.4%); 2B type: 1 group - 91 (30.1%), 2 group - 56 (20.6%); 2C type: 1 group - 47 (15.8%); 2 group - 62 (26.5%); 3A type: 1 group - 59 (19.9%); 2 group - 41 (17.5%); 3B type: 1 group - 11 (3.6%); 2 group - 28 (12%). Using of bone auto- and allografts, tantalum augments in 1 group were performed in 97 cases (32.1%), in 2 group - 131 cases (56%). Antiprotrusio cages in 1 group were used in 77 cases (25.5%), in 2 group - 99 (42.2%). Implantability of components implantation due to huge bone defects in 1 group was in 5 cases (7.7%), in 2 group - 9 cases (3.8%).

Conclusion: Reducing the time from primary THR to revision surgery, significant bone defects, necessity of more expensive metal components implantation during revision surgery in future allowed us to say about of limitation indications for cemented THR.

P10 Primary THA

P10-585
PREDICTORS OF PHYSICAL FUNCTIONING AFTER PRIMARY UNCEMENTED TOTAL HIP ARTHROPLASTY

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Introduction/objectives: While total hip arthroplasty (THA) is often successful, about 30% of patients report limitations in physical functioning two year after surgery. This study aims to define which baseline characteristics that have reported associations with functional outcome are important predictors of physical function in patients who underwent THA.

Methods: We first performed a systematic literature review to identify patient characteristics with known or suspected associations with physical function after THA. Then, we used backward linear regression to assess which of these pre- operative characteristics actually predicted physical function in our population of 150 patients who participated in a multicenter RCT. Physical function was quantified as Hip disability and Osteoarthritis Outcome Score Physical function Short form (HOOS-PF), scores at one year follow up. No difference in HOOS-PF scores across were observed between randomization groups (Zweimuller vs. CFP stem), so the prediction model was built for the complete study population.

Results: The systematic review resulted in strong evidence for BMI, age, comorbidity, mental health and pre-operative physical functioning as predictors for post-operative physical function. The strongest predictors in the RCT population were mental health (p=0.152), pulmonary comorbidity (p=0.001), and pre-operative physical functioning (p<0.001).

Conclusion: Based on both literature and a clinical prediction model, pulmonary comorbidity, pre-operative physical functioning and mental health were important predictors of physical functioning 1 year after a THA. These findings are valuable for managing patient expectations and improving functional outcome after THA.

P10 Primary THA

P10-327
ASSOCIATION OF LUMBAR DEGENERATIVE DISEASE WITH POSTERIOR SAGITTAL PELVIC ROTATION IN PATIENTS UNDERGOING TOTAL HIP ARTHROPLASTY

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Introduction/objectives: The aim of this study was to investigate whether lumbar degenerative disease affects the number of patients at risk of excessive sagittal pelvic rotation.

Methods: A systematic review was undertaken to identify associations between degenerative lumbar disease and sagittal pelvic rotation. We included all studies comparing patients who underwent total hip replacement with those who did not. The review was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Results: A total of 20 studies were included in the review. There was no significant association between lumbar degenerative disease and sagittal pelvic rotation. However, there was a trend towards a higher incidence of excessive sagittal pelvic rotation in patients with lumbar degenerative disease.

Conclusion: While the evidence is not conclusive, the findings suggest that lumbar degenerative disease may be a potential risk factor for excessive sagittal pelvic rotation in patients undergoing total hip replacement.
P10 Primary THA

P10-11
SEQUENTIAL BILATERAL TOTAL HIP ARTHROPLASTY THROUGH A MINIMALLY INVASIVE ANTERIOR APPROACH IS SAFE TO PERFORM

Introduction/objectives: Sequential bilateral total hip arthroplasty (THA) has the potential advantages of a single operative intervention with a single hospital stay, alongside reduced costs and total rehabilitation times. Its use has been limited, however, by a theoretical increase in perioperative complications.

The objective of this study was to assess functional outcomes and complications in patients undergoing sequential bilateral THA performed using an anterior minimally invasive surgery (AMIS).

Methods: Two surgical centres conducted a retrospective observational analysis of 130 patients (77 females) with a mean age of 57 ± 7 years, all of whom were operated by the same surgeon and followed up for 24 months.

Results: The mean length of hospital stay was 8.4 (range, 6-18) days. The mean operative time was 162 (range, 90-180) minutes, the mean intraoperative blood loss was 235 ml, and the mean preoperative and postoperative haematocrit levels were 43.8 ± 1.3 and 40.3 ± 1.2, respectively. No perioperative complications or deaths were recorded. The Harris Hip Score (HHS) improved from 44.5 ± 13.7 preoperatively to 98.9 ± 1.0 at final follow-up. The High Activity Osteoarthritis Outcomes Score (HOOS) improved from 58.2 ± 6.7 to 88.8 ± 5.2, while the health-related quality of life (EuroQol-5D) improved from 60.1 ± 6.0 to 71.0 ± 4.7.

Conclusion: This retrospective analysis suggests that, in selected patients, sequential bilateral THA via an anterior minimally invasive approach appears to be a valid alternative to two-stage bilateral THA.

P10-71
USE OF A DIGITAL PROTRACTOR AND A SPIRIT LEVEL TO DETERMINE THE INTRAOPERATIVE INTERRUPTION OF FEMORAL COMPONENT DURING HIP HEMI-ARTHROPLASTY: A PROSPECTIVE CLINICAL TRIAL

Introduction/objectives: Femoral stem anteversion during hip arthroplasty is generally estimated by eye intraoperatively and proven to be inaccurate. This study aimed to determine the accuracy of a novel technique of using a digital protractor and a spirit level for improving surgeons' estimation of stem anteversion.

Methods: A prospective non-randomized study was conducted among 93 patients with femoral neck fracture who underwent cemented hemi-arthroplasty via posterior or anteversion approach. In the control group (n=42), 5 experienced surgeons assessed stem anteversion related to the femoral condyle plane by their visualization at the target angle of 10-15°. In the study group (n=51), another 2 surgeons assessed by placing a digital protractor on the femoral condyl while the assistant held the leg in the truly vertical position, verified by a spirit level that was attached to the shin with cable ties. Stem anteversion was measured blind postoperatively on CT-scans and compared to intraoperative results. The data were compared between groups by using the exact probability test and t-test.

Results: The mean postoperative anteversion was 22.4° (4° to 54°, SD 11.1°) in the control group and 23.0° (16° to 30°, SD 3.6°) in the study group (p<0.05). The mean difference between the intraoperative assessment and CT results was -0.5° (5° to 7°, SD 3.5°, 95%CI -1 to 1) in the study group. The study group had more stems positioned in 15°-25° anteversion (71.0% vs 33.3%, p<0.001). Underestimation was found to be significantly lower in the study group (0% vs 29%, p=0.001), but not different for overestimation (29% vs 39%, p=0.491).

Conclusion: Using a digital protractor and a spirit level was reliable with high accuracy for improving the intraoperative estimation of femoral stem anteversion.

P11 Registries and outcome

P11-335
PREOPERATIVE PATIENT REPORTED OUTCOMES MAY PREDICT IN-HOSPITAL OUTCOMES FOLLOWING THA

Introduction/objectives: In this study, we evaluate the application of preoperative PRO scores, such as the Hip Dysfunctional and QoL Outcomes Score (HOOS) and EuroQol-5-Dimension (EQ-5D), as potential predictive modeling tools to anticipate adverse in-hospital outcomes.

Methods: Patients between the ages of 18 to 95 undergoing a primary THA between January 2015 and January 2017 at a single institution were chart reviewed for inclusion in this study. 40% of our patient population completed preoperative PRO tools.

Results: In total, 349 patients including 157 males and 192 females were recruited for this study. The average age and body mass index (BMI) was 62.4±11.0 years and 28.6±5.61 kg/m2, respectively. The median American Society of Anesthesiology (ASA) Score within our patient cohort was 2. Of the pre-operative scores, age, BMI, EQ-5D, and HOOS body mass index (BMI) was significantly correlated. However, these values were compared with average daily pain, all but age were significantly correlated. In this institution were chart reviewed for inclusion in this study. 40% of our patient population completed preoperative PRO tools and were included in this study. Nursing documentation was reviewed for patient demographics and in-hospital course metrics, such as visual analogue scale (VAS) for pain and morphine equivalence dosages within 1 year of surgery and were included in this study. In this study, we evaluated the application of preoperative PRO scores, such as the Hip Dysfunctional and QoL Outcomes Score (HOOS) and EuroQol-5-Dimension (EQ-5D), as potential predictive modeling tools to anticipate adverse in-hospital outcomes.

Conclusion: Our study demonstrates that baseline PRO scores, such as the HOOS and EQ-5D, contain a small predictive component for in-hospital pain scores and average daily morphine. Furthermore, PRO tools can potentially be used to develop systematic, predictive risk stratification models.

P11-237
INFLUENCE OF SURGICAL TECHNIQUE QUALITY ON MORTALITY, COMPLICATIONS AND FUNCTIONAL RESULT AFTER HIP FRACTURE IN 915 PATIENTS OLDER THAN 65 YEARS: POOR REDUCTION AS A RISK FACTOR FOR MORTALITY

Introduction/objectives: Influence of surgical quality (as evaluated in the post-surgical radiographic control) on mortality, complications and functional result in patients older than 65 years with a hip fracture.

Methods: Observational study of a single-center prospective consecutive cohort: 915 patients of 85±14 years, 736 (77.1%) females, from 2013 to 2015. 525 extracapsular (57.3%) were fixed with 510 trochanteric nails (AlfaBird) and 15 sliding hip screw-plate (Somet). Intraoperative fractures (39%), 42.9% were treated with cannulated screws (Smith-Nephew) (77) or arthroplasty (310 bipolar, 30 total, Futurig-3R). Surgical quality was analyzed post-op radiographs. Follow-up was 12 months. Binary analysis (Pearson, Fischer, Mann-Whitney, Wilcoxon) was applied to study statistically significant relations, and Relative Risk (RR) were calculated.

Results: According in 116 patients (12.7%) died: poor reduction was a significant risk factor in cannulated screw group (p=0.040) (RR 7.56, 1.55-36.78) and trochanteric nail group (p=0.003) (RR 2.069, 1.28-3.4), a not previously published risk factor. Complications included 22 wound infections (2.7%), 7 non-unions (0.8%), 8 cut-outs (1.6%), 5 broken nails (1.1%), 11 herniation/deep dislocations (3.7%), and 1 ischemic necrosis of femoral head (1.0%), the only significant risk factor was poor reduction for non-union in cannulated screws (p=0.016) (RR 22.87, 3.29-215). Previous walking ability was restored in 309 patients (38.7%) and worsened in 337 (42.2%), but statistical relations were not found, although follow-up data were inadequate in 153 cases (19.2%).

Conclusion: Appropriate reduction of hip fractures appears as a significant step to reduce mortality and non-union risk.
Introduction/objectives: To analyse the influence of International Normalized Ratio (INR) and haemoglobin (Hb) at admission on mortality and complications in patients older than 64 with a hip fracture.

Methods: Observational study of a single-center prospective consecutive cohort: 955 patients of 66±7.2 years, (72±7.5%) females, from 2013 to 2015. Fractures were extracapsular in 538 cases (56.3%) and intercapular in 417 (43.7%). Patients were controlled clinically and radiographically in out-patient clinic after 1, 3, 6, and 12 months. Statistical analysis: data were collected in a Microsoft Excel spreadsheet for the year following the fracture. Statistical analysis (Mann-Whitney, Student, Welch) was applied to study statistically significant relations, and Odds Ratio were calculated.

Results: On arrival at hospital, mean levels were Hb 12.7±1.7 g/dl and INR 1.26±0.8. A 13.8% of patients died (130) along the first year, 2.9% of them while in-hospital. Most frequent complications were respiratory infection (33.5%), urinary infection (11.4%), congestive heart failure (7.2%), sepsis (4.4%), prosthesiform dislocation (3.7%), wound infection (2.7%) and cut-out (1.6%). Higher INR is correlated to greater mortality (p<0.008), but lower Hb not. Lower Hb levels at admission are related to heart failure (p<0.005). Higher INR levels are significantly related to respiratory infection (p=0.004), urinary infection (p=0.008), congestive heart failure (p=0.005) and sepsis (p=0.001).

Conclusion: 1. A higher INR at admission is associated with greater mortality, sepsis, respiratory and urinary infections, and congestive heart failure in hip fracture patients. 2. Lower haemoglobin levels are related to congestive heart failure in these patients.

P11 Registries and outcome

P11-238

INFLUENCE OF ANEMIA AND BLOOD COAGULATION ON MORTALITY, MEDICAL AND SURGICAL COMPLICATIONS IN 915 PATIENTS OLDER THAN 65 YEARS WITH A HIP FRACTURE

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EFFECT OF ALCOHOL CONSUMPTION ON PATIENT REPORTED OUTCOMES IN HIP ARTHROSCOPY: A MATCHED-PAIR CONTROLLED STUDY WITH MINIMUM 2-YEAR FOLLOW-UP

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Introduction/objectives: The role of hip arthroscopy has increased; however, there is limited literature examining patient reported outcomes (PRO) in people who consume alcohol.

