

Spanish hip society congress abstracts

THE ROLE OF PREOPERATIVE OPTIMIZATION IN A "PATIENT BLOOD MANAGEMENT" PROTOCOL FOR TOTAL HIP ARTHROPLASTY

Cristian Pinilla Gracia, Luis Rodríguez Nogué, Alberto Hernández Fernández, Juan José Panisello Sebastián, Carlos Martín Hernández, Jesús Mateo Agudo

Hospital Universitario Miguel Servet, Zaragoza

Introduction: Total hip arthroplasty is a successful and safe surgical procedure which inherently carries a loss of blood. On elective surgery basis, implementation of a multimodal approach including optimization of preoperative hemoglobin level, hematopoiesis stimulation, minimization of blood losses and use of restrictive transfusion strategies, will result in a significant reduction of transfusion rates.

Objective: To present the clinical outcomes and the allogenic blood transfusion (ABT) incidence following the implementation of a program for preoperative anemia optimization, within the framework of a "Patient Blood Management" (PBM) protocol, in patients scheduled for primary total hip replacement.

Material and methods: Retrospective cohort study into the clinical outcomes and incidence of allogenic blood transfusion in primary total hip replacement. A study cohort (January 2017-December 2018, N = 384) was compared with a historical cohort (January 2015-December 2016, N = 333). Both groups follow the patient blood management protocol which was already in use (hematopoiesis stimulation, administration of topic tranexamic acid, and restrictive transfusion strategy). The only difference between groups was the use of the preoperative anemia optimization program, which was established in January 2007 in our center.

Results: The transfusion rate in the historical non-optimized cohort was 6.61% (22/333 patients had ABT), compared with 2.34% in the study optimized cohort (9/384 patients had ABT), a statistically significant difference ($p=0.008$) in transfusion rates after the implementation of the preoperative anemia optimization protocol of in the framework of our PBM program.

Conclusion: Our PBM protocol, including hematopoiesis stimulation, topical tranexamic acid administration, a restrictive transfusion policy, and the recent implementation of a program to optimize preoperative anemia, is a model for effective significant reduction of ABT in total hip arthroplasty.

TOTAL HIP ARTHROPLASTY FOLLOWING ACETABULAR FRACTURE IN MIDDLE -AGED ADULTS

DOES INITIAL FRACTURE MANAGEMENT AFFECT IMPLANT'S OUTCOME?

Delgado del Caño C¹, Zamora Vicente de Vera J^{1,2}, San Martín Martínez A³, Menéndez Martínez P³, Iglesias Durán E¹, Rodríguez de Oya R¹

¹Hospital Monográfico Asepeyo Coslada (Madrid), ²Hospital San Francisco de Asís (Madrid), ³Hospital QuirónSalud San José (Madrid), ⁴Hospital Central de la Cruz Roja (Madrid)

Introduction: Acetabular fractures are complex injuries of the hip joint. Even after a correct anatomic reduction, post-traumatic arthritis may develop over time. The results of total hip arthroplasty (THA) for post-traumatic osteoarthritis are generally inferior to those of THA performed for nontraumatic arthritis.

In this study, we compared the outcomes of THA among patients with failed acetabular fractures that were treated initially with or without surgery. The objective was to determine whether the initial fracture management affected the implant's outcome.

Methods: Retrospective cohort study using data from our institutional database of primary THAs performed between 2004 and 2017. Patients with post-traumatic arthritis following acetabular fractures who were < 60 years of age at the time of primary THA were included. A minimum follow-up of 2 years was required for inclusion in the study.

Demographic data, radiographic and functional assessment (Harris Hip Score, HHS) were reviewed. The primary outcome measure was implant survival.

Results: 34 patients (mean age at injury: 55 years) with previous acetabular fractures who underwent THA were

HIP International
1-40
© The Author(s) 2019
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1120700019870630
journals.sagepub.com/home/hpi



analyzed. Mean follow-up was 7.4 years (range 2 to 15 years). Twenty patients (59%) had suffered simple acetabular fractures and 14 (41%) had had complex fractures (Judet and Letournel classification). The acetabular fractures had been treated without surgery in 13 (38%) patients whereas in the remaining 21 (62%) THA was performed after osteosynthesis of the previous acetabular fracture. In none of the cases THA was performed as part of the initial fracture management. Four (12%) patients required revision of their THA; all had had their acetabular fractures treated surgically, and in 3 of those patients the revision was due to septic loosening.

Mean HHS score was 41.82 +/- 11.04 prior to arthroplasty and 93.65 +/- 7.22 after arthroplasty ($p < 0.001$, *t-student's test*). HHS scores were worse in patients who had undergone THA following surgically-treated acetabular fractures ($p = 0.395$, *t-student's test*).

Conclusions: THA provides a successful salvage option for failed acetabular fractures. In our study, revision surgery after THA was only needed in patients with acetabular fractures that had been initially treated with surgery, and the main cause was septic loosening of the implant. Functional results and implant survival were better in patients in whom their previous acetabular fractures were treated without surgery.

Conflict of interest

The authors report no conflict of interest.

OUTCOMES OF THE REVITAN FEMORAL REVISION STEMS. IS THERE A DIFFERENCE BETWEEN THE CURVED AND THE STRAIGHT STEMS?

María Cristina García Martínez¹, Víctor Manuel Barro Ojeda¹, Iñaki Mimendia Sancho¹, Alejandro Hernández Martínez²

¹Hospital Universitari Vall d'Hebron, Barcelona, ²Hospital Universitari Doctor Josep Trueta, Girona

Introduction: Modular straight Revitan revision stems reproduce the classic conical fixation of diaphyseal anchor of the Wagner-type stem. Its proximal modular segment allows an optimal adjustment of the length, the version and the femoral offset. On the other hand, curved Revitan modular revision stems maintain a conical fixation of diaphyseal anchor but introduce a quadrangular section of the femoral stem. Its main advantage lies in its ability to adapt to the anterior physiological curvature of the femur and the possibility of performing a distal locking. The objective of this study is to compare the clinical and radiological results of both types of implant.

Material and methods: Retrospective cohort study. The study population was all patients operated in Vall

d'Hebron hospital of total hip arthroplasty revision (THR) by using a Revitan modular revision stem between January 2010 and February 2018, with a minimum follow-up of two years.

A clinical analysis of the complications was performed. The integration of the stem, the area of femur-implant contact, the subsidence and analysis of survival were evaluated radiologically.

Results: 91 THR, 85 patients were introduced in the study. The mean follow-up of the patients was 4.3 years (2.2-8.5 years). The average age of the patients was 75.4 years (46.1-91.1 years). 39.6% of the cases (36/91) presented a septic loosening, 24.2% (22/91) an aseptic loosening and 22% (20/91) a periprosthetic fracture.

The survival of the stem was 100%, with no significant differences between the curved and straight stems.

No differences were observed in the femur-implant contact surface between one model and another.

No significant differences were observed in the rate of dislocation, subsidence and periprosthetic fracture between the curved stems and the straight stems.

Conclusion/discussion: Modular Revitan stems offer a stable and long-term fixation in revision surgery. The use of the curved stems theoretically allows an increase in the femur-implant contact surface and, in some cases, prevents the realization of an enlarged trochanter osteotomy. However, both types of stems show similar clinical and radiological results.

Conflict of interests: The authors deny any conflict of interest in this work.

CHRONIC INFECTION IN THE TOTAL HIP ARTHROPLASTY. OUR EXPERIENCE

Cristina Sánchez Losilla, Lorenzo Hernández Ferrando, Vicente Estrems Díaz, José Diranzo García, Francisco Jara García, Antonio Bru Pomer

Hospital General Universitario Valencia

Background: Infection at the site of a total hip arthroplasty is a complex clinical, surgical and resource consumption problem. In cases of chronic presentation, only the replacement of the prosthetic implant and appropriate course of antibiotics can resolve the process. This can be done in one or two stages, depending on the characteristics of the case and the experience of the surgical team. We present our experience with the two-stage reconstruction, currently the most common treatment modality.

Methods: We retrospectively studied 50 patients who had revision surgery at our center between 2007 and 2018 due to chronic periprosthetic infection.

The clinical data and scores were obtained at the Western Ontario and McMaster Universities (WOMAC)-Index at the Harris Hip Score (HHS) and at the visual analog score (EVA).

We valued the clinical, radiological and functional results of all the cases. Also, we studied the average time between both surgeries, the days of oral and intravenous treatment and the average time of the hospitalization.

Results: The average age of the patient at the time of surgery was 65.7 years old, the global survival rate was 94%, and the cure rate was 90.1%.

The average score reached in the HHS was 82.41, at WOMAC - score of 80.2 and of 1.67 at EVA.

During the follow-up, two patients had a post-surgical hematoma (4.6%), two patients had a dislocation (4.6%) and four patients had a reinfection (9.09%). On the other hand, no patients had any neurovascular injuries and none of them had loosening component. The most frequent microorganism was *Staphylococcus epidermidis*.

Conclusions: The two-stage reconstruction has allowed good clinical results; high survival of the implant and low rate of reinfection. The presence of important femoral and/or acetabular bone defects will require the use of complex material and the potential need for spongy or structural bone grafting.

THE FURLONG EVOLUTION® HIP STEM: A PROSPECTIVE STUDY OF CLINICAL RESULTS FROM 2013 TO THE PRESENT

Miguel Martínez Espinosa¹, Daniel Donaire Hoyas¹, Jesús Moreta Suárez², David Raya Roldán³, Manuel Sumillera García⁴, Alberto Albert Ullibarri¹

¹Hospital de Poniente, El Ejido, Almería, ²Hospital de Galdakao-Usansolo, Bizkaia, ³Hospital de Poniente, El Ejido, Almería, ⁴Hospital de Valdecilla, Santander

Introduction: Short stems have become an alternative to conventional stems in total hip replacement, although no long-term clinical trials have as yet demonstrated their results to be equivalent to those of conventional stems.

Purpose: The purpose of this study is to analyze the medium-term clinical and radiological results of the Furlong Evolution® stem in total hip arthroplasty.

Materials and methods: This was a prospective multicenter study of 166 patients treated with a Furlong

Evolution® short stem from April 2013 to the present with a minimum follow-up of one year. The following data were gathered: patient age, diagnosis, weight, operated side, surgical approach, bearing surface used, intra- and postoperative complications.

Clinical outcomes were evaluated using the WOMAC scale and the Harris Hip Score (HHS) preoperatively and again postoperatively at 3 months, 1 year and every 2 years thereafter.

A radiological analysis was performed of the positioning and fixation of the stem using the criteria established by Engh.

Results: The study analyzed 166 patients (129 men and 37 women). Mean patient age was 49.5 years. Mean follow-up was 28.2 months (range: 12-70). Mean BMI was 27.84, with 80.1% of patients affected by overweight or obesity. A posterior approach was used in 38 patients (22.9%) and a lateral approach in 128 cases (77.1%).

Metal-polycarbonate urethane (MoPCU) was the bearing surface used in 44% of cases; ceramic-on-ceramic (CoC) was used in 40.4% of cases and ceramic-on-polyethylene (CoP) in 15.7%.

Surgery resulted in significant functional improvement, with the HHS score increasing from 47.8 preoperatively to 92 at one year post-op. The HHS revealed no significant differences between the different bearing surfaces used.

The WOMAC scale also showed significant differences between pre- and postoperative status. The WOMAC pain scale attributed greater clinical improvement to the MoPCU and CoC groups than to the CoP group. Conversely, the CoP bearing surface obtained the best outcomes on the WOMAC stiffness scale. No statistically significant differences were identified in any of these parameters.

There were no stem-related intraoperative complications. Postoperatively, there were 2 superficial and 3 deep infections.

Five patients in the MoPCU group reported squeaking in their hip joint, all of which resolved spontaneously within the first few months post-op. No cases of loosening were observed.

Conclusions: The outcomes and complication rates of the short stem under analysis proved to be equivalent to those of conventional femoral implants.

The different bearing surfaces resulted in similar improvement rates, with no statistically significant differences observed on the functional scales used.

The results of this study indicate that this stem can be used as an alternative to the conventional longer hip stems. It will however be necessary to keep gathering data on the long-term evolution of both the implant itself and on the different bearing surfaces to be able to draw any firm conclusions.

Keywords: stem, bearing surface, total hip replacement, functional scale.

TOTAL HIP REPLACEMENT IN PATIENTS WITH IDIOPATHIC SHORT STATURE

Raya Roldán D.¹, Donaire Hoyas D.¹, González Gutiérrez J. A.¹, Ruiz García S. P.¹, Martínez Espinosa M.¹, Esteo Pérez M. I.¹, Albert Uliibarri A.¹

¹Hospital de Poniente, Cirugía Ortopédica y Traumatología (El Ejido, Almería)

Introduction: Short stature is a relatively uncommon reason for consultation at the trauma surgery unit. The condition is often caused by endocrine-metabolic conditions arising during childhood. Most patients who present to our unit with this condition are adult individuals requesting a **clinical-therapeutic** assessment of joint status.

The most effective radiological tests to diagnose the bony alterations that usually characterize this condition are **plain x-rays** and **CT-scans**.

An understanding of the condition is key to ensure appropriate orthopedic treatment, especially considering the **anatomic deformities** that usually characterize these patients.

Purpose: To describe a **therapeutic orthopedic approach** to an **adult** patient presenting with **bilateral hip dysplasia** and associated **idiopathic short stature**.

Materials and methods:

The subject is a **31-year-old** Moroccan male with short stature, not studied previously in his country of origin. Patient weight is 34 kg and his height is **130 cm**.

The physical examination revealed that the subject was of **short yet well-proportioned stature**. He exhibited a **severe valgus deformity of the left lower limb** as well as leg length discrepancy, and reported pain in the left knee and bilateral groin pain. Motion of both hips was limited, particularly that of the left hip.

A full radiological study was performed, which included AP and axial hip radiographs as well as lower limb telemetry and 3D CT-scan.

The first surgical stage consisted of a **constrained total left knee replacement** to address a valgus deformity and

the disabling pain reported by the patient. Three months later, the ipsilateral hip underwent an arthroplasty.

Prior to the hip replacement, but during the same procedure, an **adductor tenotomy** was carried out to facilitate the arthroplasty and enhance the patient's functional recovery.

The surgery was performed using a **posterior approach**. The smallest size (size 8) of the **Novation® (Exactech)** uncemented stem was used for the **total hip replacement**. A **38 mm cup** of the same manufacturer was also used, as well as a **22 mm metal** head and two 20 mm **fixation screws**.

Results: Intraoperatively, a **satisfactory range of motion** and **good implant stability** were achieved.

A postoperative x-ray revealed **correct placement** of the total hip prosthesis.

Postoperative evaluation of the **functional outcome** indicated that 80° of flexion and full extension had been achieved at one month from surgery.

The patient did not complain of pain in the operated hip, but did report pain in the contralateral hip, which is pending surgery for **high-riding hip dysplasia (Hartofilakidis type III)**.

Conclusions:

- Appropriate treatment of these patients requires a **full clinical and radiological study**.
- A **posterior approach** facilitates work in the acetabulum and allows the performance of any necessary osteotomies.
- **Preoperative planning** is essential in these cases. Special undersize implants must be kept in stock for short stature patients.
- An **adductor tenotomy** is a surgical maneuver that helps the surgeon perform the arthroplasty and improve range of motion.
- Special emphasis should be placed during the postoperative period on restoring functional range of motion. **Early weight-bearing** is recommended.