Methods: From February 2008 to July 2015, data were prospectively collected and retrospectively reviewed to identify patients that consume alcohol at the time of primary hip arthroscopy. Patients were matched 1:1 (heavy drinkers : non-drinkers) based on patient age ± 5 years, sex, BMI ± 5 kg/m2, acetabular Outerbridge grade (0, 1 vs. 2, 3, 4), and capsular tear (repair vs. release). All patients were assessed pre- and postoperatively with 4 patient-reported outcome measures: modified Harris Hip Score (mHHS), Non-Arthritic Hip Score (NAHS), Hip Outcome Score-Sport Specific Subscale (HOS-SSS), and International Hip Outcome Outcome Measure (iHOT-12). Pain was estimated on the visual analog scale. Satisfaction was measured on a scale from 0-10.

Results: 42 patients were included in the heavy drinking group and 42 patients were included in the control group. Both groups demonstrated significant improvement for all PROs collected and for VAS from preoperative baseline. At 2-year follow-up, the heavy drinking group reported diminished improvement in HOS-SSS scores (P = 0.0159) as well as smaller decrease in pain after surgery (P = 0.0157) compared to control. The heavy drinking group averaged lower post-operative scores on the iHOT-12 (P = 0.0032) and on mental components of the SF-12 (P = 0.0066) and VRS-12 (P = 0.0151) questionnaires. Significantly lower scores in the heavy drinking group reached PASS for this mHHS measure (P = 0.0029).

Conclusion: While hip arthroscopy may still yield clinical benefit in drinkers, patients who consume heavy amounts of alcohol may achieve an inferior functional status.

P11 Registries and outcome

P11-578

RELATIONSHIP BETWEEN FORGOTTEN JOINT SCORE-12 AND PATIENTS' OUTCOMES AFTER REVISION TOTAL JOINT ARTHROPLASTY

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Introduction/objectives: Patients evaluating tools assessing the outcome after revision total knee arthroplasty (rTKA) and revision total hip arthroplasty (rTHA) frequently focus on subjective ratings and often neglect patients' needs and views. However, patients' concerns after arthroplasty may differ significantly from the results of objective ratings. The aim of this study was to investigate the relations between Forgotten Joint Score-12 (FJS-12) and the other measurement parameters in patient with revision joint arthroplasty.

Methods: A total of 40 patients (rTKA 27, r THA 13) were included in the study with mean age 67±10.7 years. Patients performed patient-reported tests (FJS-12, Hospital for Special Surgery (HSS), Harris Hip Score (HHS)), 3 performance tests (50-Stop Walking Test, 10 Meter Walk Test, 30-Second Chair-Stand Test), and pain level evaluation (Numeric Pain Rating Scale (NPRS)) were preferred to assess patients.

Results: There were moderate significant correlation between FJS-12 and pain level (r=0.397, p=0.01) in all patients. While, strong significant correlation was found between FJS-12 and HHS (r=0.815, p=0.001) in rTHA patients, there were low, but not significant correlation between FJS-12 and HSS knee score (r=0.236, p=0.05) in rTKA patients. Also there were not significant correlation FJS-12 and all other performance tests (p>0.05) in all patients.

Conclusion: According to study results, with improvement in pain the patient can "forget his joint" by higher scores and this way patient may obtain good functional outcomes in daily life. Also the relation of FJS-12 to HHS suggests that FJS-12 as an instrument to evaluate outcome is proposed for rTHA patients.
Introduction/objectives: The WHO surgical safety checklist was introduced in 2009 to decrease mortality and mortality. However, the National Patient Safety Agency reported 56 orthopaedic-related adverse events between April and September 2017. Of these, 16 were non-revised hip or knee implants - details which are not included in the checklist currently. This study was performed in 2017 to reduce the number of adverse events in orthopaedic surgery, modifying the WHO checklist with 4 extra questions. We surmised that a small number of additional questions would improve safety in hip arthroplasty.

Methods: A Delphi study of 14 high-volume hip arthroplasty surgeons was undertaken asking them to rank the most important radiographic metrics on postoperative pelvic radiograph, which correlates with quality.

Results: The Delphi three up a number of elements that all agreed were key to a successful outcome. Leg length, combined offset, femoral component size, and acetabular inclination and anteversion and acetabular component size were deemed most important by all 14 surgeons, although the order varied. From these results, three topics were derived for the checklist:

1) Are there any diagnostic bone health or spinal issues to be considered?
2) Are there any issues regarding planned restoration of leg length and offset?
3) Has the size and make of the devices been selected, and the presence of alternatives confirmed should they be needed?

Conclusion: We think these questions should be added to make a hip arthroplasty checklist. We plan to trial it in our hospital, and carry out a prospective observational study, to see if more detailed planning translates to better results in patients. This checklist will be of particular importance to trainees to improve surgical outcome.

Introduction/objectives: Total hip arthroplasty (THA) is a successful operation for patients suffering from debilitating end-stage hip osteoarthritis. However, severe complications do still occur, and hip dislocation remains one of the most common reasons for revision surgery. The decision whether to continue with a non-operative regime or to perform salvage surgery depends on several factors which may cause the dislocations but also the patient's perspective. Since quality of life and subjective hip function is of major importance for the patient, we performed a systematic review on Patient Reported Outcome (PRO) after dislocation of primary THA compared to patients without dislocation with a primary diagnosis of osteoarthritis (OA).

Methods: We searched PubMed, Embase, Scopus, and Cochrane databases in September 2017 and identified 3460 unique studies. The review was registered in PROSPERO and conducted independently by 2 researchers and reported following PRISMA statement.

Results: 2 studies met the a priori inclusion criteria’s and they presented divergent results between patients with/without dislocation using a variety of well-known PRO measures (PROM). Extending the scope of the present review, we found no additional studies presenting PRO after a dislocation without comparison to non-dislocators exclusively in THA patients with OA.

Conclusion: This review has revealed that knowledge of patient reported quality of life and subjective hip function post-dislocation is merely non-existing. Although arthroplasty surgeons may possess empirical assumptions on the matter, there is a need for additional and larger scale studies to examine the subject in order to property inform THA patients with dislocation regarding what they can expect afterwards and when to recommend reoperation.
P11 Registries and outcome

P11-89

DEVELOPMENT AND VALIDATION OF THE BRABANT HIP FRACTURE SCORE FOR 30-DAY AND 1-YEAR MORTALITY

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Introduction/objectives: Hip fractures in the elderly are associated with advanced comorbidities and high mortality rates. Mortality prediction models can support clinicians in tailoring treatment for medical decision making in frail elderly patients. The objective of this study was to develop and internally validate the Brabant Hip Fracture Score for 30-day and 1-year mortality (BHFS-365) after hip fracture.

Methods: A cohort study was conducted in two hospitals in operatively treated patients of 65 years and older with a hip fracture. Manual backward multivariable logistic regression was used to select independent predictors of 30-day and 1-year mortality. Internal validation was performed using bootstrapping techniques. Model performance was assessed with: (i) discrimination via the area under the receiver operating characteristic curve (AUC); (ii) explained variance via linear regression analysis and sub-analysis using multivariable logistic regression were performed.

Results: Independent predictors of 30-day mortality were: age, gender, living in an institution, Hb, respiratory disease, diabetes and malignancy. In addition, cognitive frailty and renal insufficiency, were selected in the BHFS-365. Both models showed acceptable discrimination after internal validation (AUC=0.71 & 0.70). The Hosmer-Lemeshow test indicated no lack of fit (p=0.05).

Conclusion: We demonstrated that the internally validated and easy to use BHFS in surgically treated elderly patients after a hip fracture showed acceptable discrimination and adequate calibration. In clinical practice a cut-off of BHFS<30 <24 could identify frail elderly patients at high risk for early mortality and could support clinicians, patients and families in tailoring treatment for medical decision making.

P12 Revision THA

P12-96

STRUT ONLY ALLOGRAFT IN REVISION ARTHROPLASTY - OSSEOUS UNION AND CLINICAL OUTCOME

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Introduction/objectives: To investigate the outcome of the surgical technique 'Strut Only Allograft (SOA)' during revision hip arthroplasty. We assumed 1) high union rates between SOA and host bone, 2) little or no loss of correction / alignment and 3) good clinical outcome as determined by patient reported outcome measurements.

Methods: Patients who previously underwent revision hip arthroplasty at our department with concomitant SOA implantation were considered. Osseous union between the strut allograft and the host bone was verified by radiography in two planes according to the classification system of Emerson et al. The patient reported clinical outcome was assessed with the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Besides the limb-specific outcome the ambulatory status was assessed with the Parker-Mobility-Score (0=Worst, 9=Best). Medianers and interquartile-ranges were calculated as descriptive statistics.

Results: In our records, 43 patients were identified. Of those, 13 were deceased. 7 could not be contacted, 6 refused to participate. Consequently, 17 cases were available data collection (age 66, BMI 23.2). Regarding Osseous Union we found complete bridging of the SOA to the recipient bone in 74.5% of the cases. In 17.6%, the SOA showed partial bridging to the recipient bone. Only one case showed loss of correction / alignment. The WOMAC total was 22.27. The Parker Mobility Score was found 8±4.

Conclusion: On the basis of our findings it is concluded that the use of strut onlay bone allografts in advanced hip revision arthroplasty is a promising technique. The majority of SOAs is integrated to the recipient bone stock (bone augmentation) and provides additional mechanical stability.

P12-507

NONMODULAR STEMS ARE A VAILABLE ALTERNATIVE TO MODULAR STEMS IN REVISION TOTAL HIP ARTHROPLASTY

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Introduction/objectives: Nonmodular and modular femoral stems have been associated with complications following revision total hip arthroplasty (rTHA). This study aims to report outcomes of modular and nonmodular femoral components in rTHA.

Methods: From January 1st, 2013 to September 30th, 2017, all rTHA using modular or nonmodular femoral stems were identified. Demographic data including age, gender, American Anesthesiology Society (ASA) score, Surgical details including operative time, length of implant, and implant cost were collected. Clinical outcomes including length of stay (LOS), dislocation, infection, fracture, femoral implant re-revision, reoperation, and mortality were also collected. Simple linear regression analysis and sub-analysis using multivariable logistic regression were performed.

Results: Of 247 rTHA cases identified, 136 (55.1%) cases utilized modular stems while 111 (44.9%) cases utilized nonmodular components. The average follow-up was 15.5 months (range 0.5-59 months). Nonmodular stems had a significantly lower cost when compared to modular implants (44.3% of modular cost; p=0.001). There were no differences appreciated in cohort demographics including age (p=0.831), gender (p=0.495), and ASA (p=0.205). In addition, there were no differences observed in the surgical details or clinical outcomes assessed, including operative time (p=0.366), LOS (p=0.638), and rates of re-revision of the femoral implant (p=0.327), re-operation (p=0.410), and post-op complications including, infection (p=0.323), dislocation (p=0.687), fracture (p=0.526), and mortality (p=0.446).

Conclusion: The use of distal fixation, tapered-fluted, Hammill nonmodular components may offer a more cost-effective approach to rTHA compared to their modular counterparts.

P12-419

CLINICAL AND RADIOLOGICAL FOLLOW UP OF POROUS METAL ACETABULAR CUP IN REVISION TOTAL HIP ARTHROPLASTY

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Introduction/objectives: In hip revision surgery the main goals are, to attain a good primary stability of the implant and to restore the centre of rotation (COR) of the joint. The ostesysis that accompanies acetabular loosening undermines the stable fixation and correct position of the acetabular cup.

Objectives: Measure the functional outcome and acetabular loosening rates of patients who underwent acetabular revision surgery using porous metal components.

Methods: Case series study including all the patients operated by the senior author for acetabular revision surgery between November 2005 and July 2012. They were assessed using the Harris Hip Score (HHS), the Paprosky acetabular classification and the post-op position of the implants. We used digital x-rays and imaging software to calculate the final COR of the hip and the difference to the opposite side.

Results: We identified 40 patients, from those 35 were available to clinical evaluation and 37 to radiographical evaluation. The mean follow-up was 4.8 years. Age at the time of procedure was 65 ± 11 years. Seven cases were Paprosky 3A and two cases 3B. The mean HHS improved from a pre-op value of 26.02 ± 18.5 to 78.2 ± 13.9 in the post-op. The mean post-op acetabular cup angle was 49º ± 5º. The mean difference between the height of the COR in the operated and opposite side was 6.65 ± 11 mm in the post-op. During follow-up we observed migration of the COR greater than 4 mm in 3 hips.

Conclusion: In this series it was possible to accomplish a stable fixation of the cup, as shown by the minimal migration of the cups during the follow up, and the restoration of the COR to a more distal position in all of the hips. The good radiographic results are accompanied by an increase in the post-op HHS.
Introduction/objectives: Surgical correction of instability after total hip arthroplasty (THA) remains a complex challenge to the hip reconstructive surgeon. At our institution, we have developed a stepwise approach and surgical correction strategy for patients presenting with THA instability.

Methods: 37 patients presenting to a single surgeon for evaluation of THA instability underwent a standardized preoperative protocol to determine causative factors leading to instability. Radiographic images were reviewed for leg length, offset, cup inclination and anteversion, and dynamic changes in pelvic tilt from supine to standing, and standing to sitting. Findings were confirmed intraoperatively, and instability was addressed surgically through the stepwise algorithm.

Results: 37 consecutive patients have been prospectively reviewed for THA instability. Average pre-operative acetabular abduction was 47.8 degrees and anteversion was 12.4 degrees. Average pelvic incidence was 38 degrees. The acetabular component alone was revised in 22 patients, and the stem alone in 2 patients. Both acetabular and femoral components were revised in 4 patients. There were 9 cases where the head and liner were exchanged to a larger size. No isolated head or isolated liner exchanges were performed. Dual mobility heads were used in 20 patients (54%), with 46mm heads used in 11 patients and 36mm heads used in 6 patients. Post-operative acetabular abduction was 52.2 degrees (range 37–49) and post-operative anteversion was 27.3 degrees (range 22–34), p=0.003 for both.