Keywords: hip dysplasia, short stature, total hip arthroplasty.

References:

1. Miller, MD. Review of orthopaedics (6th Ed.) Philadelphia: Elsevier 2012.

2. Miller M, Thompson S. Section 9 and 10. Pediatric Orthopaedics. Miller's Review of orthopaedics. 7^a Ed. Ed. Elsevier, 2016.
3. A. D. Delgado Martínez. Manual de Cirugía Ortopédica y Traumatología. 4^a Ed. Madrid: Editorial Médica Panamericana, 2018.

MID-TERM CLINICAL AND RADIOLOGICAL RESULTS OF REVISION TOTAL HIP ARTHROPLASTY IN PATIENTS AGED YOUNGER THAN 60 YEARS

Diego De Godos Martínez, Ana Cruz Pardos, Ricardo Fernández Fernández, Enrique Gil Garay

Hospital Universitario La Paz, Madrid

Introduction: Revision total hip replacement is a technically demanding surgery, because of the potential difficulties to retire the previous implants and the loss of bone stock. In younger patients (less than 60 years), there are other aspects that hinder the achievement of optimal outcomes: higher functional demands, the need to optimize the survival of the implants and, in some cases, a distorted anatomy secondary to pediatric pathologies.

Objectives: The purpose of this study was to know the clinical and radiological results obtained in patients aged younger than 60 years that had undergone surgery for revision of total hip arthroplasty in our hospital, with special interest in complications, functional results and survival of the implants.

Material and methods: We performed a retrospective analysis of medical records and radiographic studies of patients aged younger than 60 years that had undergone revision total hip replacement surgery between the years 2007 and 2017. We recorded demographical data, cause of the primary total hip replacement, cause of the revision, time until revision, complications and functional results. We carried out the clinical evaluation employing the Merlé d'Aubigné-Postel score. We performed radiologic measurements of the implants. We performed statistical analysis of the data and survival analysis of the implants with Kaplan-Meier curves.

Results: 75 patients were included in the study. The mean age was 49.7 years (29 to 59). The mean follow-up was 4.24 years (1 to 11). The mean time until revision was 12.9 years (3 months to 28 years). The main cause of revision was the aseptic loosening of the acetabular component (forty patients, 53 %). At the end of follow-up, we noticed a statistically significant improvement of the Merlé d'Aubigné-Postel score (Wilcoxon test $p < 0.05$). There

were four (5.3%) cases of dislocation and three (3.9%) cases of infection. Six patients (8%) had to undergo a new revision surgery. The estimated survival rate at five years was 89.9 % [CI: 81.5-98.3].

Conclusions: In spite of being younger patients, revision total hip arthroplasty has good mid-term outcomes in patients aged younger than 60 years. A longer follow-up is required to confirm this results.

DO COMORBIDITIES AND FIXATION TYPE AFFECT THE OUTCOME IN OCTOGENARIAN UNDERGOING A TOTAL HIP ARTHROPLASTY? COMPETING RISK ANALYSIS

Eduardo Garcia-Cimbrello

Hospital Universitario La Paz, Madrid

Introduction: Comorbidities are frequent in octogenarian patients undergoing total hip arthroplasty (THA) and cementless implants use is rising in this population.

We ask whether patients' comorbidities affected the clinical outcome of three current cemented and cementless THAs in octogenarians.

Methods: 382 patients (441 hips) over 80 years old underwent THA between 2004 and 2015. Only patients with primary osteoarthritis and ASA class II or III were included. Patients were classified as: Group 1, received a cemented stem (196 hips); Group 2, a cementless grit-blasted stem (121 hips); and Group 3, a cementless proximal porous-coated stem (124 hips). Given these patients' life expectancy, they were followed for a minimum of three years, and the survival analysis was calculated using cumulative incidence function to account for the competing risk of death.

Results: Patients were older ($p < 0.001$), had more neurological disability ($p = 0.004$) and comorbidities ($p = 0.033$) in group 1. One patient deceased due to a pulmonary embolus in group 1. Overall blood transfusion rate was 25%. There was one intraoperative femoral crack in group 1, five in group 2 and five in group 3; one postoperative fracture in group 2 and two in group 3. At latest follow-up mean Harris Hip Score was better in group 3 ($p < 0.001$). Three hips were revised in group 1, six in group 2 and four in group 3. 10 years cumulative incidence of revision for any cause was better in group 1. 10 years cumulative incidence of revision for aseptic loosening was better in group 3 than in the others.

Conclusion: Despite overall THA outcome in octogenarian patients is good with both types of fixation, periprosthetic fractures were more frequent after cementless implants.

The acceptable complication rate ought to be considered when THA is offered to these patients.

BONE DEFECT IN ACETABULAR RE-REVISION SURGERY WITH IMPACTION BONE GRAFTING AND A CEMENTED CUP

Eduardo Garcia-Rey, Eduardo Garcia-Cimbreló

Hospital Universitario La Paz, Madrid

Introduction: Biological repair of acetabular bone defects after impaction bone grafting (IBG) in total hip arthroplasty could facilitate future re-revisions in case of failure of the reconstruction again using the same technique.

The objective has been to study clinical and radiographic outcomes of re-revisions again using IBG and a cemented cup.

Patients and Methods: We analysed 34 consecutive acetabular re-revisions that repeated IBG and a cemented cup in a cohort of 330 acetabular IBG revisions. Fresh-frozen femoral head allografts were morselized manually. All data were prospectively collected. Kaplan-Meier survivorship analysis was performed. The mean follow-up after re-revision was 7.2 years (2-17). Intraoperative bone defect had lessened after the first failed revision, at the first revision there were 14 hips with Paprosky type 3A and 20 with Paprosky type 3B, at the re-revision there were 5 hips with Paprosky type 2B, 21 with Paprosky type 3A and 8 with type 3B.

Results. The mean Harris Hip Score improved from 46.54+5.7 to 79.7+11.8 at final follow-up. The radiological analysis showed cup migration in 11 hips. Survival with further radiological cup migration was 56.9% (95% Confidence interval (CI): 36.6-77.2) at 6 years. Of these, migration in three cups was progressive and painful requiring re-revision. Survival with further cup revision for aseptic loosening was 85.3% (95% CI:69.0-100) at 6 years. Cup tilt was found in all migrated hips. Cup migration was more frequent in cases with a preoperative cranial defects ($p=0.012$) and higher rotation centre of the hip distance ($p=0.046$). In all surviving re-revisions trabecular incorporation was observed without radiolucent lines.

Conclusion: Biological repair can be obtained by restoring the bone stock using IBG and a cemented cup in acetabular revision surgery facilitating future re-revisions.

Aubigné-Postel score (Wilcoxon test $p<0.05$). There were four (5.3%) cases of dislocation and three (3.9%) cases of infection. Six patients (8%) had to undergo a new revision surgery. The estimated survival rate at five years was 89.9 % [CI: 81.5-98.3].

Conclusions: In spite of being younger patients, revision total hip arthroplasty has good mid-term outcomes in patients aged younger than 60 years. A longer follow-up is required to confirm this results.

PUBIC SYMPHYSIS OSTEOMYELITIS. WHERE THE ORTHOPEDIC SURGEON MEETS THE UROLOGIST

Ester Blanch, Mario A. Jarma, Carmen B. Pensado, Petrea Iftimie, Juan T. Gebelli

Hospital Sant Pau i Santa Tecla de Tarragona

Objective: To report on clinical features and the treatment of pubic bone osteomyelitis with pubovesical fistula as an uncommon cause of suprapubic pain, and to allow its diagnosis and multidisciplinary treatment.

Materials and Methods: A 78-year-old man was referred to our Orthopedic Unit, after having suffered for suprapubic discomfort, left inguinal pain and difficulty with ambulation, during one year.

As medical history, we have remarked a prostate adenocarcinoma treated with radiotherapy and transurethral resection 6 years ago, and proximal femur fracture 25 years ago.

Radiographs, pelvis magnetic resonance imaging, urological-TC and scintigraphy were performed, whose findings suggest the diagnosis of pubic osteomyelitis with an associated pubosymphiseal urinary fistula.

Multidisciplinary approach coordinated with a reconstructive urologist, infectious disease specialist and orthopedic surgeon was applied.

Surgical treatment involved resection pubis bone and fistulous connection, and reconstruction of the vesicourethral anastomosis. A urinary diversion was maintained for 5 weeks and antibiotic therapy for 8 weeks.

Results: At the one year follow-up, the patient is painless and has achieved a full recovery of their daily activities and ambulate without a walker.

Discussion and Conclusion: Pubic bone osteomyelitis with an associated pubovesical fistula is a rare complication of prostate cancer treatment.

Diagnosis requires a high index of suspicion. In a patient with recurrent urinary infections, difficulty with ambulation and suprapubic discomfort, and history of prostatectomy and/or radiotherapy, should be suspected.

Multidisciplinary management must be carried out.

The goal of treatment is to resect the nonviable bone. There are different types of pubis osteotomy. The trapezoidal pubic bone resection that we have performed, permits better maintenance of an anterior pelvis stability.

ACETABULAR REVISION AT 92 YEARS-OLD. IS AGE A LIMITING FACTOR IN HIP ARTHROPLASTY REVISION SURGERY?

Ester Mora Solé, Bárbara Nicolau Miralles, Juan Cabello Gallardo, José Antonio Hernández Hermoso, Guillem Figueras Coll

Hospital Universitari Germans Trias i Pujol, Badalona

Introduction: In recent years, the number of total hip arthroplasties has been increasing in both young and elderly patients with poor bone quality due to the extension of surgical indications. According to this trend, revision surgery has also shown an increase, especially in elderly patients, due to the implant loosening, failure in the bone integration of the prosthetic components, errors in the biomechanical restoration and infections.

Objective: We present the case of an elderly patient with multiple episodes of prosthetic dislocation, in which possible treatments assessment and a bibliographic review are carried out.

Material and Methods: A 92-years-old man underwent surgery using a Moore prosthesis for subcapital fracture of the femur Garden III at age 82, which after a two-stage septic replacement with implantation of Charnley total hip prosthesis, suffers six episodes of prosthetic dislocation, treated by closed reduction, without associated complications. The patient had been a carrier of containment orthosis due to the associated high surgical risk (ASA III). During the maneuvers to reduce the last dislocation, a loosening of the acetabular component was evident.

Four treatments were proposed: orthosis maintenance, Girdlestone, replacement of both prosthetic components or only acetabular component. The first two were discarded because the last dislocation episodes occurred while wearing the orthosis and initially the patient was independent for the BADL. Only acetabular component revision was chosen due to the risk of bleeding associated with femoral replacement and great bone fragility due to advanced age, so a double mobility cup was placed.

Results: After a week, he started walking with partial load and after six months, he was able to walk autonomously with support using two crutches.

Conclusions: Arthroplasty revision surgery in elderly patients can offer important benefits in relation to quality of life, independence and life expectancy, although it has a

significant risk because they are multi-pathological and fragile patients.

It requires a correct assessment and preoperative planning to predict the surgical risks and bone defects, in order to determine the best surgical option.

There is a correlation between the preoperative risk and the postoperative medical complications; although the rate of medical complications cannot differ significantly of patients of seventy years or younger, due to the anticipation of complex cases and previous medical optimization.

Through a rigorous selection of patients, preoperative optimization and surgical planning, satisfactory results can be expected after revision surgery, without age being an impediment to its indication.

Bibliography

- Parvizi J, Pour AE, Keshavarzi NR, D'Apuzzo M, Sharkey PF, Hozack WJ: Revision total hip arthroplasty in octogenarians. *J Bone Joint Surg Am.* 2007; 89(12): 2612-8.
- Raut VV, Wroblewski BM, Siney PD: Revision hip arthroplasty: can the octogenarian take it? *J Arthroplasty.* 1993; 8(4): 401-3.
- Ballard TW, Callaghan JJ, Johnston RC: Revision of total hip arthroplasty in octogenarians. *J Bone Joint Surg Am.* 1995; 77(4): 585-9.
- Gasbarra E, Perrone FL, Celi M, Rao C, Feola M, Cuozzo N, et al: Total hip arthroplasty revision in elderly patients. *Aging Clin Exp Res.* 2013; 25 (Suppl 1): S61-3.
- Grey MA, Keggi KJ: Revision total hip arthroplasty in a centenarian. A case report and review of the literature. *J Arthroplasty.* 2006; 21(8): 1215-19.
- Pagnano MW, McLamb LA, Trousdale RT: Primary and revision total hip arthroplasty for patients 90 years of age or older. *Mayo Clin Proc.* 2003; 78(3): 285-8.

CLINICAL AND RADIOLOGIC OUTCOMES IN TOTAL HIP ARTHROPLASTY PERFORMED IN PATIENTS WITH SPONDYLOEPIPHYSEAL DYSPLASIA

Fernando Escámez Fernández, Javier Gómez Luque, Ana Cruz Pardos, Ricardo Fernández Fernández, Enrique Gil Garay

Hospital Universitario La Paz, Madrid

Introduction: Patients with a bone dysplasia can present bone deformities that can accelerate joint degeneration. In many cases, different surgeries are made to correct these deformities. Finally, many patients can need a total hip arthroplasty (THA). Anatomic abnormalities, bone quality and the use of smaller implant could affect long term outcomes of THA.

Objective: The purpose of this study is to analyse the radiological and clinical outcomes of THA performed in patients with Spondyloepiphyseal dysplasia (SED).

Methods: In this retrospective study we reviewed all THA implanted in patients with SED between 2014 and 2018 at our institution. The mean follow up was 26 months. Uncemented implants were implemented in all cases. Demographic data, weight, height, BMI and previous activity were registered. Clinical outcomes were evaluated with the Harris Hip Score and WOMAC score. We assessed the implant position, radiolucent lines and osteolysis around the cup or stem according to De Lee Charnley and Gruen zones respectively. Fixation of the implants were determined following Engh criteria. Kaplan-Meier survival analysis with 95% confidence intervals was used to assess implant survival at 5 years.

Results: Eight patients (ten hips) with a mean age of 34 (range; 14-56) years old were included. Mean height was 149 cm (range; 96-166 cm). Acetabular cup median size was 50 (Range; 44-54) and femoral head median size was 36 (Range; 28-36). The most frequent bearing surface was ceramic on ceramic. Harris Hip Score and WOMAC significantly improved ($p < 0.05$) in all patients postoperatively. The mean inclination of cup position was 44.5°. Three cups had a non-progressive radiolucent line. All stems showed radiological signs of osteointegration. Only one patient underwent cup revision due to early dislocation. At 5 years, the cumulative probability of not having a revision for aseptic loosening was 100%.

Conclusions: SED does not affect implant fixation of non uncemented implants. THA is a procedure that can have excellent radiologic and clinical outcomes in this type of patients. Nevertheless future studies with longer follow up are necessary to confirm our findings.

HIP RESURFACING. FIVE TO TEN YEARS FOLLOW UP BY THE HIP UNIT IN HOSPITAL DEL MAR BARCELONA

Fernando Marques, Marta Cuenca, Vito Andriola, Anna Fraile, Marc Tey, Alfonso Leon

Parc de Salut Mar .Barcelona

Purpose: International series registry data have demonstrated positive outcomes and long term survivorship of

the hip resurfacing. The goal of this study is to valorate its functional results and survivorship five to ten years after the implantation of Durom HRS (Zimmer GmbH, Winterthur). Our hypothesis is that functional results and survivorship are good for selected patients according to FDA criteria.