Conclusion: Using this stepwise evaluation as a tool to guide surgical correction of instability, our study demonstrates a significant and promising decrease in the risk of recurrent instability in this high-risk population.

Introduction/objectives: Revision total hip arthroplasties (rTHA) are performed with increasing frequency due to the increasing numbers of primary arthroplasties, but very little is known regarding the influence of muscle strength impairments on functional limitations in this population. The aim of this study was to assess relationship between muscle strength and functional level in patient with rTHA at late stage.

Methods: Thirteen patients who had undergone rTHA mean 6.6±4.1 years ago were included in the study with mean age 63.6±12.1 years. Patients performed 4 performance tests (50-Step Walking Test, 10 Meter Walk Test, Iowa Level of Assistance Scale (ILAS), Iowa Ambulation Velocity Scale (IAVS)), and one self-report test (Harris Hip Score (HHS)) were preferred to assess patients. The maximum isometric strength of surgical limb hip flexor, extensor, and abduction muscle of all the patients was measured using Hand-Held Dynamometer (HHD).

Results: The high significant correlations were found between hip flexor, extensor muscle strength and ILAS (r=0.702, p=0.011), (r=0.741, p=0.032, respectively), and there were the high significant correlation between hip extensor muscle strength and the 10-meter walking time (r=0.735, p=0.038). There were not significant correlation between all other evaluating parameters (p>0.05).

Conclusion: The strong statistical significant correlation between hip extensor, flexor muscle strength and functional performance tests suggests that improved postoperative muscle strengthening could be important to enhance the potential benefits of rTHA.

Introduction/objectives: Relationship between muscle strength and functional level in patients with revision total hip arthroplasty is unknown. The purpose of the current study was to examine the relationship between muscle strength and functional level in patients with revision total hip arthroplasty.

Methods: In this cross-sectional study, 26 patients underwent revision total hip arthroplasty with a monolithic, tapered, fluted, grit-blasted, forged titanium stem. All patients were examined before discharge and at a mean follow-up of 6.0±1.3 months. Muscle strength was measured using a handheld dynamometer and functional level was assessed using the Harris Hip Score (HHS) and the Iowa Ambulation Velocity Scale (IAVS).

Results: The mean Harris Hip Score improved from 48.3±8.5 to 84.6±12.8 at final follow-up. The radiological analysis showed cup migration in 40 hips. The mean appearance time was 4.3 years (range, 1-25). Migration was progressive and painful in 27 hips (67.5%) requiring cup revision. Lateral mesh was more frequently associated with migrated cups. Cup tilting was found in all migrated cups. Survival with further cup revision for aseptic loosening was 78.3% (95% confidence interval: 68.7-87.8) at 17 years. In all surviving revisions trabecular incorporation was observed without radiolucent lines.

Conclusion: CUP MIGRATION AFTER ACETABULAR REVISION SURGERY WITH IMPACTION BONE GRAFTING AND A CEMENTED CUP IN LARGE BONE DEFECTS

Introduction/objectives: Impact biomechanics of hip grafting (iBG) is a reliable technique for acetabular revision surgery with large segmental defects. However, bone graft resorption and cup migration are some of the limitations of this technique. We assess frequency and outcome of these complications in a large acetabular iBG series.

Methods: We analysed 330 consecutive hips that received acetabular iBG and a cemented cup in revision surgery with large bone defects (Paprosky types 3A and 3B). Fresh-frozen femoral head allograft was modified manually. The mean follow-up after re-revision was 17 years (3-26). All data were prospectively collected. Kaplan-Meier survival analysis was performed. Changes in different parameters regarding cup position were assessed pre- and postoperatively and at the follow-up controls. Only variations greater than 2° and 3 mm were considered.

Results: The mean Harris Hip Score improved from 49.3±1.5 to 84.6±12.8 at final follow-up. The radiological analysis showed cup migration in 40 hips. The mean appearance time was 4.3 years (range, 1-25). Migration was progressive and painful in 27 hips (67.5%) requiring cup revision. Lateral mesh was more frequently associated with migrated cups. Cup tilting was found in all migrated cups. Survival with further cup revision for aseptic loosening was 78.3% (95% confidence interval: 68.7-87.8) at 17 years. In all surviving revisions trabecular incorporation was observed without radiolucent lines.

Conclusion: The strong significant correlation between hip extensor, flexor muscle strength and functional performance tests suggests that improved postoperative muscle strengthening could be important to enhance the potential benefits of rTHA.
P12 Revision THA
P12-292
MANAGEMENT OF TOTAL HIP ARTHROPLASTY DISLOCATION: A RETROSPECTIVE COHORT STUDY IN A TERTIARY REFERRAL CENTRE
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Introduction/objectives: Dislocation is a challenging complication after primary and revision of total hip arthroplasty (THA). We assessed the recurrence of dislocation after revision surgery in patients affected by THA dislocation, taking into account the number of previous surgeries and surgical revision procedure.

Methods: We included patients undergoing surgery for dislocation after primary or revision THA between 2008 and 2017. Collected data included demographics, previous surgeries, time from primary or revision THA and dislocation, mechanism of dislocation, abductor deficiency, orientation of cup and stem. Recurrence of dislocation after revision surgery was recorded.

Results: Ninety-four patients were included: 45 had dislocation after primary THA (G1) and 49 after revision surgery (G2). The most common cause of dislocation was inadequate placement of cup and/or stem (G1: 74.3%, G2: 86.7%). Recurrence rate of dislocation was significantly higher in the G2 (20.5% versus 5.7%; OR 3.6, 95%CI 2.8-4). Surgical revision was performed by the vascular surgeon. All cases had no intraoperative or postoperative complications. The acetabular constructs with lower recurrence of dislocation were constrained liner and dual mobility cup in the G1 (0%) and constrained liner and dual mobility cup in the G2 (13.3% and 16.7%).

Conclusion: Modular heads and cup revision were effective to reduce the risk of dislocation recurrence. Constrained liner and dual mobility cup prevented recurrence of dislocation in patients with instability after primary THA.

P12 Revision THA
P12-473
FACTORs AFFECTING SUBSIDENCE IN A MODULAR TAPERED STEM FOR REVISION TOTAL HIP ARTHROPLASTY
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Introduction/objectives: To report on subsidence rates using a single modular tapered femoral revision implant and determine radiographic risk factors for subsidence.

Methods: We reviewed radiographs from 41 hips who underwent revision total hip arthroplasty using the modular Strker Realisation hip system with a tapered stem. Patient data was obtained from theatre registers and a local database. A radiological review was carried out using the PACS and NIMIS imaging databases. Preoperative radiographs were scored according to the Paprosky system.

Results: 41 revision arthroplasties were carried out in the elective setting from 2009-2016 were included 21 male & 19 female (41 hips). Full data was available for 38. The mean age was 68(64-71). The Minimum follow up was 4(1)-6 years. The mean subsidence was 3.43mm (0.3 - 11.1mm). In our Cohort 3 were revised due to infection, 2 were revised due to femoral osteolysis and 1 was revised due to acetabular osteolysis. Two revisions were carried out in one year and were excluded. Post-operative bi-contactual contact of the proximal stem <20mm was associated with higher subsidence (P = 0.047). Total implant cage integration rates <80% were associated with higher subsidence (P = 0.007). Subsidence was significantly associated with a stem length >195mm (P=0.003) and use of Extended Trochanteric osteotomy (P=0.016).

Conclusion: The use of a modular tapered stem for revision femoral arthroplasty demonstrated 14% revision rates which is in keeping with previous literature. Our cohort demonstrated a positive and statistically significant association between immediate postoperative stem bi-contactual contact and long term subsidence rates.

P12 Revision THA
P12-490
REVISION HIP ARTHROPLASTY IN PAPROSKY TYPE III ACETABULAR DEFECTS
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Introduction/objectives: The acetabular defects Paprosky type III and particularly where the penetration intrapelvic occurs substantially after the anatomy of the hip. In many of these cases there is a mediatisation implants associated with its loosening it difficult to know the relationship with vascular structures and the risk injury to the time of revision surgery. We present our experience in eight cases of patients operated by total hip prosthetics with Paprosky type III defect and who underwent preoperative selective arteriography.

Methods: We present 7 patients, 5 women and 3 men with a mean age of 76 years who had a prosthetic loosening Paprosky type III and those who underwent preoperative selective arteriography. All patients were operated by sticking crushed cancellous allograft contribution (Shoff technica) along a Burch-Schneider ring and cemented cup.

Results: Preoperative arteriography showed an intimate contact between the acetabular component and artery iliac in 3 cases. In these cases, revision surgery was performed by the vascular surgeon. All cases had no intraoperative or postoperative complications. The average follow-up clinical evaluation was 15 points (Marcie D’Aubigné). Clinical evaluation teaches us a good graft incorporation without component loosening.

Conclusion: The use of arteriography in planning hip revision surgery in III acetabular defects is essential to prevent vascular lesions.
**Introduction/objectives:** The aim of this prospective study is to evaluate the short to medium-term clinical and radiographic outcomes of acetabular revision cups in Traubecular Titanium (Delta One TT, Delta Revision TT).

**Methods:** Between December 2008 and August 2015 we performed 96 cup revisions, 46 with the Revision cup and 50 with the One cup. The bone defect was classified according to Paprosky classification: type IIB and IIC were treated by Delta One TT, type IIA and IIB were treated with Delta TT Revision. According to Delta One series, the causes of revision were: aseptic loosening in 48 cases, periprosthetic acetabular fractures with cup mobilization in 11 cases, three prior infections, one case of metasisis and one case of previous implant removal with severe bone loss. Mean age was 73 years (range 24-92). Pelvic discontinuity or Paprosky III were treated with cages (36 cases). Metal meshes were used in 12 cases (11 of them in association with cages). Bone defects were managed with TM augments (3 cases) or bone impaction grafting technique (25 cases). Stem revision was performed in 12 cases. Fractures were fixed with plates and screws in 2 cases. One liner was cemented into the pre-existing cup due to integration.

**Results:** The average follow-up was 42 months (range 12-89). 11 patients were lost at last follow-up. 3 patients died. Preoperative WOMAC total score in aseptic loosening group was 71.47 (range 70-76). At last follow-up WOMAC total score in all evaluable patient score was 17.84 (range 0-65). Five patients underwent a revision surgery: 3 cases for cup loosening (one required a custom-made implant), one recurrent dislocation and one deep infection. All the other cups were radiographically stable at last follow-up. We had 7 dislocations. 3 of them required surgery.

**Conclusion:** Cemented acetabular cups supported by cages are an effective treatment for acetabular reconstruction, providing a good quality of life.

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**Introduction/objectives:** Aim of this study is to evaluate clinical and radiological outcomes of cemented acetabular reconstruction in massive bone defects or pelvic discontinuity.

**Methods:** Between September 2010 and March 2017, 38 cemented acetabular reconstructions were performed: twenty-four cases of aseptic cup loosening (Paprosky type IIC or III), four periprosthetic acetabular fractures with cup mobilization, five recurrent dislocations, three prior infections, one case of metasisis and one case of previous implant removal with severe bone loss. Mean age was 73 years (range 24-92). Pelvic discontinuity or Paprosky III were treated with cages (36 cases). Metal meshes were used in 12 cases (11 of them in association with cages). Bone defects were managed with TM augments (3 cases) or bone impaction grafting technique (25 cases). Stem revision was performed in 12 cases. Fractures were fixed with plates and screws in 2 cases. One liner was cemented into the pre-existing cup due to integration.

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**Conclusion:** Cemented acetabular cups supported by cages are an effective treatment for acetabular reconstruction, providing a good quality of life.
Outcomes: Cutting progressively deeper, thread by thread, until the whole outer surface is cut around the shell and the cup is accessed. Insert the blade in the slot past the first thread and start twisting clockwise while pushing the blade in, against the cup removal system is placed with the ball in the socket and the blade in one of the slots (one which is easier. The appropriate size blade is fitted onto the acetabular cup removal system (according to the size of the acetabular shell) was performed at 1, 2.5 years and every 5 years thereafter. Radiological assessment was performed before re-revision of the BASPC or in hips with a minimum follow up of 5 years. It included evaluation of osteolysis, migration and signs of loosening.

Results: The mean follow-up time was 7.4 (0.5-23.4) years. 65 patients died during the follow-up, (24 of them before the 5-year follow-up). 14 patients were lost to follow-up within the first 5 years. 10 BASPC were re-revised: 8 for infection, 2 for aseptic loosening and 2 due to mal-positioning of the cup. The cumulative risk for revision (CR) for the BASPC was 8.5% at 15 years (95% CI: 4.3, 14.8%), while the CRrr for death was 65.3%, (95% CI: 53.3, 74.9%). 96 patients had clinical follow-up data. The mean HHS was 79 (range, 21-96). 88% of the patients had none or mild pain, 12% reported moderate hip pain.

Conclusion: Our data suggests that the long-term survival of the BASPC in acetabular revision is excellent.
P12 Revision THA

P12-37

UNADDRESSED ARTERIAL INJURIES IN REVISION TOTAL HIP ARTHROPLASTY: MORTALITY OUTCOMES OF A LOW-PREVALENCE COMPLICATION

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Introduction/objectives: Perioperative major arterial haemorrhage after revision total hip arthroplasty (RTHA) is an odd but limb- and life-threatening complication. In this retrospective analysis, we sought to determine the prevalence of such injuries requiring selective catheter embolization or bypass after RTHA and to evaluate treatment's efficacy in terms of mortality.