Methods: A retrospective case control study (2005-2013) in 83 patients in 91 hips, 8 bilateral was performed. Clinical outcome based on Merle Postel D'Aubigne scale and short SF 12.was applied .Complications and reoperations with a minimal follow up of 5 years were evaluated. The radiological valuation by PACS system included: components orientation, neck narrowing, offset and bone fixation (Engh scale). Laboratory panel quantified the level of chrome and cobalt in serum. Also we selected the patients according to the FDA criteria (young males < 60 and heads > 48 mm).Statistics SPSS.

Results: 4 patients died and 3 were lost during the follow up so the final study group was 76 patients,82 hips,69 men and 7 women with median age of 52.78.The MPD scores significantly improved postoperatively from 13.5 to 17.5 ($p < 0.001$) remaining in time. Global survivorship was 84.14% and 86.8% for aseptic loosening. We found 2 infections, 4 femoral neck fractures, 4 cup loosening and 2 pseudotumors with 12 reoperations, highlighting that 50% happened during the beginning of the learning curve. In 81 cases (88%) the components were correctly orientated in the good position with 4 cases (5%)with neck narrowing. Chrome and cobalt average levels were < 1 .According to FDA criteria the global survivorship was 93.15% and 94% for loosening or fracture (1 fracture, 1 pseudotumor and 3 cups loosening).

Conclusions: Hip resurfacing indicated for very selected patients (young active male, < 60 years old with heads bigger than 48 mm),obtained a good survivorship and functional results five to ten years after surgery once the learning curve is achieved.

DISTAL FIXATION MODULAR STEMS WITH LOCKING SCREWS IN HIP REVISIONS WITH SEVERE FEMORAL DEFECTS

Fernando Marques López, Aleix Sala Pujals, Anna Fraile Suari, Ignacio Stacey Ruales, Marc Tey Pons, Alfonso Leon Garcia-Vao

Parc de Salut Mar, Barcelona

Purpose: Complex femoral defects with isthmus compromise (Paprosky III and IV) and B3 (Vancouver) periprosthetic fractures determine the stem fixation technique chosen in revision surgery. Tapered modular stems with distal fixation can be a good option. The goal of this study

is to evaluate the results of modular stems with locking screws using the Revitan curved system (Zimmer Biomet GmbH, Winterthur, Switzerland) for revision with isthmus damage. Our hypothesis is that modular stems with screws are a viable option with good and stable fixation.

Methods: A retrospective case control study in 38 patients with severe femoral defects with a minimum follow up of 12 months, using the Revitan Curved stem with screws was performed. We used the Vancouver classification for periprosthetic fractures, Paprosky classification for femoral defects and Engh classification for the bone fixation. Functional outcome was evaluated according to the Merle Postel D'Aubigne scale. Types and number of complications and reoperation were collected. We used the SPSS with a $P < 0.5$ level of significance for statistics.

Results: 38 patients (23 men and 15 women) of median age of 74 and a median follow up of 64 months were included. 15 cases septic revision, 14 aseptic revisions, 2 fractures and 7 extended transtrochanteric osteotomy were the etiology. The average of previous operations was 2.7 and the most frequent defect was III B Paprosky (21 cases). We obtained a good fixation in 26 cases with 4 loosening and 3 mechanical screw failures. We found 3 infections, 1 dislocation and 1 femoral nerve injury. The MPD score increased significantly from 11.26 to 14.98 at the end of the study.

Conclusions: Modular femoral stems with screws are a good alternative for the treatment of severe femoral defects and isthmus damage if there are a good filling of the canal.

IN VITRO EVALUATION OF BACTERIAL ADHESION AND BIOFILM FORMATION TO METALLIC CERCLAGE WIRE VERSUS POLYMER CERCLAGE SYSTEM

F. Anglès-Crespo; M. Bernaus-Johnson; A. Bartra Ylla; S. Miguela Alvarez; L. Font-Vizcarra

Hospital Universitari Mútua Terrassa

Aim: To evaluate bacterial adhesion and biofilm formation to metallic cerclage wire versus polymer cerclage system (SuperCable®).

Methods: Experimental *in vitro* study to evaluate quantitative bacterial adherence to different cerclage wire materials. Two types of cerclage wires were compared: a metallic versus a polymer based wire (SuperCable®).

A two-centimeter cerclage wire piece of each material was included in 2 mL of tryptic soy broth (TSB) culture medium, inoculated with 10 microliters of a 0.5 McFarland of a *Staphylococcus epidermidis* strain and cultivated at 37°C during 2h for adhesion and 48h for biofilm formation. After

this time, the cerclages were washed using a 1% phosphate buffered saline (PBS) and sonicated in new culture medium. After sonication, dilutions of each culture were spread in TSB agar and incubated 37°C during 24h. The number of colonies was counted and the cfu/cm² was calculated.

Bacterial adherence and biofilm formation was demonstrated by scanning electron microscopy (SEM).

Results: There were no differences in the number of colonies counted at 2 hours.

At 48 hours, the polymer cerclage system showed a clinically and statistically reduction of 95.2% in the biofilm formation of *S. epidermidis*.

The highest bacterial counts were observed in metallic cerclages after 48h.

Conclusion: In *in vitro* conditions, the polymer cerclage system may offer decreased biofilm formation compared with metallic cerclage wires. However, there are many other factors in *in vivo* conditions that could play a role in bacterial adhesion to cerclage wires. Further research is needed in order to recommend the use of polymer cerclage systems for septic revision surgery.

OSSIFICATION AFTER PROXIMAL RECTUS FEMORIS AVULSION: UNUSUAL CAUSE OF SUBSPINE IMPINGEMENT

Francisco Ferrero Manzanal¹, Antonio Murcia Asensio², Raquel Lax Pérez², Juan Carlos Rivas Garnica¹, María José Ros Nicolás¹, Miguel Angel Sánchez Carrasco¹

¹Hospital General Universitario Santa Lucía, Cartagena, ²Hospital General Universitario Reina Sofía, Murcia

Surgical technique. - Objectives: to show a case report and surgical technique for treating the subspine impingement (ossification resection and proximal rectus femoris reinsertion).

Methods: we present a case of a 17-year-old patient that suffers from acute pain in his left hip with functional impairment. The x-rays showed fracture in the supracetabular region. The CT scan diagnosis was fracture of an ossification secondary to old fracture-avulsion of proximal *rectus femoris*. He was treated nonoperatively. After fracture healing the patient had limitation for flexion and external rotation of the hip with pain. The diagnosis was subspine impingement, and he was proposed for surgery. An anterior approach was performed, the bone exostosis was resected and the *rectus femoris* was reinserted by using bone anchors.

Results: The patient recovered very fast. With a follow-up of 6 months the patient does not have any pain. The flexion-rotation restriction disappeared.

Conclusions: the subspine impingement is an unusual cause of hip pain and limitation of movement. The complete range of motion of the hip has to be carefully evaluated and correlated with radiological images to perform a correct surgical treatment. Although arthroscopy may be an indication, in cases where wide resection is needed, we recommend open surgery.

FAILURE OF CONSTRAINED LINER: 3 CASE REPORTS

Francisco Ferrero Manzanal¹, Antonio Murcia Asensio², Francisco Saura Sánchez¹, Lorena Fontao Fernández¹, Miguel Angel Sánchez Carrasco¹, Abdalaziz Lanagran Torres²

¹ Hospital General Universitario Santa Lucía, Cartagena, ² Hospital General Universitario Reina Sofía, Murcia

Objectives: recurrent total hip replacement dislocation is a challenge for orthopaedic surgeons. Constrained cups are an option for treating or preventing such complication, above all in cases of abductor mechanism impairment, and low functional demands. The objective of this work is to report 3 cases of constrained liner failure with metallic ring (3 different types).

Methods: 3 cases of hip surgery with high risk of dislocation are exposed, in which constrained liners with metallic ring for preventing dislocation were used (2 cemented, 1 uncemented).

Results: in the postoperative period, a metallic ring disassembly was seen in the three cases.

Conclusions: the constrained liners with metallic ring are demanding to implant with regards to ring impaction. Care must be taken in this step avoiding soft tissues interposition or plastic deformation by asymmetrical impaction.

TOTAL HIP INFECTION ASSOCIATED WITH PELVIC DISCONTINUITY: CEMENT-PROSTHESIS SPACER BRIDGING THE DISCONTINUITY

Francisco Ferrero Manzanal¹, Francisco Saura Sánchez¹, Antonio Murcia Asensio², Raquel Lax Pérez², María Murcia Gómez¹

¹ Hospital General Universitario Santa Lucía, Cartagena, ² Hospital General Universitario Reina Sofía, Murcia

Objectives: to show the surgical technique of cement-prosthesis spacer implantation in a case of total hip replacement infection with pelvic discontinuity.

Methods: we present a case of a 74-year-old lady with infection of total hip replacement with loosening of cup

and severe bone destruction and pelvic discontinuity. The critical situation of the patient did not allow for plate bridging and conventional cement spacer. To perform the surgery as fast as possible, a cement-prosthesis spacer was used by stabilizing the pelvic discontinuity with a cement-cup-screws construct bridging both sides of the discontinuity (screws placed in ischium and ilion). Then a cemented stem without pressurization of cement was used in the femoral part with a metallic head of 36 mm diameter (Exeter “kiwi” technique).

Results: the postoperative x-ray was correct; the patient tolerated sitting position with good pain control.

Conclusions: the cement-prosthesis spacer bridging the pelvic discontinuity may be a fast option for treating total hip infection with severe bone destruction when the general condition of the patient is not good.

ADENOCARCINOMA METASTASIS IN THE TROCHANTERIC BURSA AREA THAT MIMICS TOTAL HIP REPLACEMENT INFECTION: CASE REPORT

Francisco Ferrero Manzanal¹, Antonio Murcia Asensio², María José Ros Nicolás¹, Francisco Saura Sánchez¹, Belén Níguez Sevilla¹, Lázaro Ibáñez Martínez¹

¹ Hospital General Universitario Santa Lucía, Cartagena, ² Hospital General Universitario Reina Sofía, Murcia

Introduction and objectives: pain after total hip replacement can be easily attributed to infection when systemic symptoms appear. The objective of this presentation is to show a case of misdiagnosis of infection in the context of recent total hip replacement (THR) implantation.

Methods: we present a case of a 66-year-old patient that suffers from progressive left hip pain two months after an ipsilateral total hip replacement surgery (due to severe osteoarthritis). The patient had general symptoms that were attributed to sepsis. He had anorexia and weight loss associated. The initial diagnosis was wound infection of the THR. The ultrasound study showed periarticular effusion that suggested hematoma. The patient was operated by recommendation of Internal Medicine in order to drain/take samples. The findings were oedema in the subcutaneous tissue. Neither haematoma nor pus was seen at the time of surgery. Two tumours were seen and resected in the trochanteric area. The samples were sent to the Pathology Department.

Results: the Pathology results suggested adenocarcinoma metastasis. The immunohistochemistry studies oriented to the lung as the origin of the primary tumour. The chest CT scan showed a mass that invaded the major fissure. It also showed mediastinum nodes. The pelvic CT scan discarded

THR infection. The final diagnosis was hip pain secondary to lung adenocarcinoma metastasis.

Conclusions: in some cases, systemic symptoms may mimic prosthesis complications. An exhaustive investigation and physical examination must be done in order to avoid misdiagnosis.

FEMORAL NECK ANEURISMAL BONE CYST WITH ASSOCIATED FRACTURE IN A 14-YEAR-OLD PATIENT: CASE REPORT

Francisco Ferrero Manzanal, Juan Carlos Rivas Garnica, María José Ros Nicolás, Belén Níguez Sevilla, Lázaro Ibáñez Martínez

Hospital General Universitario Santa Lucía, Cartagena

Objectives: to report a case of an adolescent with a pathologic fracture of femoral neck secondary to aneurismal bone cyst and the treatment strategy.

Methods: we present a case of a 14-year-old patient that complains from a sudden hip pain with functional impairment after a minimal trauma. The x-rays showed femoral neck fracture in the context of cystic lesion. A CT scan was done. The initial diagnosis was unicameral bone cyst versus aneurismal bone cyst. Surgery was performed by a lateral approach. The procedure consisted on curettage of the lesion, treatment with phenol for 5 minutes and washing with 70% alcohol. Then impacted defrosted cryopreserved allograft was done through a bone window and the fracture was stabilized by a paediatric proximal locking plate (Synthes).

Results: the clinical evolution of the patient was very good. After 3 years of follow-up is asymptomatic, with x-ray images of incorporation of the graft, without signs of tumour recurrence. The only sequel is a shortening of 1 cm of the ipsilateral lower limb without functional limitation.

Conclusions: aneurismal bone cyst is a benign osteolytic lesion but locally aggressive, that is located in the metaphyseal region of long bones (above all in the femur). A careful surgical approach and a strict postoperative follow-up must be done due to the high rate of recurrence.

PROSPECTIVE STUDY: EFFECT OF THE INSERTION GUIDE LENGTH ON FRACTURE REDUCTION IN TROCHANTERIC FRACTURES

Francisco Ferrero Manzanal¹, Antonio Murcia Asensio², Raquel Lax Pérez², Abdalaziz Lanagran Torres², Iván Morales González²

¹Hospital General Universitario Santa Lucía, Cartagena, ²Hospital General Universitario Reina Sofía, Cartagena

Introduction and objectives: the quality of fracture reduction has been associated classically with the clinical result in hip fracture surgery. The “Zimmer natural nail” (ZNN) has two different insertion guides (short, long). Our hypothesis is that the long insertion guide hits on the soft tissues/ilion with the result of overdistraction and varus displacement in trochanteric fractures. The distraction therefore, can increase bleeding in the postoperative period. The objectives of this study are to comparatively evaluate the fracture reduction and bleeding with the use of both types of guide.

Methods: a prospective, non randomized comparative study was performed in 51 patients that suffered from trochanteric fracture treated by the ZNN nail, establishing 2 groups (“long guide”: 24 cases, “short guide”: 27 cases). Evaluation of x-rays and blood test was done.

Results: in the group “long guide” the distance increase between the femoral neck medial cortex and the medial cortex of the distal femur from preop to postop was higher as well as a decrease in the femoral-neck angle, although no statistically significant differences were observed.

Discussion: the results of this study are not conclusive so we are not able to accept the initial hypothesis, although a tendency of medial displacement and varization of the neck-head fragment was seen in the group “long guide”. Additional studies with a higher number of cases are necessary to confirm or discard the observed tendency and the possible relationship between the lateralization of the femur by the long guide in terms of complications or fracture reduction.

VARIABLE ANGLE CEPHALOMEDULLARY NAIL: NEW DESIGN OF IMPLANT FOR MINIMIZING MALREDUCTION TREATING REVERSE OBLIQUE INTERTROCHANTERIC FRACTURES

Francisco Ferrero Manzanal¹ Antonio Murcia Asensio², Juan Alfonso Gómez Herrero³

¹Hospital General Universitario Santa Lucía, Cartagena, ²Hospital General Universitario Reina Sofía, Murcia, ³Instituto Biomecánica de Valencia

Introduction: reverse oblique intertrochanteric fractures (ROIF) are still a challenge for the orthopaedic surgeon, due to the difficulties associated to fracture reduction and by its peculiar biomechanical characteristics.

Objectives: to provide information about a new implant for the treatment of hip fractures, with especial indication in ROIF.

Methods: the main characteristics of the nail are: the nail crosses through the neck screw contrary to the conventional nails; the cephalomedullary nail has a wide-angle variation; the specific instrumentation allows the surgeon for the reduction of the fracture. A biomechanical study is shown in an anatomic model with the nail inserted in a femoral sawbone simulating a ROIF by applying cyclic load in the lab.

Results: the laboratory study has shown good biomechanical resistance of the cephalomedullary nail comparable with standard trochanteric nails, with ability to maintain the fracture reduced in the anatomical model.

Conclusions: although it is an experimental model, this new cephalomedullary nail may improve the fracture reduction in the subtype ROIF.

TRABECULAR TITANIUM ACETABULAR CUPS FOR REVISION SURGERIES IN COMPLEX ACETABULAR DEFECTS

Francisco Jara García, Lorenzo Hernández Ferrando, José Diranzo García, Vicente Estrems Díaz, Cristina Sánchez Losilla, Antonio Bru Pomer

Hospital General de Valencia

Introduction: Hip prosthetic revision surgery is a surgical challenge, even more when complex acetabular defects appear. Because of a deficit in bone reserve, primary fixation and posterior integration of the acetabular revision implants are difficulted, conditioning the appearance of complications such as instability and loosening, both septic and aseptic. Trabecular titanium implants try to solve these problems.

Objectives: To evaluate our mid-term outcomes in acetabular revision surgery in patients with Paprosky IIIA and IIIB acetabular defects in which trabecular titanium cups were used.

Material and method: We present a retrospective observational study with a sample of 28 patients with Paprosky IIIA acetabular defects (15 patients) and Paprosky IIIB acetabular defects (13 patients) in which acetabular component replacement was performed by trabecular titanium cups between 2011 and 2018. In 9 cases structural allograft was used. In 3 cases, reconstruction plates were required. The mean follow-up was 48 months.

We compared pre- and postoperative variables in terms of pain according to the Visual Analogue scale, functionality measured with the Merle D'Aubigne-Postel score, radiographic results and incidence of complications.

Results: We obtained an average score of 13 points in the Merlé D'Aubigne-Postel score, with good or excellent results in 46% of patients. We have obtained an improvement in terms of pain in all patients, with an average improvement of 5.5 points in VAS. 50% of the patients were able to walk without assistance at the end of the study. In 2 cases (6%) we found acetabular displacement, having replaced one of them for another trabecular titanium revision acetabular cup. In 3 patients superficial infections of the surgical wound occurred, being treated with antibiotics without any subsequent complications. In all the revisions we used double mobility implants with an incidence of 2 dislocations (6%).

Conclusions: The trabecular titanium acetabular cup is a reliable treatment option for complex acetabular defects in prosthetic revision surgery due to its good fixation; obtaining good functional and radiological results in the mid-term in such complex surg

ASSESSMENT OF GLOBAL TRIGGER TOOL TO DETECT ADVERSE EVENTS IN HOSPITALIZED PATIENTS WITH HIP FRACTURE

Francisco José Martín Somoza¹, Lucía Sánchez Cózar², Teresa Ros Ample³

¹Hospital General Universitario de Albacete, ²Hospital General de Villarobledo, Albacete, ³Hospital Universitario La Fe, Valencia

Introduction: There are no many published trials which have examined the Global Trigger Tool To Detect Adverse Events (AE) in patients with hip fracture. The purpose of this study was to compare and analyze a group of specific triggers and the addition of "clopidogrel" as a new trigger tool in order to detect adverse events in this type of patients.

Material and methods: An observational retrospective study was carried out of patients over 65 years who were treated of hip fracture during 2013. Once Global Trigger Tools were defined, patients were classified into two groups according to the presence or absence of any of them: positive trigger and negative trigger. Secondly, the type and number of AE of each group were collected. Statistic Parameters as sensitivity (S), specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) of each trigger tool and of all together were calculated.

Results: 295 patients were included in the study, 211 (71.52%) patients did not have any trigger and 84 (28.48%) had 1 trigger at least. Nosocomial infection (34.52%) and clopidogrel use (32.14%) were the most frequent triggers. The whole of triggers obtained: S 78.1% (CI95% 68.9-85.2), SP 94.1% (CI95% 90.0-96.6), and VPP 86.2%

(IC95% 77.4-91.9). Excluding clopidogrel of group analysis, S decreased up to 67.7% (CI95% 57.8-76.2), E increased up to 96.1% (CI95% 92.5-98.0) and VPP up to 89.0% (CI95% 79.8-94.3). If each trigger tool was analyzed separately, the clopidogrel use (VPP=77.8%, S=21.9%, E=97.1%) and readmission within 30 days (VPP=86.2%, S=26%, E=98%) showed quite similar results that the rest of analyzed triggers.

Conclusion: Global Trigger Tool has proved to be a valid and accurate tool in order to detect AE in patients treated of a hip fracture. The whole selected triggers, including the clopidogrel novel contribution, could be a useful tool for this purpose in this type of patients.

ANTERO SUPERIOR ILIAC SPINE AVULSION

Guillermo Montesa Pino

Hospital Regional Universitario Málaga

Background: Sports injuries in the pediatric population are increasingly their frequency due to the earlier beginning in sports competitions and greater intensity and demand.

The avulsion of the anterior superior iliac spine (ASIS) is an unusual lesion that appears more frequently in sports involving acceleration and sudden hip flexion such as soccer.

Method: A 13-year-old patient, performing a continuous race, after tripping, started with sudden pain in the right groin region. His symptoms were limp, pain, which increased with flexion against hip resistance and active extension of the hip. In the simple pelvic radiography, a displaced ASIS avulsion was observed.

Results: After spending 4 days in discharge, he started with partial weight bearing with crutches for 4 weeks. On the eighth week, he began to walk without crutches and to perform active physiotherapy, going back to his activity in 10 weeks without any pain.

Conclusions: Due to the low incidence of avulsion fractures of ASIS, it requires to be highly vigilant, especially for groin pain of adolescent athletes.

Treatment is usually conservative

OUTCOMES OF THE SLR-PLUS STEM IN REVISION TOTAL HIP ARTHROPLASTY

Iker Uriarte Llano¹, Jesús Moreta Suárez¹, Laura Cortés Muriel², Lucía Bernuy Bajo¹, José Luis Martínez De Los Mozos¹

¹Hospital Galdakao-Usansolo, Galdakao, ²Hospital San-Eloy, Barakaldo

Background: Revision total hip arthroplasty (THA) remains challenging for orthopedic surgeons. Our objective was to assess outcomes with the cementless tapered SLR-Plus stem in revision THA.

Methods: 65 patients (66 hips) that had undergone revision THA with the SLR-Plus stem between 2008 and 2015 at two medical institutions with a minimum 2-year follow-up were reviewed. The mean age at revision surgery was 70.5 years (range, 46-88). Aseptic loosening (57.6%) and infection (31.8%) were the main indications for surgery. There were 38% type I, 47% type II, 12% type IIIA and 3% type IIIB femoral defects according to Paprosky classification. The mean follow-up was 4.1 years (range, 2-8.6). Clinical and radiographic outcomes, survivorship and complications were assessed.

Results: The mean Harris Hip Score improved from 50.4 (range, 11-96) preoperatively to 83 (range, 51-100) at last follow-up ($p<0.001$) and mean Merlé D'Aubigné score improved from 9.5 (range, 2-17) to 14.3 (range, 9-18) ($p<0.001$). 98.4% of stems showed radiographically stable fixation. No aseptic loosening of the stem was seen. Radiolucent lines >1 mm were observed in 33.3% of stems, but did not affect clinical outcomes or implant fixation. Three stems were re-revised (4.5%). The two stems implanted in Paprosky type IIIB defects subsided and one required to be exchanged. At 7 years, estimated stem survival was 95.5% for revision for any reason and 100% for revision for aseptic loosening. Complications included dislocation in 7.6% of hips and deep periprosthetic infection in 6%.

Conclusion: We have shown that SLR-Plus stems provide reliable fixation in Paprosky I-III A femoral defects, leading to excellent survivorship and good clinical outcomes at medium-term follow-up.

RAPID RECOVERY PROGRAM IN NON-CEMENTED PRIMARY TOTAL HIP ARTHROPLASTY

Javier Sanz Reig, Jesus Mas Martinez, David Bustamante Suarez De Puga, Manuel Morales Santos, Enrique Martinez Gimenez, Carmen Verdu Roman

Clinica HLA Vistahermosa, Alicante

Purpose: The purpose of this study was to determine the outcomes of a rapid recovery program in non-cemented primary total hip arthroplasty.

Methods: Prospective study of patients underwent total hip arthroplasty between July 2018 and December 2018 who all participated in a rapid recovery program. Demographic data, number of comorbidities, Charlson

index, ASA grade, preoperative medication for pain, VAS, date and time for surgery, date and time for sitting and walking after surgery, complications, morphine consumption, length of stay, degree of satisfaction with the program, and 30-day readmission rates, were recorded. Patient-reported outcomes were collected at 90-day after surgery using Harris Hip Score, Merle d'Augbiné-Postel, SF-12, Womac, HOS-ADL, and IHOT-12.

Results: Eighty-four patients with a mean age of 64.7 years were included in the study. There were 51 men and 33 women. Mean number of comorbidities was 0.5, and mean Charlson index was 2.3. ASA grade was predominantly grade II in 57.1%.

Mean VAS scale was 4.2 the day of surgery, 3.8 in day 1 after surgery, and 2.9 in day 2 after surgery.

All patients sat in the chair the same day of surgery. Of them 37 patients walked the same day of surgery, 43 within day 1 after surgery, and 4 within day 2 after surgery. The reasons for not being able to walk the same day of surgery were nausea and vomiting in 18 patients, leg motor weakness in 16 patients, and uncontrollable pain in 13 patients.

Ten patients needed to take morphine for pain control during hospitalization.

Mean length of stay was 1.9 days. Thirteen patients were discharged on day 1 after surgery, 63 on day 2 after surgery, 5 on day 3 after surgery, 2 on day 4 after surgery, and 1 on day 8 after surgery.

Mean degree of satisfaction with the rapid recovery program was 8.8.

After discharge, 9 patients returned to emergency department within 30-day after surgery.

All clinical scores improved from the preoperative baseline scores at 90-day after surgery.

Conclusions: Rapid recovery program in non-cemented total hip arthroplasty can be performed safely and effectively. Length of stay was short with encouraging outcomes at 90-day follow-up.

Our rapid recovery program needs to improve to reduce the rate of nausea and vomiting, morphine consumption, and visits to emergency department after discharge.

ARTHROSCOPIC TREATMENT IN PATIENTS AGED 30 OR YOUNGER: INTRAOPERATIVE FINDINGS AND MID-TERM OUTCOMES

Javier Sanz-Reig, Jesus Mas Martinez, Carmen Verdu Roman, Enrique Martinez Gimenez, Manuel Morales Santias, David Bustamante Suarez De Puga

Clinica HLA Vistahermosa, Alicante

Purpose: The purpose of this study was to evaluate hip arthroscopic intraoperative findings and mid-term outcomes of a series of patients aged 30 years or younger who underwent hip arthroscopy for femoroacetabular impingement.

Methods: Retrospective study of a prospective hip arthroscopy database in patients who underwent hip arthroscopy for femoroacetabular impingement between January 2012 and December 2018. Inclusion criteria were aged between 18 and 30 years old, articular space greater than 2 mm, lateral center edge angle between 25° and 40°, Tönnis grade 0-1, minimum follow-up 2 years.

Demographic information, sports activity level, time for symptoms, intraoperative findings, surgical technique, four patient-reported outcome, and radiographic evaluation was collected.

Results: Thirty-nine patients (46 hips) with a mean age of 24.1 years were included in the study. There were 30 men and 9 women. Mean time for symptoms was 16.7 months. Tegner activity scale was equal or greater than 7 in 76.9%. Labrum morphology was normal in 35 hips (76.1%), hypoplastic in 9 (19.6%), and hyperplastic in 2 (4.3%). Labrum tear was detected in 34 hips (73.9%), and degenerative labrum in 3 hips (6.5%). Acetabular chondral rim lesions were detected in 37 hips (80.4%), being in 4 hips full thickness chondral lesions. Six hips (13%) associated iliopsoas impingement.

Mean follow-up was 50.2 months. All scores improved significantly from the preoperative baseline scores.

Conclusions: Young patients with high sports activity scale show a high percentage of labrum and acetabular chondral rim lesions. Hip arthroscopy allows to detect intra-articular lesions, resect bone deformities, repair labrum and chondral lesions, and obtain a good mid-term results.

VITAMIN D SUPPLEMENTS ON DISCHARGE AFTER HIP FRACTURE. IS A PROTECTIVE FACTOR AGAINST SECOND OSTEOPOROTIC FRACTURE?

Jesús Jiménez Olivares¹, Francisco Lajara Marco², María Del Carmen González Jara¹, Eva María Veracruz Gálvez¹, Elena Blay Domínguez¹, Juan Antonio Lozano Requena¹

¹Hospital Vega Baja, Alicante, ²Hospital General Reina Sofía, Murcia

Introduction: The mechanisms for detecting vitamin D deficiency on admission, the administration of the vitamin D supplements, and the optimization of calcium intake are aimed at reducing the risk of new fractures due to fragility or refracture. The objective of this study

is to analyse if treatment with vitamin D supplements on discharge, reduces the risk of second osteoporotic fracture, in patients treated in our centre for hip fracture with vitamin D deficiency on admission (Vit D <30 ng/ml).

Material and methodology: A total of 207 patients were retrospectively reviewed, older than 65 years, with vitamin D deficiency on admission, treated for hip fracture in our centre between April 2015 and October 2018. They were divided into two groups based on their treatment with vitamin D on discharge. They were analysed under explanatory variables: age, sex, Barthel Index and fracture type and as outcome variable, the rate of second fractures after a minimum follow-up of 6 months. The protection capacity of treatment with vitamin D on discharge was analysed through Relative Risk (RR). To evaluate the discrimination capacity of the values of vitamin D on admission, the area under the ROC curve was measured for the appearance of second fractures.

Results: Six osteoporotic fractures were recorded in 207 patients (2.8%). All the new fractures occurred in patients older than 80 years with lymphopenia. Four of the six new fractures occurred after subcapital fractures. In terms of group distribution, four (3.2%) were recorded in the group with treatment with vitamin D supplements on discharge (Group A: N=125), and two (2.4%) in the group that did not receive treatment (Group B: N=82). The RR of suffering a second osteoporotic fracture was 1.3 in Group A. The area under the corresponding ROC curve, of the values of vitamin D on admission, was 0.472 for the appearance of new osteoporotic fractures.

Conclusions: We did not detect protection capacity through treatment with vitamin D supplements on discharge against second osteoporotic fractures. And vitamin D on admission does not have an acceptable discrimination capacity for the appearance of new osteoporotic fractures in patients with hip fracture in our environment.