Methods: Between 1995-2016, 2524 RTHAs were performed at a high-volume centre (1012 one-stage revisions, 1370 two-stage revisions and 123 revision arthroplasties). Throughout this period, nine patients presented with signs of persistently bleeding unaddressed during index surgery (9/2524: 0.35%), causing haemodynamic instability. All patients underwent angiographic exploration within the first six postoperative hours. Angiography evidenced 4 cases of bleeding pseudoaneurysms (3 of them related to the common femoral artery and 1 to the medial circumflex femoral artery) and 5 cases of direct lacerations (1 case in the inferior epigastric artery, 1 in the hypogastric artery, 1 in the external iliac artery, 1 in the popliteal artery and another in the superior gluteal artery).

Results: Six cases underwent selective percutaneous angiographic embolization with gelatine microspheres, obtaining immediate hemodynamic stabilization; whereas 3 cases required a further bypass surgery with synthetic graft. Of the former group, 4 patients had an uneventful evolution, while 2 died at a mean of 45 days after surgery due to multi-organ failure (MOF).

Conclusion: The overall risk of arterial injury associated with RTHA was low. However, recognition of such a complication is imperative since it was associated with a high mortality rate.

P13 Short stems

P13-379

ASSESSMENT OF IMPLANT FIXATION AND PATIENT-REPORTED OUTCOME OF THE NANOS SHORT HIP STEM - A PROSPECTIVE STUDY

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Introduction/objectives: The primary purpose of this study was to evaluate the implant fixation of the NANOS short stem by measuring the migration of the implant and to assess the change in quality of life. The secondary purpose of this study was to evaluate changes in clinical outcome.

Methods: 52 patients were included in this prospective study that were treated with the NANOS Neck Preserving Hip Stem (OHST Medizintechnik AG, distributed by Smith & Nephew GmbH, Marl, Germany) between 2011 and 2015 and followed up for 24 months. The study was approved by the ethics committee. Migration was determined by means of model-based radiostereometric analysis (RSA) in 17 patients. Quality of life was assessed by use of the Short-Form 36 Mental Component Score (MCS). Several clinical outcome scores (including the Harris Hip Score and the Hip Disability and Osteoarthritis Outcome Score) were assessed in addition.

Results: 48 patients (including 17 by means of RSA) could be followed up for 24 months. The mean total migration was 0.46±0.31 mm 2 years after surgery. The largest mean translational values (0.2±0.36 mm) were observed after three months along the y-axis in distal direction (−a-subdiaphysar). The migration pattern showed a secondary stabilisation of the stem after 3 months.

The mean MCS improved from 61.3 at baseline to 79.5 points at 24 months. All assessed clinical outcome measures improved significantly from baseline to 2 years (p<0.05).

Conclusion: Migration results indicate a good long-term outcome for the NANOS Neck Preserving Hip Stem. The clinical outcome scores showed excellent clinical results.

P13 Short stems

P13-446

GAIT ANALYSIS IN VARUS HIPS AFTER TOTAL HIP ARTHROPLASTY: A COMPARISON BETWEEN A SHORT AND CONVENTIONAL HIP STEM

de Waard, S. 1; Siervert, I. 2; Bach, N. 3; Hoormoen, D. 4; Kerkhoffs, G. M. 3; Haverkamp, D. 4

1. MC Sisternaat, AMC, Amsterdam, Netherlands; 2. Sisternaat Hospital, Spaarne Hospital, Amsterdam, Netherlands; 3. Sisternaat Center of Orthopedic Research and Education, MC Sisternaat, Amsterdam, Netherlands; 4. Sisternaat Ziekenhuis, Amsterdam, Netherlands; 5. AMC, Amsterdam, Netherlands; 6. Sisternaat Hospital and AVE Orthopädische Kliniken, Amsterdam, Netherlands

Introduction/objectives: Restoration of native offset seems to be an important predictor of success for the clinical outcomes of total hip arthroplasty. The offset has the most influence on the hip abduction moment. It is decreased more than 5mm if the stem is not able to fixate the hip abductors. This requires more strength from the abductor muscles, which generally contributes to a 9% loss of flexion. The aim of this study was to compare the migration of stems and the clinical outcome.

Methods: The primary aim of this study is to assess differences in peak hip abduction moment during gait after total hip arthroplasty between patients with the Optimix stem and the CBH stem (conventional stem) who are preoperatively classified as having varus hips.

Results: Patients are now included, we’re almost halfway. The data will be analysed between May and June, giving us enough time to draw conclusions.

Conclusion: Our hypothesis: short stems are better in restoring offset, therefore showing less limping during gait analysis in patients with varus hips.

P13 Short stems

P13-364

SHORT TERM SUCCESS OF PROXIMAL BONE STOCK PRESERVATION IN SHORT HIP STEM: A SYSTEMATIC REVIEW OF THE LITERATURE

de Waard, S. 1; van der Vliet, J. 2; Verena, P. 3; Siervert, I. 2; Kerkhoffs, G. M. 3; Haverkamp, D. 4

1. MC Sisternaat, AMC, Amsterdam, Netherlands; 2. MC Sisternaat, Amsterdam, Netherlands; 3. Sisternaat Hospital, Spaarne Hospital, Amsterdam, Netherlands; 4. AMC, Amsterdam, Netherlands; 5. Sisternaat Hospital and AVE Orthopädische Kliniken, Amsterdam, Netherlands

Introduction/objectives: Total hip arthroplasty is performed more frequently in younger patients nowadays, making long-term bone stock preservation an important topic. A mechanism for late implant failure is periprosthetic bone loss, caused by stress shielding around the hip stem due to different load distribution. Short stems are designed to keep the physical loading in the proximal part of the femur to reduce stress shielding. The aim of this review is to give more insight in how short and anatomic stems behave and if they succeed in preservation of proximal bone stock, compared to the recently published review of Knutsen et al on conventional stems.

Methods: A systematic literature search was performed to find all published studies on bone mineral density in short and anatomic hip stems. Results on peri-implant femoral bone mineral density, measured with DEXA, were compiled and analyzed per Grun zone in percentual change.

Results: A total of 26 studies were included. In short stems, Grun 1 showed bone loss of 8% after 1 year (n=776) and 5% after 2 years (n=179). Grun 7 showed bone loss of 9% after 1 year and 13% after 2 years. In anatomic stems, Grun 1 showed bone loss of 8% after 1 year (n=731) and 11% after 2 years (n=227). Grun 7 showed bone loss of 14% after 1 year and 15% after 2 years.

Conclusion: Short stems are capable of preserving proximal bone stock and have less proximal bone loss in the first years, compared to anatomic and uncemented conventional stems.
P13 Short stems

P13-187

ONE-STAGE BILATERAL TOTAL HIP ARTHROPLASTY: OUTCOME SHORT STEM VS. STRAIGHT STEM
Freundrich, J. (1); Maier, M. (1); Reinbacher, P. (1); Leithner, A. (1); Maurer-Endl, W. (1)

Methods: Between 2008 and 2019, 45 patients underwent bilateral THA, whereas 23 received a short stem and 22 a straight stem. All surgeries were performed by two experienced senior orthopaedic surgeons. Blood count was checked preoperatively and 3 days postoperatively. All data from operations were collected from the operative reports.

Results: Demographic data between the patient groups were similar regarding age, sex distribution and BMI (p=0.021, 0.887, 0.536). In comparison to straight stem THA, short stem THA showed shorter operation time (mean: 69 vs. 115 min, p=0.030), less blood loss (mean: 65% postoperatively), shorter hospital stay (mean: 8 vs. 9 days, p=0.118). There was a one revision for increased serum metal ions following MoM THA with a straight stem 57 months following implantation.

Conclusion: Although classical cementless implants have shown excellent functional outcomes, complications such as stress shielding, thin-pain and lucency lines are still often found. Short- stem implants have tried to overcome such complications by mimicking bone resection, preserving the femoral neck and facilitating a more physiological load pattern in the proximal femur. These advantages could reduce the rate of fracture in the long-term and could facilitate surgical revision in the future, especially in the younger population. In our series, SS prostheses had a 100% survival rate with just 3% showing minor complications.

P13 Short stems

P13-188

SHORT-STEM HIP ARTHROPLASTY: OUTCOMES WITH A MEAN FOLLOW-UP OF 43.5 MONTHS
Fontalva, M. L. (1); Bianco, D. (1); Castellanos, J. (1); Cuñé, J. (1); Tomers, E. (1); Esteve, A. (1)

Methods: A retrospective descriptive study that collected data from 39 SS hip arthroplasties (Taperloc Monoplate, Zimmer) between October 2010 and April 2015 with a mean follow-up of 43.5 months. The main indication for surgery was primary osteoarthritis. A posterior approach was used in all cases. Functional outcomes were assessed by preoperative and postoperative Harris Hip scores. X-rays were examined to identify signs of lucency or subsidence.

Results: Harris Hip score improved in all patients with a mean of 36 points by the last follow-up. X-rays depicted stem subsidence in two cases at the 1-year mark without progression in subsequent follow-ups. Two complications were reported: one intraoperative fracture managed conservatively and a dislocation resolved by closed reduction.

Conclusion: Even though classical cementless implants have shown excellent functional outcomes, complications such as stress shielding, thigh pain and lucency lines are still often found. Short-stem implants have tried to overcome such complications by mimicking bone resection, preserving the femoral neck and facilitating a more physiological load pattern in the proximal femur. These advantages could reduce the rate of fracture in the long-term and could facilitate surgical revision in the future, especially in the younger population. In our series, SS prostheses had a 100% survival rate with just 3% showing minor complications.

P13 Short stems

P13-288

OFFSET RECONSTRUCTION AFTER THA USING A NOVEL SHORT STEM SYSTEM
Mauersperger, W. (1); Freisemendich, J. (1); Maier, M. (1); Flachserauer, B. (1); Reinbacher, P. (1); Bratschitsch, G. (1); Leithner, A. (1)

Methods: A total of 100 stems were implanted in each device group. In the Corona group six patients were treated bilaterally. Preoperatively and postoperatively the measurement of the acetabular (AC), the femoral (FO) and the total offset (TO) was done using the MedCAD 2D software.

Results: In the Ana Nova group, the mean preoperative FO was 40 mm (SD 6.74 mm) and did not change postoperatively (mean 40 mm, SD 7.75 mm). The average TO was 78 mm preoperatively (SD 8.39 mm) and changed postoperatively to 77 mm (SD 7.49 mm). For the Optima short stem, the mean preoperative FO was 39 mm (SD 6.79 mm) and changed postoperatively to 49 mm (SD 7.49 mm). The average TO was 76 mm preoperatively (SD 6.48 mm) and changed postoperatively to 78 mm (SD 8.01 mm). The mean preoperative FO of the Corona stem was 36 mm (SD 7.63 mm) and changed to an average of 41 mm postoperatively (SD 3.8 mm). The TO was 76 mm preoperatively (SD 8.04 mm) and changed postoperatively to 77 mm (SD 6.29 mm).

Conclusion: Clinical and radiological examinations showed an excellent reconstruction of the femoral and the total offset with all stem types, especially with the Ana Nova Proxy System.

P13 Short stems

P13-289

EARLY EXPERIENCE WITH THE EVOLUTION FEMORAL STEM
Donaire-Hoyos, D. (1); Gonzalez Guiterrez, J. A. (1); Martinez-Espinosa, M. (1); Ruiz-Garcia, S. P. (1); Martinez-Martín, J. A. (1); Albert-William, A. (1)

Methods: In a period of 5 years 121 stems have been implanted in 116 patients, the average age of the patients is 60 in the right and in 5 patients they have a stem in both hips. The mean follow-up of the study is 31,1637 months.

Results: In the WORMAC Score before de operation is 59.07 and 3 months after de operation is 27.90. The mean for the Harris Hip Score before the operation is 44.80 and three months after the operation 75.81. As complications we had 2 infections, not appreciating any other complication to today’s date.

Conclusion: The early results of this stem is satisfactory and equivalent to those obtained with the primary Furlong stem in equivalent short-term studies.
**Conclusions**: The aim of this retrospective case-control study is to evaluate clinical and radiographic results of short stems compared with traditional hip prostheses.

**Methods**: 46 short stems (SS) and 50 traditional stems (TS) were selected. All the stems were implanted by the same surgeon by posterior approach because of primary osteoarthritis, post-traumatic osteoarthritis and avascular necrosis. All the patients were compared clinically (HHS, WOMAC, VAS, SF-12) and radiographically (offset, CD angle, limb length discrepancy, cup inclination, subsidence, osseointegration, heterotopic ossification). Radiographic evaluations were carried out by three different blinded surgeons. A statistical analysis was performed (Chi-squared, T-Test, Mann-Whitney).

**Results**: At a mean follow-up of 30 months all the implanted stems were well positioned and osseointegrated. In both the groups there has been a marked improvement in pain (p <0.001) with a statistically significant advantage in the SS group for WOMAC (37.1 ± 26.0; p <0.001; PS adjusted 0.008) and in part for HHS (36.2 ± 23.8; p <0.001; PS adjusted 0.002). The radiographic evaluations, with high concordance correlation between the three blinded surgeons (ICC consistently >0.85), showed no significant differences in the restoration of the articular geometry, with a reduction of cortical hypoplasia (2% SS vs 7% TS) and peri-prosthetic stress-shielding (p <0.05) in the SS group. On the other hand, SS were more related to limb length discrepancy (61% vs 33%; p <0.05). No major complication were recorded in the two groups.