TOTAL HIP ARTHROPLASTY WITH SHORT STEMS IN PATIENTS WITH FEMORAL DIAPHYSEAL DEFORMITY

Jesús Moreta Suárez¹, Xabier Foruria Zarandona¹, Iker Uriarte Llano¹, Daniel Donaire Hoyas², José Manuel Fernández Carreira³, Manuel Sumillera García⁴

¹Hospital de Galdakao-Usansolo, Galdakao, ²Hospital de Poniente, Almería, ³Hospital de Jarrío, Coaña, ⁴Hospital Universitario Marqués de Valdecilla, Santander

Introduction: Hip osteoarthritis in patients with femoral diaphyseal deformity (FDD) may be secondary to skeletal dysplasias, previous trauma or osteotomies and total hip arthroplasty is a challenge in these cases. Corrective osteotomies, hip resurfacing or customized implants can treat patients with FDD but these techniques have other risks

and limitations. Short stems are an alternative in these cases. The purpose of this study is to assess the clinical and radiological results of a short stem design and a comparison with patients without femoral deformity.

Material and methods: Prospective study of patients with FDD treated with the Furlong Evolution stem (JRI Ltd., London, UK) with a minimum follow-up of 1 year. Diaphyseal deformity was defined as an anatomical variation (posttraumatic, dysplasia or other conditions) that would require a special implant or osteotomy. In total, data were collected on 9 patients with deformity (7 cases with flexion deformity and 2 cases in extension). Causes of the deformity were previous osteotomy for treatment of Perthes disease in 4 cases, malunion of previous fracture in 3 cases and previous osteotomy for dysplasia in 2 cases. The control group consisted of 157 patients being comparable in terms of age, sex and BMI. Clinical results were evaluated with the WOMAC scale and the Harris Hip Score (HHS) preoperatively, at 1 month, 3 months, 1 year and then every 2 years. The fixation of the implant was evaluated with the radiological criteria of Engh.

Results: At a mean follow-up time of 43.8 months (range, 13-71), significant improvement in HHS values was obtained in both groups. This improvement was slightly greater, although these differences were not statistically significant, in the group of patients with deformity (mean preoperative from 44.2 to 94 postoperatively) compared to the control group (mean of 47.6 to 91.9). With the WOMAC scale, an improvement was also observed in both groups, with a greater improvement in the stiffness section for the deformity group than for the controls ($p = 0.003$). In the two groups, there was no intraoperative complication related to the femoral stem or dislocation and no aseptic loosening was identified. In the control group, 2 cases of superficial infection and 3 cases of deep infection were collected.

Conclusions: This short stem design is a good option in patients with FDD, with similar results to patients without deformity.

LEVEL AND SPORTS ACTIVITY IN PATIENTS YOUNGER THAN 50 YEARS UNDERGOING TOTAL HIP ARTHROPLASTY

Jorge Gómez Álvarez, Jesús Payo Ollero, Roberto Alcalde Susi, Andrés Valentí Azcárate, Juan Ramón Valentí Nin, José María Lamo De Espinosa Vázquez De Sola

Clinica Universidad de Navarra, Pamplona

Objectives: To assess the level and type of sports activity of patients under 50 years of age who underwent total hip arthroplasty (THA) and to assess the recommendations given by physicians regarding sports practice.

Materials and methods: We performed a descriptive study that analyzes 46 patients (33 male and 13 female) under 50 years of age who underwent THA (58 hips) in our center between 2004 and 2010. Age, sex, sports activity according to the UCLA scale, sports activities practiced before and after the procedure, complications and recommendations given by doctors were evaluated.

Results: The average age and follow-up was 41 (37-48) years and 7.5 (1-11) years, respectively. The average time to resume sport activity after the surgery was 5 (3-10) months. There were no differences in the UCLA scale before and after the operation ($P > 0.05$). The most practiced sports before the surgery were swimming and contact sports (17% each one). Contact sports decreased to 1.25%. About medical advice, 31% of patients did not receive advice from their physician and the 65.2% were dissuaded from playing sports after THA. In cases which medical advice have been given, the recommended sports were swimming (44%) and the stationary bicycle (17.5%), correlating with the sports most practiced by the patients after the intervention. Contact and impact sports were discouraged by 68%. In three cases, the high molecular weight polyethylene had to be replaced.

Conclusion: The patients modified their sport activity after total hip arthroplasty. The THA procedure and the doctor's advice influenced the sports activity performed after surgical procedure. The number of complications does not seem to increase in those patients who perform well known contact sports, although the percentage of patients who perform them after the intervention is small. It is required to study each case individually to adapt the sport activity.

ONE TO TWELVE YEARS OF DIRECT ANTERIOR APPROACH IN TOTAL HIP PROSTHESIS: 844 CASES WITH GOOD

Joan Ferràs Tarragó, Pablo Jordà Gómez, Nadia Jover Jorge, Ismael Escriba Urios, Jorge Castro Gil, Jose Aracil Silvestre

Hospital La Fe, Valencia

Objectives: To evaluate the implant survival in total hip arthroplasty by direct anterior approach with intraoperative fluoroscopy, femoral lifting hook and conventional table in 844 cases over 12 years of evolution.

Material and methods: A retrospective, multicenter cohort study with prospective collection in where implant survival for total hip arthroplasties implanted by direct anterior approach using the Kaplan-Meier curve was analyzed, with 844 interventions in 6 independent centers. As secondary results, the incidence of aseptic loosening of the components, spare parts, type of cementation, type of

stem, type of insert, etiology and hospital where the intervention was performed were evaluated.

Results: The overall implant survival rate was 98.5%, with a total of 12 replacements (1.5%), of which 0.4% were due to infection ($n = 4$), 0.3% to loosening of the femoral stem ($n = 3$), 0.3% to malposition of the cup (0.3%) and 0.2% to the breakage of the ceramic insert ($n = 2$). Reinterventions without replacement of the material were due to infection of the surgical wound (0.36% $n = 3$), fracture of the greater trochanter with discomfort due to the spicule (0.24% $n = 2$) and psoas tenotomy due to friction (0, 47% $n = 4$).

No differences were observed between age, sex, cementation, type of stem, etiology, insert or hospital where the surgery was performed ($p > 0.05$)

Comments and Conclusions: Unlike results from recently published studies, the direct anterior approach does not represent a risk factor for implant survival. An important factor to be considered is the correct femoral exposure, and its neglect may explain the results shown by other series that show a greater risk of loosening. Studies that compare the previous direct route with other approaches in order to analyze the survival of the implant are necessary, but according to our data, the direct anterior route is not risk factor for survival per se, since it is a safe and useful route for total hip arthroplasties.

HOW, WHEN AND WHY WE PERFORM BILATERAL NON-CEMENTED HIP ARTHROPLASTY IN A SINGLE TIME

Jorge Gómez Álvarez, Santiago Troncoso Recio, Jesús Payo Ollero, Andrés Valentí Azcárate, Juan Ramón Valentí Nin, José María Lamo De Espinosa Vázquez De Sola

Clínica Universidad de Navarra, Pamplona

Objectives: To describe the clinical and radiological follow up results of the patients involved in bilateral non-cemented hip arthroplasty in a single time and to define the tips to do it securely.

Materials and Methods: We have retrospectively reviewed the patients treated between 2000 and 2015 in our center by bilateral uncemented total hip replacement in a single time. We have reviewed the medical history and analyzed by age, diagnosis and ASA parameters related to the procedure, hospital stay, transfusion requirements and clinical complications. Radiological evaluation was made with anteroposterior hip radiograph evaluation (acetabular radiolucencies and stem migration). Functional assessment was carried out by the Merle D'Aubigne' score. All the procedures were done by anterolateral approach in supine decubitus.

Results: Eighteen patients with an average age of 47.2 years (18-68) and a follow-up of 92.3 (26-220) months have been assessed. ASA distribution was: 33.4% grade I, 50% grade II and 16.6% grade III. The functional score of Merle D'Aubigne improved 5.92 points (10.6 to 16.5). All the patients required two hemoglobin concentrates transfusion at least and the average hospital stay was 6 days. We report two external popliteal sciatic nerve neuropraxia with complete recovery. One case of aseptic mobilization. No episodes of prosthetic infection were described.

Conclusion: Non-cemented bilateral THA in a single time is a safe procedure, with low rates of complications in the immediate postoperative period and is correlated with a faster recovery of the patient.

It is important to do an adequate selection of the patient, to use different fields and equipment for each hip and consider that patient may require transfusion of hematic concentrates. The use of tranexamic acid could change this last paradigm.

INSTABILITY HIGH RISK OF DISLOCATION IN TOTAL HIP ARTHROPLASTY: THE DOUBLE MOBILITY CUP VALUE

Jorge Gómez Álvarez¹, Victoria Moreno Figaredo¹, Andrés Valentí Azcárate¹, Pablo Díaz De Rada Llorente², Juan Ramón Valentí Nin¹, José María Lamo De Espinosa Vázquez De Sola¹

Clínica Universidad de Navarra

Objectives: To study the effectiveness of the double mobility cup in the prevention of dislocation of total hip arthroplasty in patients with a high risk of instability

Materials and Methods: We have retrospectively reviewed patients with at least two risk factors for hip instability who underwent total hip arthroplasty with cemented double mobility cup between March 2009 and March 2018. We have included only patients with High instability risk in primary total hip arthroplasty, revision cup surgeries and those secondary to fracture. In all the cases the same surgical approach was performed with a Watson Jones modified approach in supine position.

We have collected demographic data, instability risk factors. Patients were classified according their activity level using the Devane's score. Surgical and follow-up complications were collected from medical history following the risk factors for instability. In all patients, an anterolateral approach was performed in the supine position.

Results: One hundred and twenty five hips in 119 patients have been included in the study. De los cuales

tenemos seguimiento de más de 1 mes en 121 caderas de 115 pacientes. The median age of the patients was 80.3 years (range from 53 to 105 years) and the ASA showed a distribution: grade II 28 %, grade III 80 % and grade IV 8 %. 53 cases are primary total hip arthroplasties; 39 total hip arthroplasties secondary a hip fracture and 29 cases of revision arthroplasties. Devane's score was less than 4 in all of the cases. At least two patient-dependent risk factor for instability (in 88,1% three or more) were present in each case. Median follow-up time was 35.486 months (range 2-106 months). Complications observed were one case of dislocation of prosthesis, two cases of infection and two cases of aseptic loosening, one aseptic loosening at 15 months which required revision surgery and one in a cup-cage construction at 20 months which required only a new cup component.

We have retrospectively evaluate 125 hip arthroplasties in 119 patients. We excluded 4 due to lost follow-up. Finally, 121 arthroplasties (115 patients) were included in the study. The average age was 80.3 (53-105) years. Fifty three were total primary hip arthroplasties, 39 secondary to hip fracture and 29 revision arthroplasties. The ASA distribution was: 28% grade II, 80% grade III and 8% grade IV. The Devane index was less than 4 in all cases. All patients had two risk factors for dislocation at least (88.1% three or more). The mean time of follow-up was 35.5 months (6-106 months). The complications observed were one case of dislocation (conversion in resection arthroplasty), two cases of infection and two cases of aseptic loosening: one at 15 months of follow up resolved with a revision surgery and the other was a loss of cementation of a Cup-Cage system.

Conclusion: Dual mobility cup represents an excellent surgical option to prevent dislocation in high risk primary total hip arthroplasty instability and those secondary to fracture and revision surgery.

AUTOTRANSFUSION DRAINAGE IN PRIMARY TOTAL HIP ARTHROPLASTY: RANDOMIZED PROSPECTIVE STUDY

Jorge Gómez Álvarez, Jesús Payo Ollero, Fernando Picón Serrano, Andrés Valentí Azcárate, Juan Ramón Valentí Nin, José María Lamo De Espinosa Vázquez De Sola

Clínica Universidad de Navarra, Pamplona

Objectives: To objectify the effect of drainages use in the immediate postoperative period of the patients who underwent of total hip arthroplasty.

Materials and Methods: Prospective randomized study of 100 patients treated by primary hip arthroplasty due to osteoarthritis. Fifty of them were allocated to drainage

group and 50 to non-drainaged group. We collected different clinical and analytical parameters, making a statistical comparison between the two groups.

Results: We did not find differences between the groups in age, sex and comorbidities with the exception of the greater proportion of patients taking acetylsalicylic acid (100 mg) in the non- drainage group ($p < 0.05$). The proportion of cemented arthroplasty was higher in the drainage group (36% vs 16%) although most of the total hip arthroplasties in both groups were uncemented. Patients in drainage group had a mean hospital stay of 6 vs 4 days postoperatively in non drainage group ($p = 0.01$) and received a higher blood transfusions ($p = 0.04$). There were no differences in wound exudate ($p > 0.05$) as in the decrease of hemoglobin levels.

Conclusion: Patients without drainage did not present greater immediate postoperative complications. No drainage was associated with a lower number of transfusions and hospital stay.

ANTERIOR ACETABULAR FRACTURES: BEYOND THE ILIOINGUINAL APPROACH

PRESENTATION OF 31 CASES TREATED BY MINIMALLY INVASIVE APPROACHES

Diranzo-García J, Hernandez-Ferrando L, Estrems-Díaz V, Castillo-Ruipérez L, Zarzuela-Sánchez V, Bru-Pomer A.

Unidad de Cadera y Pelvis. Hospital General Universitario de Valencia

Objective: To evaluate clinical and radiological results and incidence of complications of surgical treatment of a series of patients with acetabular fracture, surgically treated through minimally invasive approaches (traditionally treated by an ilioinguinal approach).

Material and methods: Retrospective and descriptive analysis of 31 acetabular fractures surgically treated using minimally invasive approaches, associating an anterior approach (Modified Stoppa or Phannestiel approach) to the lateral window of the ilioinguinal approach. 23 men and 8 women with an average age of 49 years. We classify the fractures according to Judet and Letournel. We evaluated the quality of the postoperative reduction according to the Matta criteria, the progression to coxarthrosis according to Tönnis and the clinical results according to the Merle D'Aubigné score.

Results: The average surgical time was 168 minutes. An anatomical reduction of the lesion was obtained in 20 cases, imperfect in 8 and poor in 3. In 5 patients there was a progression of the degree of coxarthrosis and none required prosthetic replacement. The average score in the

Merle D'Aubigné score was 16.1 / 18 points, with good to excellent results in 19 cases. As complications, one case of superior gluteal injury, one of bladder rupture, one of infection of the surgical wound and one case of transient obturator nerve neuroapraxia were observed.

Comments and Conclusions: Using minimally invasive techniques we can obtain an anatomical reduction of acetabular fractures and good functional results. However, these minimally invasive approaches are technically very demanding and are not free of complications. Despite this, they are nowadays the choice of our group to treat anterior acetabular fractures.

BONE REMODELLING OF TWO ANATOMIC STEMS. DENSITOMETRIC STUDY OF THE REDESIGN OF THE ABG-II STEM

Juan J. Panisello, Jorge Lopez, Marina Lillo, Jesus Mateo, Carlos Martin, Antonio Herrera

Adult Hip Unit. Orthopaedic Surgery Department. Miguel Servet University Hospital

Background: Periprosthetic bone remodeling is a multifactorial phenomenon observed in all femoral stems, and has a multifactorial origin as it depends on factors related to the patient, the surgical technique and the design of the implant. In order to determine the pattern of remodeling produced by two models of anatomic cementless implants, we quantified the changes in BMD in the 7 areas of Gruen observed in different moments after surgery during the first postoperative year.

Methods: A prospective, comparative, controlled, one-year follow-up densitometric study was carried out in two groups of patients suffering from primary unilateral hip osteoarthritis. In the first group, with 68 patients, an ABG-II stem was implanted. In the second, with 66 patients, the ANATO stem was used. The contralateral, healthy hip was taken as control.

Results: Both groups showed a decrease in BMD at 3 months in all the areas, which recovered at the end of the study, except in zones 1 and 7 in group ABG-II, with losses of 6.1% and 17.7% respectively; and of 5.9% only in zone 7 in the group ANATO. In zones 2 and 6, where more loads are transmitted, conservation of BMD is observed in response to Wolff's law. The differences in the pattern of remodeling between groups were maintained despite the age, gender, BMI of the patients or size of the implants.

Conclusion: The ANATO stem achieved a more efficient transmission of loads at the metaphyseal level than the

ABG-II stem, which promotes bone preservation at the proximal femur.

Key words: Hip, total arthroplasty, bone densitometry, periprosthetic remodeling.

CLINICAL AND RADIOLOGICAL FACTORS RELATED TO DISLOCATION IN PATIENTS UNDERGOING HIP HEMIARTHROPLASTY FOR FEMORAL NECK FRACTURES: A CASE-CONTROL STUDY

Lorena Bellostas Muñoz, Israel Rubio Saez, Ricardo Fernández Fernández, Eduardo García Rey, Javier Gómez Luque, Natalia González Ruiz, Enrique Gil Garay

Hospital Universitario La Paz. Madrid

Introduction: Hip hemiarthroplasty is the treatment of choice for the management of displaced femoral neck fractures in the elderly and low demand patients. Dislocation is a rare complication but it is associated with high mortality rates and morbidity.

Aim: To evaluate clinical and radiological parameters related to hip hemiarthroplasty dislocation after surgery for femoral neck fractures.

Materials and Methods: A retrospective case-control study was designed. 22 patients who sustained a dislocation between 2009 and 2017 (cases) were matched to 50 patients who underwent hip hemiarthroplasty in 2018 (controls). Demographic and clinical factors were recorded including neurological disorders, comorbidities, delay to surgery, Barthel's index and previous functional capacities. Measurements of acetabular parameters (Centre edge angle of Wiberg and acetabular index) and femoral (offset and residual femoral neck) were done. An adjustment of the radiological magnification was made based on the size of the femoral head.

Results: A lower Barthel index was associated with the appearance of dislocation: 71.7 versus 90 ($p = 0.039$). Delay to surgery was greater in the cases than in the controls, with 8.8 days on average versus 3 days ($p < 0.001$). No differences were observed for the size of the femoral head or the use of a monopolar or bipolar implant. Significant differences were observed in the cases with an increased femoral offset, 43.9 mm versus 33 mm ($p = 0.018$) and a shorter residual femoral neck, 23.5 mm versus 30.4 mm ($p = 0.018$). With the number of hips available, no differences were observed in the acetabular index ($p = 0.48$) or in the Wiberg angle ($p = 0.056$).

Conclusions: Although this study can be considered preliminary, previous functional patient's status, femoral offset

and a shorter residual femoral neck may be associated to dislocation in patients undergoing hip hemiarthroplasty after femoral neck fractures. Further studies are needed to make definite conclusions.

INTERNAL FIXATION OF A PERIPROSTHETIC PERTROCHANTERIC HIP FRACTURE, BELOW RESURFACING PROSTHESIS

Lucía Lanuza Lagunilla, David Alonso Álvarez

Cabueñes University Hospital, Gijón

Goals: A 74-year-old fit, healthy, and active man, was transferred to the emergency room with painful in the left leg and inability to weight bear after a bicycle fall.

Material and methods: On clinical examination, his left leg was neurovascularly intact and clinically shortened with evidence of external rotation. Of note there was a history of previous bilateral hip resurfacing for painful osteoarthritis with the left side 10 years prior to admission and the right side 8 years before. Radiographs demonstrated an intertrochanteric fracture of the proximal aspect of the left femur below resurfacing prosthesis, and fracture of left pelvic branches. The Hip Resurfacing implant was in a good position, was well-fixed, and had no evidence of loosening.

Results: The therapeutic options were discussed with the patient, and we decided to attempt internal fixation and osteosynthesis for preservation of bone stock, and avoiding a much more extensive revision total hip replacement procedure. In the operating room, the patient was placed on a traction table and closed reduction was achieved under image intensifier guidance. Through a percutaneous approach, fracture is synthesized with a percutaneous compression plate (P.C.C.P. Gotfried-Orthofix) with two proximal screws avoiding the stem of the resurfacing prosthesis. Postoperatively he had no complications and is discharged at 5 days. He was able to mobilize with partial weight-bearing at 24 hours after surgery for his pelvic fracture. At the 4-week follow-up, the patient was able to bear weight fully with no use of walking aids. At the 5-month follow-up, the patient had pain-free function, had full range of hip movements, and had returned to his previous active lifestyle. Radiographs demonstrated good alignment with no collapse or fracture displacement.

Comments and Conclusions: Extracapsular fractures are the most common after a traumatic event with a hip resurfacing in situ. Factors to consider when deciding on the best treatment option include fracture configuration, functional status, age, comorbidities, bone quality and likelihood of requiring later revision surgery. For this case, conservative management was not considered. Although

the usual tendency is the realization of a prosthetic replacement, previous reports have shown successful treatment with retention of a well-functional implant. There is little literature available on internal plate fixation of these fractures, we recommend considering this treatment in these situations.

OSTEOSYNTHESIS OF PERIIMPLANT SUBTROCHANTERIC COMPLEX FRACTURE

Lucía Lanuza Lagunilla, Alfonso Sánchez-Mayoral Posada, David Alonso Álvarez

Cabueñes University Hospital, Gijón

Goals: A 92-year-old woman was transferred to the emergency room with painful in her left leg after falling out of bed.

Material and methods: On clinical examination, her left leg was neurovascularly intact and clinically shortened with evidence of deformation at the thigh. Of note, there was a history of cognitive impairment, dependence for basic activities of daily life, performs life chair bed, diabetic, previous bilateral total knee arthroplasty, partial right hip prosthesis and retrograde femoral nail after periprosthetic fracture of the left knee 8 years ago. Radiographs demonstrated a subtrochanteric shaft extended perinail fracture, of left femur. The hip and knee arthroplasty implants were in a good position, were well-fixed, and had no evidence of loosening.

Results: Skin traction was temporarily used until surgery. In the operating room, the patient was placed on a traction table. Through a lateral approach the proximal femur was exposed. A DCS plate (Synthes) with a combination of ten cortical screws (five distal ones passing avoiding the nail) and four cerclage wires were used to synthesized the fracture. Postoperatively she had no complications; she was able to bear weight fully with walking aids and is discharged at 7 days.

Comments and Conclusions: The success of prosthetic surgery has led to an increase in the percentage of the population having more than one prosthetic implant. This, combined with an increase in the average life expectancy and functional requirements for the elderly, has led to a higher incidence of periprosthetic and interprosthetic fractures. When dealing with this fractures, one of the problems is that there is little literature available, with absence of classification systems, and specific and validated treatment algorithms. The systems traditionally used for periprosthetic hip or knee fractures, do not take into account the presence of another implant in the same femur, condition that modifies its baseline characteristics and places us in a new scenario. Their treatment is not only

technically demanding and challenging, but can also be associated with serious complications. Treatment must be determined and assessed according to the type of fracture, the stability of the prosthesis, the bone quality and the general condition of the patient.

SECULAR TREND IN THE INCIDENCE OF HIP FRACTURE VERSUS REST OF THE FEMORAL FRACTURES OVER 20 YEARS IN ASTURIAN POPULATION

Lucía Lanuza Lagunilla, Abelardo Suárez Vázquez, Diego Velasco Villa, Pablo Suárez Anta, Álvaro Cambolor Valladares, Antonio Meneses Gutiérrez

Cabueñes University Hospital, Gijón

Goals: To know the incidence and epidemiological characteristics of proximal femoral fractures (PFF) and compare them with the rest of femoral fractures (RFF), over a period of 20 years in the Principality of Asturias (PA).

Material and methods: Ecological, observational and retrospective study. All FFP and RFF were collected from 1996 to 2015 in the MBDS (Minimum Basic Data Set) of Public or Concerted Hospitals of PA Health Service. Data has been provided by its Epidemiology Service within the "DO NOT DO" project managed by the Office of Evaluation of Health Technologies of the PA. Data about age, gender, type of fracture, day and month of hospitalisation were collected.

Results: We identified 28453 femoral fractures in the period. PFF were the most frequent (89%). The crude incidence rate (IR) for PFF increased from 87.8 cases per 100,000 inhabitants per year in 1996, to 172.3 cases in 2015, increasing equally in both sexes; while the crude IR for RFF decreased from 13.9 cases per 100,000 inhabitants per year in 1996, to 11.9 cases in 2015, increasing 1/3 in women and decreasing 50% in men.

The PFF were 2.86 times more frequent in women with equality of sex in RFF ones. The average age increased in both sexes, from 74.5 years to 81.9 in the PFF, and from 47.5 to 60.6 in the RFF throughout the study.

There were no variations in admission to the hospital during the week in the RFF, but in the PFF there is a downward trend during the weekend. An opposite seasonal influence is observed in both fractures, while the PFF were higher in winter, RFF were more frequent in summer.

IR adjusted for age and gender was higher in men in the age groups up to 64 years; and women from 65 years.

Comments and Conclusions: Faced with the decrease in the IR of fractures that, like RFF require greater traumatic violence, PFF continue to increase in the population

studied. Our results justify new research on risk factors and prevention of PFF in our community.

OUR EXPERIENCE WITH THE USE OF FEMORAL NECK SYSTEM (FNS) FOR TREATING FEMORAL NECK FRACTURES: PRELIMINARY RESULTS

María Murcia Gómez, Francisco Ferrero Manzanal, Lázaro Ibáñez Martínez, Belén Níguez Sevilla, Juan Carlos Rivas Garnica, María José Ros Nicolás

Hospital General Universitario Santa Lucía, Cartagena

Introduction and objectives: femoral neck fractures that are suitable for osteosynthesis are a common problem in our speciality. Although cannulated screws remain the gold standard of treatment for this type of fractures, there are other systems like DHS (with or without additional screw) that may have a potential role for high-energy fractures. The FNS is a new orthopaedic device that aims for a higher stability with a minimal incision.

Methods: a comparative study was done between two groups of patients that suffered from femoral neck fracture in our hospital: group A: FNS (5 patients); group B: cannulated screws (5 patients). The analyzed variables were preoperative hemoglobin, surgical length, body mass index, associated diseases, age and complications. Non-parametric tests were employed to compare both groups.

Results: there was no statistically significant difference between both groups for the variables “surgical length”, “body mass index”, “preoperative and postoperative hemoglobin” (Mann-Whitney U, $p > 0,05$). In the group FNS the weight bearing started earlier but the differences were not statistically significant (χ^2 Pearson, $p > 0,05$). There were no complications in the studied patients.

Discussion: femoral neck osteosynthesis still remains a challenge for the orthopaedic surgeon. The biomechanical studies have shown better stability compared to cannulated screws in the literature.

Conclusions: Although the preliminary results seem to be positive, further research is needed with a higher number of patients to draw conclusions about the role of this new implant in the treatment of femoral neck fractures.

IATROGENIC RIB FRACTURES AFTER CEPHALOMEDULLARY NAIL SURGERY FOR TROCHANTERIC FRACTURE: CASE REPORT

María Murcia Gómez, Francisco Ferrero Manzanal, María José Ros Nicolás, Belén Níguez Sevilla, Juan Carlos Rivas Garnica, Marina Hernández Torralba

Hospital General Universitario Santa Lucía, Cartagena

Objectives: to show an uncommon complication in hip fracture surgery as a consequence of the position of the patient in the operating table.

Methods: we present a case of a 76-year-old lady that suffers from trochanteric hip fracture. She undergoes surgery (cephalomedullary nail) in a conventional traction table with lateral support on the ipsilateral hemithorax.

Results: the patient complains of pain and hematoma in the ipsilateral hemithorax the day after the surgery. The x-rays showed fracture of 5th and 6th rib arcs. She receives conservative treatment with painkillers and chest physiotherapy.

Conclusions: rib fracture is a rare complication in hip fracture osteosynthesis. Care must be taken to pad the lateral support in order to minimize the risk of this complication, which may eventually cause respiratory complications in the ancient population impairing the functional recovery of this patients.

EXCHANGE OF PFNA BLADE BY A CEMENT AUGMENTED BLADE WITH PLUGGING OF THE NECK CANAL AFTER CUT THROUGH COMPLICATION: SURGICAL TECHNIQUE

María Murcia Gómez, Francisco Ferrero Manzanal, María José Ros Nicolás, Belén Níguez Sevilla, Lázaro Ibáñez Martínez, Juan Carlos Rivas Garnica

Hospital General Universitario Santa Lucía, Cartagena

Objectives: to show the surgical technique to avoid cement leakage to the hip joint.

Methods: we report a case of a 75-year-old patient with a high cardiovascular risk that presents a cut through complication one month after osteosynthesis of a trochanteric fracture. The surgery consisted on blade removal, plugging of the distal part of the neck tunnel with a modified Stryker universal plug, then a new cement augmented blade under radiological control.

Results: no cement leakage was seen in the postoperative x-ray. After 6 months, the patient has no pain and the fracture is completely healed.

Conclusion: exchanging PFNA blade after mechanical failure like cut through has the inconvenience that it has to be augmented with cement because there is no locking mechanism of the blade. The blade canal has to be sealed in order to avoid leakage of the cement to the hip joint. The sealing with a plastic plug is an option for treating this complication.

DISK HERNIATION THAT MIMICS OSTEOARTHRITIC PAIN: CASE REPORT

María Murcia Gómez, Francisco Ferrero Manzanal, María José Ros Nicolás, Belén Níguez Sevilla, Juan Carlos Rivas Garnica, Lorena Fontao Fernández

Hospital General Universitario Santa Lucía, Cartagena

Objectives: to report a clinical case of a patient with hip osteoarthritis that presents sudden groin pain.

Methods: a clinical case of a 75-year-old man is presented. The patient had had an acetabular fracture in the past with secondary osteoarthritis well tolerated. He complains from sudden groin pain without recent trauma.

Results: the physical exam of the hip was a severe limitation of the mobility with fixed flexion of 20° and maximal flexion of 40° with 3 cm of shortening. No worsening of the pain was observed with the hip rotation manoeuvres. A lumbar magnetic resonance study is performed to discard other causes of the pain. The images showed foraminal herniation L2-L3 that suggested ipsilateral radicular compression. He was treated with medical treatment and a lift to compensate length discrepancy with improvement and pain relief in a few weeks.

Conclusions: sudden groin pain in a patient with hip long-term osteoarthritis with good tolerance has to make us suspect the possibility of irradiated pain from the lumbar spine as a consequence of spine disorders associated with hip osteoarthritis. It is important to do a correct diagnosis in order to avoid unnecessary hip replacement.

FEMORAL NAIL REMOVAL BY RETROGRADE IMPACTION: SURGICAL TECHNIQUE

María Murcia Gómez, Francisco Ferrero Manzanal, María José Ros Nicolás, Lázaro Ibáñez Martínez, Juan Carlos Rivas Garnica, Belén Níguez Sevilla

Hospital General Universitario Santa Lucía, Cartagena

Objectives: to show the uncommon surgical technique of intramedullary nail removal.