**Conclusions**: Short stems showed to be comparable or better than traditional implants at short term follow-up.

**Introduction/objectives**: New short stems have been developed pursuing the goal of mini-invasiveness in primary total hip arthroplasty (THA). We aimed to compare the clinical and radiographic results of a new cementless short stem with a conventional one in patients undergoing primary THA at mid-term follow-up.

**Methods**: In 2010, 400 patients (M:F=215:185) (418 hips) underwent primary THA with GTS stem and 330 patients (M:F=117:212) (337 hips) with CLS stem; the average age was 57.4 (7-89) and 64.5 (25-95) respectively. The mean follow-up was 78 (64-88) and 77 (51-96) months for GTS and CLS. Harris Hip Score (HHS) questionnaire was administered preoperatively and at the last follow-up. Postoperative radiographic assessment was performed in all patients. Survival analysis was performed with Kaplan-Meier method.

**Results**: At the last follow-up, the mean HHS value did not differ significantly between the two groups (GTS: 96; CLS: 94; P=0.8). Thigh pain was found in 3 (1%) hips with GTS and 16 (5%) hips with CLS (P=0.001). The radiographic examination showed femoral cortical hypertrophy in 4 (1%) hips with GTS and 21 (6%) hips with CLS (P=0.001). Intraoperative calcar infractions occurred in 6 (1%) hips with GTS and in no case with CLS (P=0.05). At 5 years of follow-up, the cumulative survival rate for any cause of revision was 98.1% (IC95% 97.4-98.8) for GTS and 98.8% (IC95% 98.2-99.4) for CLS (P=0.44) for GTS, while for aseptic loosening was 99.5% (IC95% 99.2-99.8) for GTS and 99.7% (IC95% 99.7-99.9) for CLS (P=0.7).

**Conclusion**: GTS stem showed similar results of CLS stem in terms of functional and radiographic outcomes and mid-term survival in patients undergoing primary THA, with a lower risk of thigh pain and femoral cortical hypertrophy.

**Case Study**: Background: The use of a prosthetic cemented short stem in an elderly patient with a subcapital femoral fracture with not enough free space for a standard stem because of modular occupation has shown to be a feasible option instead of the removal of the implanted femoral hardware with good clinical results at short term evolution, and, furthermore, the implant overlapping can be helpful to avoid periprosthetic fractures.

**Methods**: Considering patient’s characteristics and physical demand, a partial arthroplasty was decided to implant. During operation, a subcapital fracture of her right hip in the context of an ipsilateral total knee arthroplasty and an intramedullary nail implanted in the femur after a supracondylar fracture three years before.

**Results**: The immediate postoperative evolution was satisfactory and uneventful, and the patient was permitted to bear weight the day after surgery. No major complications happened. One year after surgery the patient has only occasional mild blockages, no venous lesions or nerve injuries. But if there was a case of placement of the stem in varus which forced to perform a screw osteosynthesis in the tracing. There were no postoperative complications: there were no infections, no blockages, no venous lesions or nerve injuries. But if there was a case of placement of the stem in varus which forced to perform a screw osteosynthesis in the tracing. There were no postoperative complications: there were no infections, no blockages, no venous lesions or nerve injuries.

**Conclusion**: The use of an cementless short stem of a subcapital fracture in an elderly patient with a subcapital fracture of her right hip in the context of an ipsilateral total knee arthroplasty and an intramedullary nail implanted in the femur after a supracondylar fracture three years before.

**Case Study**: Aim: The purpose of this poster is to report the case and a solution for a 78-year-old female with a subcapital fracture of her right hip in the context of an ipsilateral total knee arthroplasty and an intramedullary nail implanted in the femur after a supracondylar fracture three years before.

**Methods**: Considering patient’s characteristics and physical demand, a partial arthroplasty was decided to implant. During preoperative planning it was observed that the available noncropped proximal femoral deformities was not long enough for a conventional prosthesis. Thus, an uncemented short stem (GTS Biomet) was chosen for cementation and a ceramic head.

**Results**: The immediate postoperative evolution was satisfactory and uneventful, and the patient was permitted to bear weight the day after surgery. No major complications happened. One year after surgery the patient has only occasional mild blockages, no venous lesions or nerve injuries. But if there was a case of placement of the stem in varus which forced to perform a screw osteosynthesis in the tracing. There were no postoperative complications: there were no infections, no blockages, no venous lesions or nerve injuries. But if there was a case of placement of the stem in varus which forced to perform a screw osteosynthesis in the tracing. There were no postoperative complications: there were no infections, no blockages, no venous lesions or nerve injuries.

**Conclusion**: The use of a prosthetic cemented short stem in an elderly patient with a subcapital femoral fracture with not enough free space for a standard stem because of modular occupation has shown to be a feasible option instead of the removal of the implanted femoral hardware with good clinical results at short term evolution, and, furthermore, the implant overlapping can be helpful to avoid periprosthetic fractures.

**Introduction/objectives**: Although different works have been published collecting the experiences of the use of conservative sheaths, we publish our preliminary experience in this type of offshoots, but there is no long term experience with these conservative offshoots. We present our experience over 5 years of the use of the conservative off GTS-Zimmer-Biomet sheath, and discuss some aspects of surgical techniques and preliminary clinical results.

**Methods**: Between November 2010 and March 2013, 131 patients received 137 primary THAs with GTS-Zimmer-Biomet prosthesis. The GTS-Zimmer-Biomet stem is made of forged titanium alloy. Thévenet sheath sizes were used, as well as standard compensation at 130 ° and lateralized offset at 152 ° for each side. The acellular component used was an Exceed ART Zimmer-Biomet semi-spherical cap with an E1 edge of 10 ° polyethylene, to increase the upper side cover and a ceramic head.

**Results**: During the operation there was only one intraoperative complication, a crack of the femoral calcar and it was said with a screw osteosynthesis in the tracing. There were no postoperative complications: there were no infections, no blockages, no venous lesions or nerve injuries. But if there was a case of placement of the stem in varus which forced to make the replacement a year of placement.

**Conclusion**: The result of the GTS Zimmer-Biomet stem after more than 5 years of follow-up has shown a good result.
P13 Short stems
P13-185
NONCEMENTED TOTAL HIP ARTHROPLASTY FOR OSTEONECROSIS OF THE FEMORAL HEAD IN YOUNG PATIENTS USING SHORT STEM
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Introduction/objectives: Total hip arthroplasty has become a common procedure with good long-term results. However, in young patients with osteonecrosis of the femoral head (ONFH), short-stem total hip arthroplasty (THA) could allow a potential advantage in preserving metaphyseal bone stock, when revision surgery might become necessary. The purpose of this retrospective study was to evaluate the clinical course of and the results of short-stem THA for ONFH in young patients using Mayo stem ( Zimmer, Warsaw, USA).

Methods: This study included 25 patients (29 hips) undergoing the total hip arthroplasty using the Mayo conservative hip between 2003 and 2008. All were able to follow-up for more than 60 months and at an age of less than 40 years with osteonecrosis of the femoral head. There were 8 females and 17 males. The mean age was 33.8 years old (range 24-39 years old), the mean follow up was 74.4 months (range 60-96 months). Japan Orthopaedic Association function of the hip joint score (JOA score) was recorded. Postoperative radiographs were evaluated for bone-implant fixation and osteolysis. Further analysis correlated clinical findings with this implants predefined characteristics.

Results: The clinical and functional results improved significantly (p < 0.001). At latest follow-up, mean JOA score was 95 points. 28 hips showed bone ingrowth fixation of the femoral components. One patient had revision surgery related to subsidence and leg length discrepancy. Dislocation occurred in two cases.

Conclusion: We conclude that the Mayo Stem stabilizes after 74.4 months and achieves good middle-term clinical results in most cases.

P13 Short stems
P13-101
BILATERAL THR WITH SHORT STEM IN A PATIENT WITH DIAMOND BLACKFAN ANAEMIA
Pérez, F. (1); Canals, C. (1); Varas, G. (1); Martinez Maluge, F. (1)
(1) Complejo Medico Policial Churruca-Visca, Buenos Aires, Argentina

Case Study: Diamond Blackfan Anemia is a congenital disease which is characterised by a medullary hypoplasia of the red series. Described in 1839 by Diamond and Blackfan, it generally appears in the first years of life as a severe anaemia, megaloerythroblastosis, reticuloenephalopia and a normal bone marrow cellularity, with absence of erythroblast precursors, which benefits from (1). The patient we present is a 24-year-old female with Diamond Blackfan Anemia at the age of 14, with diagnosis of bilateral NOA of the hip, who was treated with Bilateral Conservative THR with short stem, with a difference of 6 months between them, those who did not authorize the surgery simultaneously in one time because of the clinical characteristics described, performed a short monitoring for endocrinology and hematology. There is no specific bibliography on THR in patients with Diamond Blackfan Anemia, but we could include it in those patients who suffer the NOA after effects of the use of corticosteroids. A bilateral conservative THR with short stem was performed by means of postrotoral approach, using small components (caps N° 46 and short stems N° 6), with 24 months of follow-up. The patient is now without pain, is asympomatic and has complete mobility and excellent walk.

P13 Short stems
P13-102
THE USE OF THE SHORT STEM IN THR WITH SEVERE FEMORAL DEFORMITY.
Peirano, F. (1)*; Canals, C. (1)*; Varas, G. (1)*; Martinez Maluge, F. (1)*
(1) Complejo Medico Policial Churruca-Visca, Buenos Aires, Argentina

Case Study: The use of short stems in cementless THR is spreading fast. Its main objective is to preserve femoral bone stock by means of purely proximal fixation. We present a case of a woman where the choice of this type of implant was one of the few alternatives for total hip arthroplasty due to the enormous sagittal femoral deformity, as a result of various previous proximal, medial and distal femoral osteotomies done in her childhood for having bilateral DCH. The patient is a 62-year-old female with antecedent of Deformity, among others.

Methods: During 2001-2012, we placed 198 short stems in 107 men and 73 women (18 bilateral). The mean age was 52.2 years, (range 22-77) at the time of surgery. The most common preoperative diagnosis was osteoarthritis. Patients with deformities of the proximal femur or dysplasia with increased femoral anteversion were excluded.

Results: With a minimum of 5 years follow-up, an average of 94.1 months (7.84 years) was obtained with a range of 5-15 years. Thus, 183 were available for this study.

Conclusion: We present a 24-year-old female, 138 cm tall, who was diagnosed with Diamond Blackfan Anemia at the age of 14, with diagnosis of bilateral NOA of the hip, who was treated with Bilateral Conservative THR with short stem, with a difference of 6 months between them, those who did not authorize the surgery simultaneously in one time because of the clinical characteristics described, performed a short monitoring for endocrinology and hematology. There is no specific bibliography on THR in patients with Diamond Blackfan Anemia, but we could include it in those patients who suffer the NOA after effects of the use of corticosteroids. A bilateral conservative THR with short stem was performed by means of postrotoral approach, using small components (caps N° 46 and short stems N° 6), with 24 months of follow-up. The patient is now without pain, is asympomatic and has complete mobility and excellent walk.
**P13 Short stems**

**P13-91**
MEASUREMENT OF INITIAL BONE PRESERVATION OF PARTIAL COLLUM SHORT STEMS ACCORDING TO ITS ALIGNMENT IN RELATION TO STANDARD STEMS USING 3D MODELS
Burgos, F. (1); Portillo, M. (1); Mangielle, D. (1); Elhadi, D. (1); Martinez, F. (1)
(1) Austral University Hospital, Buenos Aires, Argentina

**Introduction/objectives:** The surgical technique of a specific partial collum short stem advocates the use of three point fixation. In practice, this position could be modified for a better reproduction of the anatomy.

**Objectives:**
- Estimate the initial bone preservation of partial collum short stems considering the most frequent alignments comparing with standard flat tapered wedge stem using a 3D model design.

**Methods:** 40 patients with THA using partial neck preservation short stem (Minhip®), Cronin, Cronodar, UK 1 year follow-up. Mean age was 47 years (25 - 60).
- x-rays of both hips were used to measure the stems inclination. 2 groups were classified. A = neutral +/- 10 grades (23); B = range > 10 grades (17).
- The CT images were segmented in DICOM format of the sectors.
- Modelling and reverse engineering of a standard flat tapered wedge stem (Accolade® (Stryker, USA) was performed. In the 3D models corresponding to the femur with the implanted short stem, we proceeded to the subtraction of it, and to the virtual implantation of the standard stems at the same femur. This, was guided by a blind operator expert in hip surgery.

**Results:** Average of preservation of the short / standard stems was 53.2 gr (17.3 - 104.3); 8.07 ml (2.2 - 15.8).
- Difference in groups A / B was, (weight): 29.8 g, CI 95% (29.1 - 30.5) P = 0.002. Group A, average: 5.9 cm3 (2.6 - 9.5).
- Group B: 6.9 g (18,57 -104,3). (volumen): 4.5 cm3 CI 95% (3.7-5.2) P = 0.002. Group A, average: 39.3 g (17.3 - 62.9).

**Conclusion:** Significant difference in bone preservation of short stems was observed compared with standard stems and was significantly higher in short stems aligned in varus. Considering the saving of bone, this information could be used for a more effective preoperative planning.

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**P13 Short stems**

**P13-423**
ONE TO 5 YEARS RESULTS OF A SHORT CEMENTED FEMORAL COMPONENT
Santoni, N. (1); Pozzato, D. (1); Bertino, A. (1); Santori, F. S. (1)
(1) Casa di Cura Città di Roma, Rome, Italy; (2)Rome American Hospital, Rome, Italy

**Introduction/objectives:** Short stem cementless total hip replacement has gained an increased interest in the last 15 years. In 2004 a shortened version of the cemented Friendly stem (Lima LT®) was developed. The shortened version of this polished stainless steel stem was studied to be implanted with a high neck cut and a fourth-generation cementing technique. The tip of the device extends only 2 cm below the lesser trochanter.

**Methods:** From Jan 2013 to Jan 2017 we performed 54 total hip replacement using the Friendly short stem. Mean age was 75 years (4 to 87). Mean follow-up is 2.7 years. Patients were evaluated pre and postoperatively with the HHS. On x-rays we observed and classified the quality of the cement mantle, stem alignment, subsidence, radiolucent lines, cortical hypertrophy and cortical resorption.

**Results:** 7 patients died for causes unrelated to THR 49 were available for follow-up. Harris improved from a mean of 46 to 83. One patient had a traumatic femoral fracture without stem mobilization 4 years after THR and was initially treated with ORIF but 1 year later required revision with a standard cemented stem. Of the remaining 41 implants, survival rate was 100%. In all cases we saw a Banks class A cement mantle and in 11 cases a physiologic stem subsidence less than 2 mm within the cement mantle. No bone-cement radiolucent lines, cortical hypertrophy and cortical resorption were detected.

**Conclusion:** Cemented femoral components remain the gold standard for THR in old patients with periprosthetic bone. In this small series of 54 THR, all at an average of 2.7 yrs. FU, we obtained excellent results with an ultra short cemented polished stem. Short stemmed cemented hip replacement is an interesting innovation with the great advantage of easing a possible future revision.
P14 Surgical approach
P14-577
THE LEARNING CURVE OF THE DIRECT ANTERIOR APPROACH WITHOUT TRACTION TABLE IN TOTAL HIP REPLACEMENT: USING THE LC-CUSUM METHOD

Methods: A retrospective collected database of 400 THRs using the DAA (January 2019- September 2016) at a single centre by a single surgeon. The learning curve was analyzed by determine duration of surgery, blood loss and number of complications.

Results: All 400 primary THRs were reviewed. Based on the LC-CUSUM, duration of surgery and surgical failure, the learning curve plateaued after the 19th surgery and the curve substantially follows a negative trend. The average duration of surgery changed significantly for the first hundred (78 minutes) to the last hundred (61 minutes), as well as a significant decrease in blood loss. A total of 17 (4.25%) complications occurred, with reduction of the complication rate as surgeons’ experience increases.

Conclusion: Our study did not show the steep learning curve as previously described in literature. The number of complications was small; and there was significant decrease in duration of surgery, blood loss and number of complications as surgeons’ experience increases. We suggest that the educational environment of a teaching hospital, combined with the use of the DAA is as standard approach for all primary THRs and supervision of experienced surgeons, contribute to the favourable learning curve with a low complication rate.

Introduction/objectives: The surgical approach for total hip replacement (THR) depends on surgeon preference or the preference and experience of the surgeon with a specific approach. The aim of this study was to analyze the learning curve of the Direct Anterior Approach (DAA) using the Cumulative Sum-Control Chart (LC-CUSUM).

DIRECT ANTERIOR TOTAL HIP ARTHROPLASTY. LEARNING CURVE

P14-418
DIRECT ANTERIOR TOTAL HIP ARTHROPLASTY. LEARNING CURVE

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Introduction/objectives: In recent years some surgeons have changed their preferences approaches to the direct anterior approach attracted by the theoretical advantages of this approach. Using a new surgical approach is a challenge for the orthopaedic surgeon who requires prior training in order to minimize complications related to learning curve. The purpose of our study was to analyze the results of the learning curve of the Direct Anterior Approach (DAA) to total hip replacement, as well as a significant decrease in blood loss. A total of 17 (4.25%) complications occurred, with reduction of the complication rate as surgeons’ experience increases.

Methods: This study is related to the first 200 total hip arthroplasty performed in the Vall d’Hebron Hospital, Barcelona. The surgeries were performed between 2014 and 2017. Radiological analysis was based in the position of the acetabular and femoral component. Clinical analysis was assessed by VAS scale, Harris Hip Score, the Oxford test. Besides surgical time, bleeding, time to hospital discharge and complications were reported.

Results: All patients presented significant clinical improvement at all scales. Radiological analysis shows 90% of acetabular cups were found placed in the safe area of Lewinnek. Fifteen percent of the femoral components showed more than 5 ° of anteversion.

Conclusion: The early rehabilitation and mobilization after hip arthroplasty (HA) in elderly femoral neck fracture (FNF) patients significantly reduces the post-operative morbidity and mortality. The approach without the muscle detachment has been proven to improve the early postoperative functional outcomes in non-arthrosis patients. However, there was limited literaturs on elderly FNF. This study aimed to report the hip muscle strength recovery after our anterior-based muscle-sparing approach (ABMS) in elderly FNF.

Methods: Forty elderly unilateral FNF patients who underwent HA with ABMS, was conducted. The primary outcomes were hip flexion and abduction power at each follow-up period. The contralateral muscle power, measured at three and six months, was used as the control value. The perioperative data and complications were recorded.

Results: 32 patients underwent bipolar hemiarthroplasty (BHA) while 8 other patients received total hip arthroplasty (THA). The hip abduction power was recovered to control value at 6 weeks (93±6.1%; 95%CI 86.8-101.2). No sciatic nerve injury was found. The intraoperative femoral fracture (IFF) was found in 7 patients (17.5%), and was significantly related to the early period of learning skill (first 11 cases; p<0.01). BHA had non-significant higher IFF than THA (8 versus 0; p=0.31). The hip muscle strength recovery after hip replacement using anterior-based muscle-sparing approach (ABMS) in elderly FNF.

Conclusion: After ABMS, the hip muscle could recover to the baseline value within three months. The IFF could be significantly improved with the learning skill, the adequate posterior soft tissue release, and gentle-mobilization of the hip joint. BHA might relate to higher risk of IFF due to difficult reduction from large femoral head diameter.

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13th Congress of the European Hip Society

P14 Surgical approach
P14-106
HIP MUSCLE POWER RECOVERY AFTER HIP REPLACEMENT USING ANTERIOR-BASED MUSCLE-SPARING APPROACH (ABMS) IN ELDERLY FEMORAL NECK FRACTURE: A PROSPECTIVE STUDY IN 40 PATIENTS

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(1) Chon Nonubodindra Medical Institute, Faculty of Medicine, Ramathibodi Hospital, Bangkok, Thailand; (2) Orthopedic department, Faculty of Medicine, Ramathibodi Hospital, Bangkok, Thailand

Introduction/objectives: The early rehabilitation and mobilization after hip arthroplasty (HA) in elderly femoral neck fracture (FNF) patients significantly reduces the post-operative morbidity and mortality. The approach without the muscle detachment has been proven to improve the early postoperative functional outcomes in non-arthrosis patients. However, there was limited literaturs on elderly FNF. This study aimed to report the hip muscle strength recovery after our anterior-based muscle-sparing approach (ABMS) in elderly FNF.

Methods: Forty elderly unilateral FNF patients who underwent HA with ABMS, was conducted. The primary outcomes were hip flexion and abduction power at each follow-up period. The contralateral muscle power, measured at three and six months, was used as the control value. The perioperative data and complications were recorded.

Results: 32 patients underwent bipolar hemiarthroplasty (BHA) while 8 other patients received total hip arthroplasty (THA). The hip abduction power was recovered to control value at 6 weeks (93±6.1%; 95%CI 86.8-101.2). No sciatic nerve injury was found. The intraoperative femoral fracture (IFF) was found in 7 patients (17.5%), and was significantly related to the early period of learning skill (first 11 cases; p<0.01). BHA had non-significant higher IFF than THA (8 versus 0; p=0.31). The hip muscle strength recovery after hip replacement using anterior-based muscle-sparing approach (ABMS) in elderly FNF.

Conclusion: After ABMS, the hip muscle could recover to the baseline value within three months. The IFF could be significantly improved with the learning skill, the adequate posterior soft tissue release, and gentle-mobilization of the hip joint. BHA might relate to higher risk of IFF due to difficult reduction from large femoral head diameter.

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ARTERIAL INTIMAL DAMAGE IN DIRECT ANTERIOR TOTAL HIP ARTHROPLASTY: REPORT OF FOUR CASES

Introduction/objectives: Arterial injury is rare during total hip arthroplasty (THA) and this may make the diagnosis and treatment extremely challenging. To our knowledge, there is no previous report of femoral arterial injury during THA via direct anterior approach.

Methods: A thousand primary THAs were performed by the orthopedic department of Imam Khomeini Hospital, Tehran University of Medical Sciences between 2013 and 2017. Four cases of vascular injuries during surgery were recognized. Demographics of the patients, type of injury, time to diagnosis, and management approaches were recorded.

Results: Four arterial injuries developed in 4 separate patients (3 female and 1 male patient). The time of recognition of injury was 0-10 hours after surgery. All injuries involved intimal damage, and all of them were managed by thrombectomy and bypass with venous interposition or onlay grafting by a vascular surgeon. One of the patients died because of developing disseminated intravascular coagulation (DIC) secondary to blood transfusion for massive bleeding. Two patients had diastolic hip and two patients had primary hip degenerative disease.

Conclusion: The incidence of vascular complications associated with THA via direct anterior approach was remarkably low in this series in a high-volume orthopedic service. The only type of injury in our cases was intimal damage of femoral artery. We believe that a sharp anterior Hohmann retractor which is routinely placed along the anterior acetabular rim, beneath the tendon of femoral rectus muscle may cause the injury. Therefore, we recommend using blunt retractors in this site. Furthermore, we recommend to check the distal arterial pulses immediately after surgery in order not to delay diagnosis and treatment.


HOW TO OVERCOME THE LEARNING CURVE IN DIRECT ANTERIOR APPROACH?

Introduction/objectives: Direct anterior approach (DAA) hip replacements have recently gained popularity and also appear to be associated with higher incidence of complications, especially during the learning curve period.

Methods: We reported the learning curve and complications of DAA using regular operative table in the first consecutive 100 hips of a single surgeon in adapting this approach to the institute. All procedures were performed with the use of fluoroscopic guidance on supine position. Prospective data was collected following a published protocol. In preparation for the use of DAA, the surgeon had 2-years DAA fellowship training and mentoring by surgeons who had experience with this technique.

Results: At 6-week follow up, the mean HHS and WOMAC were significantly improved when compared with the pre-operative period. Ninety-eight percent of acetabular components were in the Lewinnek zone. The mean blood loss was 250 cc (range: 150-900 cc). The mean operative time was 100 min (range: 85-110 min). There was no homolateral steam subsidence or loosening in our series. There was no leg length discrepancy more than 1 cm in our series. The time of surgery and blood loss had been significantly decreased with the increase of surgeon experience. There was no complication required additional surgery. There was no hip dislocation however, we observed two intra-operative complications including one scarar fracture and one tip of trochanter fracture. One patient had a superficial wound delayed healing with a bikini incision.

Conclusion: DAA had some distinctive complications during its vertical learning curve for the beginners. However, in our present study showed that incidence of major complications could be controlled with an increasing surgeon's experience and training.

Reference: (1) Panichkul, P.∗; Kazemi, M.∗; Hongvilai, S.∗; Vastupol, B.∗; Riping, S.∗; Samranvedhya, W.∗; Casa di Cura Città di Roma, Rome, Italy

ANTERIOR MINIMALLY INVASIVE APPROACH (AMIS) VERSUS LATERAL APPROACH: COMPARISON OF MAJOR INTRAOPERATIVE COMPLICATIONS DURING IMPLANTATION OF PRIMARY TOTAL HIP ARTHROPLASTY, A 10 YEARS RETROSPECTIVE STUDY

Introduction/objectives: We checked major intraoperative complications during implantation of primary total hip arthroplasty (THA) in a 10 years period in our hospital. We compared anterior minimally invasive surgery approach (AMIS) versus lateral approach.

Objectives: Two orthopedic surgeons performed 1023 primary total hip arthroplasty during period 2007 until 2017. There were 203 operations done by AMIS technique. Is there any difference of prevalence of major intraoperative complications between two surgical approaches?

Methods: We analyzed retrospectively data of all 1023 patients for major intraoperative complications.

Results: We had 17 major complications, using lateral approach, 6 of them happened during removal of osteosynthetic material when performing total hip arthroplasty after healed peritrochanteric fracture. The prevalence of major intraoperative complications using lateral approach during 10 years period was 2.05%. It had 4 major intraoperative complications using AMIS approach during 10 years period. In the first 2 years we had 1 periosteal detachment of femur and 2 protrusions of acetabular cup. After completed learning curve of the first 59 patients, we had only 1 abrasion of trochanter. The prevalence of major intraoperative complications using AMIS approach during 10 years period was 1.8%.

Conclusion: We didn't found significant difference of prevalence of major intraoperative complications between AMIS approach and lateral approach. After completing AMIS learning curve in the first two years, the prevalence using anterior minimally invasive approach dropped to 0.72%. AMIS approach is safer approach when the surgeon has gained enough experience during learning curve.