Methods: we submit a case of a 62-year-old patient that had been operated of femoral fracture with a Gross-Kempf nail that suffers from a motorbike accident with severe open fractures of ipsilateral tibia and femur with exposure of the distal part of the nail and non-repairable ischemia above the knee. Infracondylar amputation was performed initially as the nail removal kit was not available in emergencies. A few days after supracondylar amputation was performed. To remove the nail the proximal locking screw was removed first and then the nail was impacted in a

retrograde way until it appear in the supratrochanteric area where a small incision was done.

Results: nail removal by this technique was very fast even though the nail was well osseointegrated. The evolution of the patient was very good without complications of the stump. The evolution of the removal wounds was correct.

Conclusions: considering the situation of this patient and the impossibility to place the limp in a traction table, we decide to perform a retrograde impaction, minimizing soft tissues damage and surgical length.

HIDDEN SIMPLE BONE CYST IN A CHILD WITH FEMORAL NECK FRACTURE: OSTEOSYNTHESIS BY CANNULATED SCREWS

María Murcia Gómez, Francisco Ferrero Manzanal, Juan Carlos Rivas Garnica, Belén Níguez Sevilla, María José Ros Nicolás, Lázaro Ibáñez Martínez

Hospital General Universitario Santa Lucía, Cartagena

Introduction and objectives: femoral neck fractures in children are very uncommon. Simple bone cyst is a pseudotumoral lesion typically located in bone metaphyseal area of children and adolescents. The objectives are to report a case of a femoral neck fracture that develops a bone cyst after surgical treatment.

Methods: we present the case of a 7 year-old patient that suffers from a fall with groin pain and inability to walk. The patient is operated in Emergencies. Cannulated screws were used to fix de fracture preserving the physeal area. A coadyuvant hip spica cast was used.

Results: the evolution of the fracture was satisfactory. The screws were removed one year after the fracture. No residual pain remained. In the following x-rays a progressive cystic lesion was seen in the metaphyseal area that was labeled as unicameral bone cyst. As the cortex around the cyst was not thinned, no prophylactic surgery was done. The lesion disappeared after 3 years of follow-up.

Conclusions: femoral neck fractures in children are rare, so we have to be vigilant to the possibility of concomitant bone lesions like in this case that may eventually need prophylactic surgery in order to avoid refracture. A strict follow-up must be done.

IMPACTION GRAFTING IN A SECOND STAGE REVISION SURGERY AFTER THR INFECTION IN A 56 PATIENT

María Murcia Gómez, Francisco Ferrero Manzanal, Juan Carlos Rivas Garnica, María José Ros Nicolás, Belén Níguez Sevilla, Miguel Ángel Sánchez Carrasco

Hospital General Universitario Santa Lucía, Cartagena, Spain

Introduction and objectives: as hip replacement is a procedure that is performed progressively in more young population, the revision surgery is often associated with progressive bone loss. Impaction bone grafting technique may help us to restore bone stock for future surgeries. The objectives are to expose a case of a patient that is operated from a second stage revision.

Methods: this is a case of a 56-year-old lady that suffers from chronic THR infection by *S epidermidis*, with loosening of the stem and progressive bone loss in the proximal third of the femur and thigh pain. The first stage of revision consisted on a cement-prosthesis spacer ("Kiwi" technique). After normalization of the acute phase reactants, in a second stage the spacer was removed and a femoral bone impaction grafting technique was employed with an Exeter stem and a non-cemented cup.

Results: the evolution of the patient was satisfactory, without thigh pain. No signs of reactivation of the infection were seen. After one year, the stem seems stable with images that suggest graft incorporation.

Conclusions: revision hip surgery in young patients has the great inconvenience of progressive bone loss. Although bone impaction grafting is a complex technique, it permits to restore bone facilitating future surgeries.

INCIDENCIA DE MORTALIDAD Y REINGRESO EN PACIENTES CON FRACTURA DE CADERA DIALIZADOS. (SECCA)

¿TIENEN LOS PACIENTES EN DIÁLISIS MAYOR RIESGO DE MORTALIDAD AL AÑO TRAS FRACTURAS DE CADERA INTERVENIDAS? (SECOT)

Sánchez Robles M, Lajara Marco F, Morales González I, Lanagran Torres A, Moreno Sánchez F, Soler Gutiérrez JF

Hospital General Universitario Reina Sofía, Murcia

Introducción: La relación entre diálisis y riesgo de fractura de cadera está bien definida en la literatura. Sin embargo, la relación entre enfermedad renal crónica dializada (ERCD) y la morbi-mortalidad en los pacientes con fractura de cadera, no ha sido cuantificada en nuestro entorno. El objetivo de este estudio es conocer la tasa de mortalidad al año y tasa de reingresos a 90 días en pacientes con fractura de cadera dializados, intervenidos quirúrgicamente en nuestro centro y determinar su asociación con otros factores de riesgo conocidos.

Material y metodos: Se incluyeron en el estudio los pacientes fractura de cadera en tratamiento con ERCD,

intervenidos en nuestro centro, con un seguimiento mínimo de un año, recogidos entre enero de 2011 y diciembre de 2017. Se plantea un estudio descriptivo, donde las variables dependientes son la mortalidad al año y el reingreso a 90 días y como variables predictoras, que pueden influir, se recogieron: la edad, el sexo, la presencia de demencia al ingreso, el tipo de fractura y la puntuación en la escala ASA.

Resultados: Se analizan retrospectivamente, 20 pacientes cumplieron los criterios de inclusión, con una media de edad de 81 años, 13 hombres, 3 presentaban demencia, 8 fueron fracturas intracapsulares tratada con prótesis y 11 pacientes fueron ASA 4. Se registraron 3 éxitos durante el primer año (tras 5, 7 y 11 meses de la fractura) (15%, mortalidad al año) y 4 reingresos por causas médicas en los primeros 90 días (20% reingresos). No se observó asociación de las variables predictoras ni con mayor mortalidad al año ni con mayor tasa de reingreso.

Conclusiones: Los pacientes con fractura de cadera dializados en nuestro entorno, presentan una tasa de mortalidad al año de 15% y una tasa de reingreso a 90 días del 20%.

Bibliografía

1. Hickson LJ, Farah WH, Johnson RL, Thorsteinsdottir B, Ubl DS, Yuan BJ, Albright R, Rule AD, Habermann EB. Death and Postoperative Complications After Hip Fracture Repair: Dialysis Effect. *Kidney Int Rep* 2018 7;3:1294-1303.
2. Lo LWT, Yanling X, Chou ACC, Howe TS, Allen JC, Koh JSB. End-Stage Renal Failure Is an Independent Risk Factor for 1-Year Mortality After Hip Fracture Surgery. *Geriatr Orthop Surg Rehabil* 2018 18;9:21514.
3. Ibarra Melogno S, Chifflet L, Rey R, Leiva G, Morales N, Albornoz H. Long-term results of hip arthroplasty in patients on dialysis for chronic renal failure. Mortality and implant survival in the National Registry of Uruguay since 2000. *Rev Esp Cir Ortop Traumatol*. 2019 63;187-191.

INCIDENCE OF MORTALITY AND READMISSION IN DIALYSED PATIENTS WITH HIP FRACTURE

Sánchez Robles M, Lajara Marco F, Morales González I, Lanagran Torres A, Moreno Sánchez F, Soler Gutiérrez JF

Hospital General Universitario Reina Sofía, Murcia

Introduction: The relationship between dialysis and hip fracture risk is well defined in the literature. However, the relationship between dialyzed chronic kidney disease (DCKD) and morbi-mortality in hip fracture patients has not been quantified in our environment. The aim of this

study is to determine the annual mortality rate and re-admissions at 90 days rate in patients with dialysed and surgery for his hip fracture in our centre.

Material and Methods: We included hip fracture patients with DCKD treated by surgery, in our center with a minimum follow-up of one year. We included all patients with these characteristics registered between January 2011 and December 2017. Was performed a descriptive study. The main variables studied were: mortality at one year and re-entry at 90 days. We also registered other predictive variables: age, sex, dementia at admission, type of fracture and score on the ASA scale.

Results: Twenty patients met the inclusion criteria with an average age of 81 years. There were 13 men, three patients with dementia, eight patients with intracapsular fractures treated with hemiarthroplasty and eleven patients were ASA 4. Three patients died during the first year (15% mortality/year) and four patients were readmitted in the first 90 days due to medical causes (20% readmissions).

Conclusions: Dialysed patients with hip fractures, in our environment, have a mortality rate of 15%, at one year and a re-admission rate of 20%, at 90 days.

PROSTHETIC DISLOCATION AS A PREDICTOR OF MORTALITY AT ONE YEAR AFTER HIP FRACTURE

Sánchez Robles M, Lajara Marco F, Lanagrán Torres A, Morales González I, Lax Pérez R, Martínez Sáez P

Hospital General Universitario Reina Sofía, Murcia

Introduction: Intracapsular hip fractures are an important socio-health problem due to their morbidity and mortality impact. The literature described numerous risk factors associated with mortality at one year. Our aim is to analyze if prosthetic dislocation could be included on the mortality predicting factors.

Material and Methods: We executed a retrospective analysis of intracapsular hip fractures in >65 years patients. They were intervened in our center between January and December 2017. The following factors were analyzed as predictors of mortality at one year: 1) patient-related factors: age, sex, cognitive impairment at admission, ASA (as an indicator of comorbidities). 2) surgery-related factor: preoperative delay, type of arthroplasty and 3) other factors: time on admission and dislocation of the prosthesis. We performed the statistical analysis of the data.

Results: We included in the study forty-two patients, with an annual mortality rate of 26%. We observed that

cognitive deterioration at admission is associated with higher mortality at one year with an OR of 13.86 ($p=0.0012$) and dislocation of the prosthesis is associated with higher mortality at one year with an OR of 11.25 ($p=0.048$). We also found a higher proportion of deceased patients per year in ASA 4 patients, without statistical significance. No higher mortality was found related to the other factors (age, sex, preoperative delay and time on admission).

Conclusions: Patients with dislocation of the prosthesis after intracapsular hip fracture have a higher incidence of death in the first year. Therefore, surgeons have to plan and purify the surgical technique to reduce this complication. Cognitive impairment at admission is a risk factor for mortality, but it is a not modifiable factor.

TOTAL HIP ARTHROPLASTY WITH A BURCH-SCHNEIDER ANTI-PROTRUSION RING AND AUTOLOGUS BONE GRAFT IN ACETABULAR FRACTURES OF ELDERY PATIENTS BACKGROUND

Marta Yáñez Hernández, Beatriz Fernández Maza, Sergio Bartolomé García, Aurelio Moreno Velasco, Jesús Campo Loarte

Hospital Universitario Puerta de Hierro Majadahonda, Madrid

We present a case of a 77-year-old woman with a left acetabular fracture that affected both columns, initially treated with trans-skeletal traction and developing a central protrusion of the femoral head, who underwent a total hip arthroplasty with a Burch-Schneider anti-protrusion ring and a cemented Heritage stem (Zimmer).

Material and Methods: A 77-year-old woman who had been run over was evaluated at another hospital, presenting with a fracture of the left cup that affected both columns, treated conservatively with trans-skeletal traction for 4 weeks, after which she started walking with the help of a walker.

She presented at our hospital at 4 months with continuing pain. The examination showed pain at 90° flexion, full extension, 30° external rotation and 20° internal rotation. X-rays and CAT scans were performed, showing an acetabular fracture that affected both columns with onset of consolidation and central protrusion of the femoral head.

She underwent a total left hip arthroplasty using a Hardinge direct lateral approach, demonstrating a central dislocation of the femoral head with significant involvement, as well as a cavity defect in the bottom of the cup of approximately 1.5cm in diameter, filled with autologous bone graft from the femoral head itself. The consolidation of the posterior column was checked. A 56-mm Burch-Schneider anti-protrusion cage was

implanted with 8 x 6.5-mm proximal screws, on which a 56-mm cup without rotational control and a 14-mm VerSys Heritage cemented stem with a 32 +7-mm ceramic head (Zimmer) were cemented. The stability of the prosthesis was checked intraoperatively.

Results: At two years, the patient is asymptomatic and walks without technical aids. On X-rays, the ring shows no signs of mobilisation. The stem presents areas of radiolucency in zones 2, 4 and 5 that have not progressed in the past year.

Conclusions: Total hip arthroplasty with a Burch-Schneider anti-protrusion ring and autologous bone graft it's an alternative in displaced acetabular fractures in elderly patients.

References:

1. Enocson. A, Blomfelt. R. Acetabular Fractures in the Elderly Treated With a Primary Burch-Schneider Reinforcement Ring, Autologous Bone Graft, and a Total Hip Arthroplasty: A Prospective Study With a 4-Year Follow-Up. *J Orthop Trauma*. 28(6):330-337, JUN 2014.
2. Tindemark. J, Blomfeldt. R, Ponzer. S, Söderqvist. A, Törnkvist. H. Primary total hip arthroplasty with a Burch-Schneider antiprotrusion cage and autologous bonegrafting for acetabular fractures in elderly patients. *J Orthop Trauma*. 2003 Mar;17(3):193-7.

MODIFIED STOPPA APPROACH COMBINED WITH FIRST LETOURNEL WINDOW: BACKGROUND

Marta Yáñez Hernández, Beatriz Fernández Maza, Sergio Bartolomé García, Aurelio Moreno Velasco, Jesús Campo Loarte

Hospital Universitario Puerta de Hierro Majadahonda, Madrid

We present a case of a 63-year-old man who underwent an osteosynthesis of the spine, anterior wall and roof of acetabulum using a modified Stoppa approach and of the iliac using a first Letournel window, thereby saving the anatomical region involved in the Letournel ilioinguinal approach having been operated on for right inguinal herniorrhaphy.

Material and Methods: 63-year-old man with a history of right inguinal herniorrhaphy, who was brought to our A&E department after being run over while cycling. Upon arrival, he was treated according to ATLS protocol, ruling out respiratory or haemodynamic compromise. He presented with significant pain in the right hemipelvis, as well as functional impotence in LRL. He underwent a

simple radiological study and CT, which showed a fracture involving the anterior column and wall and roof of acetabular, as well as a longitudinal line that affected the ilium.

After a preoperative plan, osteosynthesis of the iliac was performed through a lateral Letournel window by means of a cannulated screw and a 5-hole plate, followed by osteosynthesis of the column and anterior wall and roof of acetabulum using a Stoppa approach modified with a suprapectineal plate (Stryker®).

In the immediate postoperative period, an LL Doppler echocardiogram was performed following the usual protocol at our hospital for pelvic fractures, which ruled out vascular disease.

Results: After 12 months, the patient is asymptomatic and is playing sports again. He has not presented with any complication so far. The fracture is consolidated in a good position, conserving a good joint space and the sphericity of the femoral head.

Conclusions: The modified Stoppa approach enables adequate management of the anterior column of the acetabulum, thereby minimising the risk of complications.

References

1. Kacra BK, Arazi M, Cicekcibasi AE, Buyukmumcu M, Demirci S. Modified medial Stoppa approach for acetabular fractures: an anatomic study. *J Trauma*. 2011;71(5):1340-4.
2. Hammad AS, El-Khadrawe TA. Accuracy of reduction and early clinical outcome in acetabular fractures treated by the standard ilio-inguinal versus the Stoppa/iliac approaches. *Injury*. 2015;46(2):320-6.