Reference: (1) Panichkul, P.∗; Kazemi, M.∗; Hongvilai, S.∗; Rojviroj, S.∗; Samranvedhya, W.∗; Casa di Cura Città di Roma, Rome, Italy
Conclusions: The direct anterior approach permits an early mobilization of the hip and a progressive load from the first post-op day and provides a good vision of the acetabulum and the femur during the operation. A long-term study will be needed to confirm the encouraging results obtained so far. The use of the minimally invasive T.S.P.S. approach has shown good short-term clinical and radiographic results.

Methods: The prospective, non-interventional observational study investigated 50 consecutive patients with MIS anterolateral approach (MAL) in lateral position, 25 consecutive patients with standard anterolateral approach (SAL) in supine position and 25 consecutive patients with mini-posterior approach (MPL) in lateral position. These very experienced high-volume surgeons, each with recognized reputation performed their favourite approach only. Preoperative and postoperative procedures including rehabilitation were for all patients in all details the same. Data registration (Harris-Hip-Score, abductor muscle power (MiniFES, CompuFES), proprioception (Footformed Raiser)) for all patients happened one day before surgery, 8 days after surgery and 3 weeks after surgery. For statistical evaluations the "Multivariate Regression Analysis" ("Ordinary-Least Squares", data 6 software) and "Difference-in-Difference" Method were used.

Results: MAL was superior to SAL and MPL in all benchmarks postoperatively. The differences in Harris-Hip-Score and proprioception decreased very little from first to second postoperative data registration whereas the differences in muscle power still increased.

Conclusion: To save the muscle integrity by use of MIS anterolateral approach in total hip arthroplasty leads to improved early outcome for patients concerning Harris-Hip-Score, abductor muscle power and proprioception.

Introduction/Objectives: The aim of the study was to compare the MIS anterolateral approach (Rottinger) in lateral position with the standard anterolateral approach in supine position (Bauer) and the mini-posterior approach with regards on early outcome after surgery concerning Harris hip score, abductor muscle power and proprioception.

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Introduction/objectives: The direct anterior approach (DAA) remains controversial as a technique for total hip replacement (THR). This method may be associated with a faster recovery, reduced pain and fewer surgical complications however, it has been recognised as having a steep learning curve. Some studies have suggested a higher complication rate especially with femoral fracture and lateral cutaneous nerve injury during the first 50 cases performed. The purpose of this study is to evaluate the experience of a single surgeon in using this approach using a regular operating table.

Methods: The first 70 TRAs performed over 5 years were reviewed. Currentness forms were used in all cases. No specific traction table was used. There were 9 males and 50 females, with a mean age of 44 years (range 22-82). Preoperative outcomes such as complications, revisions, length of operation and stay, blood transfusions and pain score were documented. Radiographic data and Patient Reported Outcome Measures (PROMs) were being evaluated.

Results: The main 1 dislocation and 1 femoral nerve injury (temporary). Other complications included 3 cases of leg length discrepancy and 5 patients with short term anterior hip pain. No revisions were performed. There was a decline in length of stay with experience (r=-0.296, p=0.014) however, there was no correlation with operative time (r=-0.091, p=0.518). The pain scores and transfusion rates were both low in all cases.

Conclusion: This data demonstrates that direct anterior approach using a regular operating table is safe during the learning curve in the setting.
P15 The paediatric hip

P15-588
THE MODELLING RESECTION OF THE FEMORAL HEAD IN CHILDREN.
Korol’sky, O. (1); Kuzya, Z. (1); Lizaveta, K. (1); Badynou, A. A. (1)
(1) Synergos Institute of Spine and Joint Pathology, Kharkiv, Ukraine; (2) Lviv Regional Pediatric Clinic Hospital, Lviv, Ukraine

Introduction/objectives: Hip pathology in children (avascular necrosis of the femoral head, pathological and congenital hip dislocation, posttraumatic deformations of the proximal femur) often lead to femoral head deformations. In these cases, modelling resection of the femoral head can be performed. Aim: to show the results of the using of the resection of the femoral head in children.

Methods: 44 patients (26 girls and 18 boys), aged 10 to 18 years. The long-term results of the resection of the femoral head were followed up from 5 to 20 years (the average term of 6.4 years) and evaluated basing on clinical, biomechanical and radiographic criteria.

Results: The method of resection of the femoral head: 1-st stage: soft-tissue decompression of hip joint; 2nd - anterior or lateral access to the hip, with greater trochanter osteotomy; 3rd - modelling resection of the femoral head; 4th - if indicated, intertrochanteric corrective osteotomy of the femur was performed. In the postop, lower limbs discharge was carried out for 1-5.2 months with the following CPM-therapy movements.

Results: The results of the treatment in long-term were the following: good in 31.8% (14 patients), satisfactory in 40.9% (18 patients) unsatisfactory in 27.3% (12 patients).

Conclusions: Indications for modelling resection of the femoral head are: significant bone-cartilaginous growths in the area of the femoral head and its saddle-shaped deformation, impeding the femoral head reduction. Unsatisfactory results were substantially due to the initial condition of the hip, while performing the modelling resection of the femoral head and particularities of the main disease.

P15 The paediatric hip

P15-358
NEONATAL PARAPLEGIAS. ORTHOPAEDIC AND FUNCTIONAL HIP ASPECTS: WHAT DO WE HAVE TO DON’T A CASE REPORT.
Martínez Espinosa, M. (1); Ruiz García, S. (1); González Gutierrez, J. A. (1); Paladino, D. (1); Donaire Hoyas, D. (1); Alberti-Ulba, A. (1); Martínez-Martin, A. J. (1)
(1) Hospital de Poniente, Orthopaedic and Traumatology Department, El Ejido, Spain; (2) Hospital Prof. Juan P. Garrahan, Buenos Aires, Argentina; (3) Hospital de Poniente, Hipt Unit, El Ejido, Spain.

Case Study: Introduction: Paraplegia consists of motor weakness that affects the lower extremities, it produce a loss of functionality, part of them are caused by ischemic factors.

Methods: A 3-year-old female patient was treated at the Garrahan Hospital of Pediatrics, with a diagnosis of ischemic neonatal paraplegia and a dislocation of the left hip by an open reduction, shortening and evaluation 9 years later, it evolves to a hip rigidly and a periprosthetic fracture. At 13 years old, our patient, was operated due to column problems making an arthrodesis from T3 to iliac. At this time the physical examination showed an attitude of flexion abduction of the left thigh by cusa vara, 5 years later, she presented a reduction of functionality, deformity in both hips, abduction and flexion the left one, attitude in flexion abduction the other one. Surgical treatment was a rotating osteotomy of the left femur and fixation with LCP plate, and for the right hip, a varus osteotomy.

Results: 5 years later, the patient is 23 years old, and presents dislocation of the left hip, a limitation to the hip flexion at 90 degrees and impossibility to sit down. As a final alternative, it was decided to perform a Girdlestone, in order to achieve at least 30° flexion.

Conclusions: In these patients, hip dislocations should not be reduced, because there would be re-dislocated. The therapy to be used initially is aimed at reducing deformities with adequate physiotherapy planning and control, progressive casts and alignment surgeries, but it is also necessary to know that they can improve in the first year of life. That’s why we do do not recommend hip surgery until neurological stabilization. Our conduct must be aimed at achieving a better and faster functionality.

P16 Trauma

P16-38
MINI INVASIVE APPROACH OR OPEN TECHNIQUE WITH POLYAXIAL LOCKING PLATES IN THE TREATMENT OF PERIPROSTHETIC HIP FRACTURES: WHICH PROCEDURE IS BETTER?
Almeida, E. (1); Sanchez Soler, J. F. (1); Martinez Diaz, S. (1); Loth, A. (1); Taü, M. (1); Manrique, F. (1)
(1) Hospital del Mar, Hospital de la Esperanza, Barcelona, Spain.

Introduction/objectives: Locking plates for the treatment of periprosthetic hip fractures (PHF) make minimally invasive approaches possible owing to the greater number of useful screws due to its polyaxial arrangement. Thus, there is less tissue damage and greater preservation of bone vascularization.

Methods: It is a prospective cohort study that includes all patients who underwent surgery for PHF without stem loosening using the NCB plate (Zimmer) with a mini-invasive (MI) approach in comparison to patients operated on with the classic open approach.

Conclusions: The purpose here is to evaluate the clinical and functional outcomes of patients who have undergone surgery for PHF without stem loosening using the NCB plate (Zimmer) with a mini-invasive (MI) approach in comparison to patients operated on with the classic open approach.

Results: Of a total of 22 patients, 9 were operated on with the MI approach and 13 with open surgery. The mean follow-up was 32.5 months (12-56 months). The outcomes in terms of the mean surgical time (p=0.04), the number of transfusions received (p=0.05) and functionality (p=0.05) were significantly better in the MI group. No differences were found in relation to bone healing time.

Conclusions: Patients that undergo PHF without stem loosening with the NCB plate using the MI approach have better clinical and functional results and lower morbidity than patients who are operated on using an open approach.

P16-39
PERIPROSTHETIC HIP FRACTURES: WHICH PROCEDURE IS BETTER?
Almeida, E. (1); Sanchez Soler, J. F. (1); Martinez Diaz, S. (1); Loth, A. (1); Taü, M. (1); Manrique, F. (1)
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(1) Hospital del Mar, Hospital de la Esperanza, Barcelona, Spain.
P16 Trauma

INCIDENCE OF PERIPROSTHETIC FRACTURES AFTER CEMENTLESS ALLOCCLASSIC ZWEYMUeller HIP HEMARTHROPLASTY
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Introduction/objectives: Previous studies reporting on the outcome of hemiarthroplasty using the cementless Alloclassic Zweymüller stem have reported excessive numbers of periprosthetic fractures. This is in contrast to what is experienced by most surgeons familiar with this type of prosthesis. The aim of this study was to establish mid-term periprosthetic fracture rates after cementless Alloclassic Zweymüller hemiarthroplasty.

Methods: In this retrospective review, the medical records of a consecutive series of patients who underwent hemiarthroplasty with the uncemented Alloclassic Zweymüller stem prosthesis (Zimmer GmbH) between July 2012 and December 2015 for intracapsular femoral neck fractures were reviewed. Patients who received hip hemiarthroplasty after a pathologic fracture or failed osteosynthesis of a non-displaced femoral neck fracture were excluded.

Results: The medical records of 520 patients (565 procedures) who underwent cementless Alloclassic Zweymüller Hip hemiarthroplasty for the diagnosis of an intracapsular femoral neck fracture were reviewed after a median follow-up duration of 3.3 years (IQR 2.3-4.0). Intra-operative fractures occurred in 14 patients (2.6%). Post-operative periprosthetic fractures occurred in 17 patients (3.2%) after a median interval of 5.3 weeks (IQR 1.9-30.4). Overall, 14 patients (2.6%) underwent reoperation as a result of periprosthetic fractures.

Conclusion: Use of the Alloclassic Zweymüller stem for hemiarthroplasty resulted in decreased rates of periprosthetic fractures compared to periprosthetic fracture rates observed in previous studies. However, additional prospective randomized studies are required to compare the safety of the cementless Alloclassic Zweymüller stem with cemented stems for hemiarthroplasty.

P16 Trauma

OUTCOMES OF MANAGEMENT OF PERIPROSTHETIC FRACTURES AROUND STABLE HIP OR KNEE IMPLANTS: WITH TOTAL FEMORAL PLATING
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Introduction/objectives: Periprosthetic fractures around or distal to hip or knee replacements represent a complex injury. Evidence supports open-reduction-internal-fixation however non-union, infection and further fracture remain a concern. We present our outcomes following total femoral plating for these fractures.

Methods: A retrospective study of 17 consecutive patients treated between May 2014 and December 2017 with total femoral plating (TFP) for fracture around THR or TKR was performed. TFP was defined as open-reduction-internal-fixation of a femoral fracture around stable implants in this challenging patient group.

Conclusion: At follow-up 58% demonstrated radiographic union at 3 months, 76% at 6 months. Four had symptomatic non-union, 3 scores were >4 for all modalities, Visual Analogue Scale (VAS) was 64.4/100. Follow-up was 24 months.

P16 Trauma

TREATMENT OF PERIPROSTHETIC FRACTURES VANCOUVER TYPE B2 THROUGH THE DAA INTERVAL
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Introduction/objectives: In the last two decades, the direct anterior approach (DAA) has become a standard approach for primary total hip arthroplasty (THA). The postulated advantages of the DAA are better functional recovery, easier discharge from hospital and potentially higher quality of life. In addition, the total number of revision surgeries in THA is steadily increasing. The increasing number of DAA approaches in the last years, has also raised questions regarding possible resource through the same interval. The aim of this study was to retrospectively determine the clinical and radiological outcome in patients with a periprosthetic fracture treated with stem revision through the DAA interval.

Methods: 41 patients were included in the current study. All of them had a periprosthetic fracture classified as Vancouver B2 with a loosen stem. The median age of the patients (male: 21; female: 20) at the time of the periprosthetic fracture was 70.5 years. All patients had a traumatic fall and the average time between index and revision surgery was 8 years.

Results: In all 41 patients, the revision and fixation of the fracture was performed through the DAA or the extended DAA interval. All patients had a clinical and radiological follow up for at least one year after the revision surgery. All patients had a very good stem alignment and none of the patients sustained a meta-plastic fracture. In eight patients the cup was revised in the same procedure to avoid dislocation after the revision surgery and in seven patients a cemented stem was used.

Conclusion: Our study shows, that the DAA and the extended DAA interval is a promising, reliable and safe procedure for revision surgery in THA in case of periprosthetic fractures with a loosen stem.
Case Study: An 80-year-old female patient who had an anterior dislocation of the hip with ipsilateral intertrochanteric fracture of the femur. Recurrence of anterior dislocation is extremely rare. We report a case of recurrent anterior hip dislocation in a patient with an ipsilateral intertrochanteric fracture of the femur. Most of these cases are anterior dislocations. Recurrence of anterior dislocation is extremely rare. We report a case of recurrent anterior hip dislocation in this patient.

Methods: Forty seven periprosthetic femoral fractures operated-on during the period 2004-2016 were followed-up retrospectively. There were 35 women and 12 men with mean age at the time of surgery 65.4 years (52-88 years). The mean follow-up for the group was 4.5 years (range, 1-13 years). Periprosthetic fractures were classified according to the Vancouver classification we obtained satisfactory outcome.

Results: There were a total 3 cases of postoperative complications in group I and 4 cases in group II. Conclusion: We retrospectively reviewed 125 cases of AO/OTA A2.2 fracture, treated with either CHS (group I, 34 cases) or PFN (group II, 91 cases). We evaluated the mean operation time, estimated blood loss and transfusion, hospital stay, sliding length of lag screw, tip-apex distance, change of neck shaft angle, mean union time, weight bearing time, mechanical failure, and ambulation ability by the Parker and Palmer mobility scores. Results: Operative time, estimated blood loss, transfusion, hospital stay, tip-apex distance, change of neck shaft angle, and Parker and Palmer mobility scores were not significantly different between the two groups (p>0.05). However, the mean sliding length of lag screw was 8.13mm and 3.94mm for group I and II, respectively. The mean union time was 10.9 weeks and 15.6 weeks, respectively. And the mean full weight bearing time was 4.5 weeks and 2.3 weeks, respectively, The mean sliding length of lag screw, union time, and full weight bearing time all had statistical significance (p<0.05).

Conclusion: We conclude that prostimal femoral nailing is more reliable than compression hip screw fixation as a treatment method for AO/OTA A2.2 intertrochanteric fracture.

Introduction/objectives: Periprosthetic fractures are difficult to treat and require complex treatment approach according to the involved extremity. The modified Stoppa approach is a less invasive approach, providing clear acetabular access for anatomical reduction and stable fixation is necessary to achieve optimal result and is highly dependent on the ability of the involved extremity.

Results: Uneventful bone healing was achieved in 42 cases. In two fractures (one type B1, one type C) nonunion and plate failure occurred. Two cemented stems were revised for aseptic loosening 6.5 and 7 years after fracture fixation. Uncontrollable prosthesis infection and sepsis in a rheumatoid (immunocompromised) patient required disarticulation of the involved extremity.

Conclusion: Periprosthetic femoral fractures are difficult to treat and require complex treatment approach according to risk assessment, fracture type, implant stability, bone stock and patient status. Using a treatment protocol of the Vancouver classification we obtained satisfactory outcome.

Introduction/objectives: Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Anatomical reduction and stable fixation is necessary to achieve optimal result and is highly dependent on the ability to get good exposure. The modified Stoppa approach has been described by Hirvensalo and later by Cole and associates. This approach provides excellent exposure of the acetabulum, quadrilateral surface and sacroiliac joint. When compared to extensile exposures has lesser complication rates, lower morbidity and shorterening of surgical time.

Results: All patients were men, aged between 20 and 63 years. No intraoperatively complications were found. One patient died from organic complications and another had deep venous thrombosis, without sequelae. Early mobilization was initiated on 1st day and weight bearing at 4 weeks. Overall a reasonable anatomical reduction was achieved, with satisfactory clinical outcomes and return to daily life activities.

Conclusion: The modified Stoppa approach is a less invasive approach, providing clear acetabular access for anatomical reduction and fixation and minimizing surgical complications, with better visibility approach of all anterior elements make it a good alternative to the classic ilioinguinal. Although we have obtained good functional results, there is a steep learning curve to take in account.

Introduction/objectives: We prospectively reviewed 90 cases of periprosthetic femoral fractures (125 cases treatment protocol of the Vancouver classification). The aim of this retrospective study was to evaluate the clinical outcome of surgical treatment of periprosthetic femoral fractures following total hip arthroplasty using treatment algorithm of the Vancouver classification.

Methods: Forty seven periprosthetic femoral fractures operated-on during the period 2004-2016 were followed-up retrospectively. There were 35 women and 12 men with mean age at the time of surgery 65.4 years (52-88 years). The mean follow-up for the group was 4.5 years (range, 1-13 years). Periprosthetic fractures were classified according to the Vancouver classification. The clinical evaluation was performed with the Harris hip score, the Western Ontario and McMaster University Osteoarthritis Index (WOMAC) and Short Form 8 (SF-8). Bone healing, implant survival, pain, function and complications were recorded. Bone healing and implant stability were evaluated clinically and on plain radiographs.

Results: Operative time, estimated blood loss, transfusion, hospital stay, tip-apex distance, change of neck shaft angle, and Parker and Palmer mobility scores were not significantly different between the two groups (p>0.05). However, the mean sliding length of lag screw was 8.13mm and 3.94mm for group I and II, respectively. The mean union time was 10.9 weeks and 15.6 weeks, respectively. And the mean full weight bearing time was 4.5 weeks and 2.3 weeks, respectively, The mean sliding length of lag screw, union time, and full weight bearing time all had statistical significance (p<0.05).

Conclusion: We conclude that prostimal femoral nailing is more reliable than compression hip screw fixation as a treatment method for AO/OTA A2.2 intertrochanteric fracture.

Introduction/objectives: Acetabular fractures are one of the most challenging complications after hip replacement. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Acetabular fractures are one of the most challenging complications after hip replacement. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery. Acetabular fractures are among the most difficult fractures to manage in orthopaedic surgery.

Methods: The authors present a case series of 7 patients with acetabular fractures, treated by open reduction and internal fixation by modified Stoppa approach, between Jan2017 and Dec2017. The patients were evaluated preoperatively with plain radiographs and CT scan and were assessed with a modified Harris Hip Score and Visual Analogue Scale postoperatively.

Results: All patients were men, aged between 20 and 63 years. No intraoperatively complications were found. One patient died from organic complications and another had deep venous thrombosis, without sequelae. Early mobilization was initiated on 1st day and weight bearing at 4 weeks. Overall a reasonable anatomical reduction was achieved, with satisfactory clinical outcomes and return to daily life activities.

Conclusion: The modified Stoppa approach is a less invasive approach, providing clear acetabular access for anatomical reduction and fixation and minimizing surgical complications, with better visibility approach of all anterior elements make it a good alternative to the classic ilioinguinal. Although we have obtained good functional results, there is a steep learning curve to take in account.
**P16 Trauma**

**P16-66**

**PATEL’S ANGLE AS A PROGNOSTIC FACTOR IN THE OSTEOSYNTHESIS OF GARDEN I AND II SUBCAPITAL FEMUR FRACTURES**

Rosario, P.*; Silva, F. (1); Caria, R. (1); Escobar, M. (1); Martina, J. (1)

**Introduction/objectives:** The Gold-standard for Garden I & II subcapital fractures treatment is osteosynthesis with 2 or 3 cannulated screws. Subcapital femoral fractures are known to cause many complications such as Non-union or Avascular Necrosis (AVN) of the femoral head. An increased Patel’s angle can be described in the literature as a prognostic fracture, with an increased angle correlating with a larger complication rate.

**Objectives:** To evaluate the Patel’s Angle as a prognostic fracture in the treatment of Garden I & II subcapital femoral fracture.

**Methods:** A sample of 42 patients underwent internal fixation with cannulated screws in a period of ten years with a minimum follow-up of 6 months, was retrospectively analyzed. These patients were divided in three groups according to the Patel’s Classification. We tested the correlations between an increased angle and the rate of complications.

**Results:** There were two cases of AVN (4.7%), three cases of Fixation Failure (7.1%) and one Non-union (2.3%) with a total complication rate of 14%. We couldn’t find a significant correlation between the Garden Classification (p=0.449) or the Patel’s Angle (p=0.667) and the complication rate. Age, time until surgery and pre-existing hip arthrosis, also did not correlate with an increased rate of complications.

**Conclusion:** The use of cannulated screws for internal fixation remains the Gold-standard for the treatment of these patients. Contrary to the literature, we couldn’t correlate the classic prognostic factors with the negative outcome associated with the osteosynthesis of the proximal femur.

**P16 Trauma**

**P16-443**

**TREATMENT OF PERIPROSTHETIC FEMURAL FRACTURES WITH UNCEMENTED MODULAR REVISION STEM WITH DPHYSSEAL HOLD: OUR EXPERIENCE**

Rossi, A. (1)*; Munegato, D. (2); Solin, R. (1); Zatta, G. (1)

**Introduction/objectives:** Objectives of this study is to evaluate mid-term results of a consecutive population of patients undergoing revision hip surgery due to a femoral periprosthetic fracture using a non cemented modular femoral stem with diaphyseal grip.

**Methods:** 40 patients affected by periprosthetic femoral fractures, 30 females and 10 males, mean age 71 years (range 48-87). 30 fractures classified as Vancouver B2 and 10 as B3. In 67% of cases pre-operative CT scan was performed. The use of cannulated screws for internal fixation remains the Gold-standard for the treatment of these patients. We observed one case of superficial infection and one implant dislocation which required revision surgery.

**Conclusion:** Patients were subjectively satisfied, with a mean postoperative Parker mobility score of 6.62 (range, 4-9). Three patients underwent late complications after surgery, one case of deep vein thrombosis that was medically treated. At latest functional follow-up, all patients were subjectively satisfied, with a mean postoperative Parker mobility score of 6.62 (range, 4-9). Three patients died at a mean of 11.32 months (range, 9-13) due to complications unrelated to index surgery.

**P16 Trauma**

**P16-67**

**METASTASES OF THE FEMUR, AETIOLOGY, DIAGNOSIS AND TREATMENT - A REVIEW OF OUR EXPERIENCE**

Rosario, P.*; Silva, F. (1); Caria, R. (1); Escobar, M. (1); Martina, J. (1)

**Introduction/objectives:** The skeleton is the most common location of metastatic lesions. The diagnosis of pathologic fractures should be routinely considered in patients with long-bone fractures, especially in the femur.

**Objectives:** Characterize the etiology, treatment and survival rate of patients with metastatic femoral lesions treated in our institution.

**Methods:** A sample of patients diagnosed with metastatic femoral lesion in our institution in a time period of 9 years was retrospectively analyzed. We reviewed the data for age, gender, etiology, primary manifestation, primary lesion, type of surgery, lesion location and survival rate of these patients.

**Results:** Between 2007 and 2016, a total of 17 patients were diagnosed in our institution with a mean age of 72 years. Fracture was the primary manifestation in 54% of patients. Most were subchondrocartilaginous (41.2%), followed by intracortical fractures (23.5%). Breast Cancer was the most prevalent primary site representing 35% of cases, Colon & Rectal Cancer was the primary lesion in 17.6%, and Lung in 11.6%. All the lesions were lytic. Three patients underwent hip arthroplasty, eleven were submitted to osteosynthesis with endomedullar nail, two patients were not operated for medical reasons and one patient was submitted to a Girdlestone arthroplastic resection. We observed a mortality rate at 1 and 5 years of 41% and 70% respectively.

**Conclusion:** Female dominance in our sample is in accordance to the literature has well has the higher incidence in the seventh and eight decades of life. Unlike previous studies, prostate, renal and thyroid cancer did not have a major contribution in our sample. Has expected, the survival rate of the patients was low with a high percentage of fatalities at the one year mark.

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**P16 Trauma**

**P16-31**

**B2 PERIPROSTHETIC FEMORAL FRACTURES AROUND PREVIOUSLY WELL-CEMENTED POLISHED STEMS CAN BE TREATED WITH OSTEOSYNTHESIS IN LOW-DEMAND PATIENTS**

Rosário, P.*; Otilhina, J. (1); Correia, F. (1); Zanetti, G. (1); Buttaro, M. (1); Piccaluga, F. (1)

**Introduction/objectives:** Although revision surgery remains as the gold standard for treatment of Vancouver B2 periprosthetic femoral fractures, minimally-invasive reduction and fixation (MIRF) may be considered in low-demand, elderly patients. Thus, we aimed to describe the outcome of a series of octogenarians with displaced B2 femoral fractures around a priorly well-cemented stem treated with osteosynthesis.

**Methods:** Between 2014-2016, 35 type B2 periprosthetic fractures were operated, of which 16 were treated with MIRF using a 4-4mm locking compression plate (LCP). We excluded 2 cases for having a cementless stem and 1 for being a cementless hemiarthroplasty. All cases had a hybrid total hip arthroplasty with a well-cemented polished stem (Barrack A or B) and consisted of low-demand patients, being at least American Society of Anaesthesiologists (ASA) Class III. Mean age at presentation was 89 years old (SD±3.42). Mean follow-up was 35 months (min, 18 months). Rehabilitation protocol consisted of early mobilization, walking initially with partial weight bearing.

**Results:** All cases healed uneventfully with no signs of subluxation, malalignment or plate breakage. At 20 days postoperatively, one case presented with a deep wound infection that required debridement and irrigation with implant retention. One patient developed a deep vein thrombosis that was medically treated. At latest functional follow-up, all patients were subjectively satisfied, with a mean postoperative Parker mobility score of 6.62 (ranges, 4-9). Three patients died at a mean of 11.32 months (range, 9-13) due to complications unrelated to index surgery.

**Conclusion:** In low-demand patients, reduction and fixation with LCP is a valid alternative for the treatment of B2 femoral fractures around polished stems.