EPIDEMIOLOGICAL STUDY OF PERIPROSTHETIC HIP FRACTURES

Flores San Martín M, Ruiz De Las Morenas P, Calvo Tapiés J, Torres Campos A, Gómez Vallejo J, Albareda Albareda J

Universitary Clinic Hospital "Lozano Blesa". Zaragoza

Introduction: Periprosthetic hip fractures is a relatively infrequent pathology difficult to manage and potentially serious, especially in terms of morbidity and mortality. As there are many factors that increase the risk of suffering a periprosthetic fracture, existing literature provides very variable results.

Objetives: The aim of this study is to know the epidemiological profile and the characteristics of periprosthetic fractures in our population, as well as compare our

Hospital's mortality in relation to other published series and study certain risk factors associated with mortality.

Materials and Methods: We retrospectively reviewed a population of 75 patients that suffered periprosthetic hip fracture from October 2010 to October 2016.

Results: 26 of the participants were men (34.7%) and 49 women (65.3%) with a mean age of 81.01 years and a mean hospitalization term of 15.23 days. The average time from prosthesis implantation to fracture was 99.78 months. The mean time since the periprosthetic fracture occurred until death of the patient was 18.21 months (11.35-25.05). Sixteen (16) patients (21.33%) died the first year after implantation, 3 of them before undertaking surgery. The cemented primary prostheses fractured an average of 84 months after implantation while the average period for non-cemented prostheses was 134 months, resulting in an statistical significant difference ($p = 0.034$). The mean age at the time of the periprosthetic hip fracture was of 78.92 years for the non-cemented group and of 82.95 years for the cemented group, a non significant difference ($p = 0.058$). Thus, according to our data sample, periprosthetic fractures occur earlier in cemented implants.

Conclusions: Periprosthetic hip fractures are more frequent in women. The time between the implantation of the prosthesis and the appearance of the fracture is greater in those that are non-cemented, with no significant differences in terms of age or primary prosthesis implantation cause. Further studies are necessary to conclude if cementation generates any changes in bone structure that favour fractures. In this research at the time of the periprosthetic fracture, patients's mortality and average age was higher to those of other studies.

CEMENT TECTOPLASTY IN TWO-STAGE PROCEDURE FOR HIP ARTHROPLASTY INFECTION, A TECHNIQUE TO IMPROVE SPACERS STABILITY

Anna Fraile Suari, Nerea Goicoechea Sadaba, Berta Gasol Cudos, Alfonso León García, Marc Tey Pons, Fernando Marques López

Hospital del Mar, Barcelona

Introduction and Objectives: One of the most common approaches to treat chronic hip arthroplasty infection is a two-stage replacement, with a high success rate using an antibiotic-impregnated cement spacer between stages.

The risk of dislocation of these spacers has been reported as high as 7%. In cases with important acetabular defects, cement tectoplasty is proposed as an approach, creating an acetabular cement roof placed during the first stage surgery, fixed with screws to the residual acetabular bone, augmenting the containment surface for the spacer.

The purpose of this study is to assess the stability of the spacer in a two-stage replacement procedure as the management of a hip arthroplasty infection, where the tectoplasty has been used in the first-stage surgery, and its effect on healing a chronic infection.

Materials and Methods: An observational retrospective study was performed, including ten cases of chronic hip prosthesis infection where a tectoplasty was performed during first-stage surgery in a two-stage replacement procedure.

The variables included are: age, sex, side, indication for the tectoplasty, results of the cultures, acetabular defect according to Paprosky classification, previous surgeries, spacer dislocation and functional outcome by Merle Postel D'Aubigne scale.

Results: We report ten cases of chronic arthroplasty infection with acetabular defect, treated between 2014 and 2019, where this technique was performed. Eight men and two women, with an average age of 70.5 (interquartile range 17.7).

According to the Paprosky classification four patients presented type IIIB defect, three type IIIA, two type IIC and one type IIA.

In seven cases the tectoplasty was chosen after assessing instability during surgery to avoid spacer dislocation, and in three cases after an already existing spacer dislocation.

Time to the second-stage, in which the tectoplasty was removed averaged 3.5 months (IR 2.1), with only one spacer dislocation during this period. The healing ratio of the chronic infection was 9 of 10.

Conclusions: The tectoplasty improves spacers stability in hip arthroplasty infection with acetabular defect, offering our patients better functionality between stages.

MANAGEMENT OF ACETABULAR FRACTURES THROUGH TOTAL HIP ARTHROPLASTY WITH ANTERIOR APPROACH

Jordá-Gómez P, Escribá-Urios I, Ferras-Tarrago J, Castro-Gil J, Aracil Silvestre J

Hospital Universitari i Politècnic La Fe de Valencia

Objective: Acetabular fractures in elderly patients present a therapeutic challenge, since their osteosynthesis may be hampered by comminution and poor bone quality. In certain cases, a good solution is acute total hip arthroplasty (THA). In our center, we have long experience with the anterior approach, and give us a good solution in this cases because

provide a stable, painless construct capable of rapidly recovering its pre-injury level of function. Our aim was to review all patients with acetabular fractures treated by total hip arthroplasty with anterior approach performed in our center.

Patients and Methods: A total of 18 patients with acetabular fractures (severe acetabular impaction with or without concomitant femoral head injury) from which they are collected: demographic data, classification of fractures, surgical data, clinical and functional evaluation and evolutionary radiographic, together with perioperative complications.

Results: The mean follow-up of the patients was 34 months (12 DS), with a final functional assessment of 96.5 for Harris Hip Score, and of Merle D'Aubigné excellent in 93%. The radiological controls have been satisfactory without prosthetic loosening, which indicates good results. Only two patients presented low-grade heterotopic calcifications. The majority of the patients (91%) presented an optimal postoperative recovery, with immediate loading. Only one exitus was observed for reasons unrelated to the surgery. Two patients presented a major perioperative complication, one have a greater trochanter fracture with medialization of the cup one month later and another wasn't able to follow our recommendations for the postoperative period, suffered a fall and reintervention was necessary for another medialization of the cup.

Conclusion: In comminuted acetabular fractures, acute THA with a direct anterior approach in the supine position and under control of the scope with or without associated minimal osteosynthesis, facilitates an adequate stabilization of the fracture with complete functional recovery of the patient with immediate loading and excellent short and midterm results.

PERIOPERATIVE AND SHORT TERM RESULTS OF THE USE OF SHORT STEMS IN TOTAL HIP ARTHROPLASTY

Ruiz de las Morenas P., Flores San Martín M., Redondo Trasobares B., Calvo tapies J.R., Torres Campos A., Albareda Albareda J

Universitary Clinic Hospital "Lozano Blesa". Saragossa

Introduction: The search of less invasive procedures has made the application of short stems popular. These implants improve osseous stock preservation and load transmission to the proximal femur decreasing, among others, thigh pain. Their implantation usually entails a complex surgical technique and is not exempt of complications, including malposition and periprosthetic intraoperative fractures. The purpose of this study is to provide our short-term experience with the implantation of the metaphyseal anchoring, short stem Evolution®.

Material and Methods: A descriptive, retrospective study was made including all patients operated on total hip replacement using the short, cementless stem Evolution® in a Level 1 Orthopedic and Trauma Center between January 2016 and January 2019. The collected data comprised sociodemographic variables, size and type of implants, component orientation and intraoperative and early complications. Functional results were evaluated with Merle d' Auvigné and Postel Scale.

Results: The series comprises 59 patients, 48 men and 11 women, with a mean age of 59 years. The average follow up was of 18 months. The mean postoperative Merle Score was 16, with 17% excellent and 72% good clinical results. No cases of thigh pain, infection or prosthesis luxation. In 6 cases (10,16%) a periprosthetic intraoperative fracture was produced, which could be treated during the same surgical act with cerclages and without changing the implant or delaying extremity load. All of these fractures occurred during the first two years of use of this stem. They related significantly to a bigger stem size ($p=0,032$), but neither with malposition of the same ($p=0,06$), Dorr type ($p=0,72$), sex nor the age of the patient.

Conclusion: The short-term clinical results of our series using the short stem Evolution® were excellent and good with a mean score of 16 points in Merle's scale. Although neither intervention nor clinically relevant complications occurred, the incidence of periprosthetic intraoperative fractures was high (10,16 %) and was significantly related to the use of big femoral stems. The study has been performed during the first 3 years of use of this implant and future research should analyze if this percentage can be lowered, in which case it might be associated to the learning curve of the operating surgeons.

TOTAL HIP ARTHROPLASTY IN TEENAGERS

Ricardo Fernandez Fernandez, Luis Moraleda Novo, Joaquin Nuñez De Armas, Ana Cruz Pardos, Enrique Gil Garay

Hospital La Paz, Madrid

Introduction: Total hip arthroplasty (THA) is rarely indicated in very young patients. Problems in this age group include poor bone stock, narrow femoral canal, multiple previous surgeries and systemic diseases.

Aim: To analyse the clinical and radiological results following THA in patients under 21 years.

Methods: We studied total hip replacements implanted in patients under 22 years between 2000 and 2018. We included 36 THA in 28 patients with a mean age of 16.74

years (11 to 21). Mean weight was of 53.2 Kg and mean BMI was 21.7 Kg/m². Diagnosis included: 14 juvenile rheumatoid arthritis, 13 osteonecrosis of the femoral head (3 were secondary to femoral neck fracture), 3 spondyloepiphyseal dysplasia, 2 Perthes disease, 2 developmental dysplasia of the hip (DDH) and one patient with idiopathic chondrolysis of the hip. Eight of the patients had undergone multiple previous surgical procedures. All implants were cementless except one cemented stem. Median acetabular size was of 46 millimetres. 24 cups required additional screw fixation. Morcellized autologous bone graft was used in 4 hips to restore the hip centre. One hip required structural autologous graft and another a shortening femoral osteotomy. Ceramic on ceramic bearing was employed in 34 of the replacements.

Radiological analysis included component orientation, hip centre restoration, the presence of radiolucent lines or osteolysis. Engh criteria were used to assess fixation and migration of the components. Intraoperative and postoperative complications were recorded. Harris Hip Score (HHS), Oxford Hip Score (OHS) and EuroQOL-5D scale were used to evaluate clinical results.

Results: One acetabular component was revised for osteolysis. Two additional cups were revised for aseptic loosening. There were three intraoperative femoral fractures, requiring two of them exchanging the stem. There were two sciatic nerve palsies (one of the was transient). There were no infections or dislocations during the study period.

All patients were satisfied with their surgery. According to EuroQOL-5D scale patients did not referred problems related to mobility, self-care or anxiety/depression. Patients reported slight problems in usual activities and pain/discomfort. Mean HHS and OHS were of 94.7 and 39.7 points respectively at the end of the follow-up.

Conclusion: Total Hip Arthroplasty provides satisfactory clinical results with a low complication rate at short time follow-up in the very young patient.

SHORT TERM FAILURE RATE IN ACETABULAR CUP REVISION USING IMPACTED MORSELIZED ALLOGRAFT

Mencia Barrio, R; Trapote Cubillas, A; de la Cruz Gutiérrez, L; Sánchez-Robles Hurtado, A; Rebollo García MP; Domínguez Domínguez A

Hospital Universitario de León

Introduction: Since the University of Nijmegen in Holland demonstrated good integration of allografts to the host bone in the mid 1980's, this technique has been widely used in reconstruction of acetabular defects. More

recently, with the appearance and very good results of porous metal, we asked our self if the "Sloof technique" still is of value.

Methods: We retrospectively reviewed 709 dual mobility hip cups implanted from 2009 till 2018. In 174 cases the reason was aseptic loosening. In all of these, the "Sloof technique" was applied. We classified the acetabular defects according to the Paprosky classification.

Results: From the 174 dual mobility cups implanted with impaction of bone allograft (Sloof technique), 16 cases had to be revised (4 because of infection; 12 because of aseptic loosening). The cup survivorship was 93,11% over 5 years. 0% dislocation rate (except in 3 cases of aseptic loosening of the cup). 0% intraprosthetic dislocation. Early onset loosening of the cups occurred in Paprosky 3A and 3B defects, probably due to an incorrect indication.

Conclusion: The allograft impaction technique with a cemented dual mobility cup still has acceptable good results and a lower dislocation rate, than conventional revision cups. In advanced acetabular defects with poor host bone stock, the actual preference tends towards porous metal constructions, in combination with cup cages, porous metal augments and cups.

ACUTE ACETABULAR FRACTURE OF THE ELDERLY TREATED WITH REINFORCEMENT RINGS

Mencia Barrio, R; Gallego Díez, L; de la Cruz Gutiérrez, L; Trapote Cubillas, A; Arias Martín, F; Marcos Mesa, R

Hospital Universitario de León

Introduction: The incidence of low energy acetabular fractures of the elderly is increasing. There is a typical fracture pattern present in the majority of the cases: Anterior or posterior wall fracture with medial displacement of the femoral head and fracture of the quadrilateral plate. The often present dome impaction (gull sign) is associated factor for negative outcome.

Methods: Retrospective study (January 2014 till January 2017). 8 patients. Mean age 75(72 till 86). Average surgical delay 12 days (5-30). ASA II 3 patients. ASA III 4 patients. ASA IV 1 patient. We used GAP II reconstruction ring. In 5 patients we used a double mobility cemented cup. SHP cemented cup in 3.

Results: Two patients died in the first 48 hours. Partial load bearing and mobilisation at 48 hours.

Conclusion: Despite the limitations of the study (small series of cases, high mortality rate), acetabular fractures of the elderly can be treated successfully with a reinforcement

ring and a cemented hip cup, which allows early weight bearing and mobilisation.

RESTORATION OF BIOMECHANICAL AND ANATOMICAL VALUES AFTER TOTAL HIP ARTHROPLASTY: RETROSPECTIVE OBSERVATIONAL STUDY

Montoya Sáenz R., Borrego Ratero D., Ramos Junquera L

Complejo Asistencial de Salamanca

Objectives: We perform a descriptive analysis of the different models of Total hip Arthroplasty used in our environment over a full year, comparing them as restoration of the femoral offset and impact on the functionality of patients.

Material and methods: A systematic review about the articles published in the last 10 years, followed by a retrospective observational study of the cases operated of coxarthrosis in the area of care of the CAUSE in the period From 1 January 2016 to 31 December 2016. We use as variables: Pre and postsurgical femoral offset, prosthetic head and stem type.

Results: A total of 186 implants have been analyzed during the study period, excluding the cases of revisions, failure to follow-up and cemented stems. The average offset values before the intervention were 46.84 mm and the prosthetic offset 49.25 mm. The stems used most frequently were the type Avenir (ZIMMER-BIOMET), Novation (EXATECH) with standard and extended offset, Taperloc (ZIMMER-BIOMET) and Furlong (JRI). Thirty-five femoral heads of increased length, Seventy-Eight descended, and seventy-three neutral were implanted. Respect to the offset, anatomical values (-5/+ 5 mm) have been restored in 69.9%, reduced by 25.3% and increased by 4.8%.

No significant differences were found between the different models of stems and heads used and the proper restoration of the offset. It has been objective a functional gait and maintenance of the muscle power abductor in those patients with conserved offset.

Comments and conclusions: the major limitation of the study derives from the calculation of the offset, given the variability in the radiological technique observed, and the manual measurement by two observers outside the surgical team. As well as the vagueness of the clinical histories and the observer's bias in the functional study.

Several published articles indicate a greater functionality after the conservation of the femoral offset or increase

of the same, with greater range of movement and lower risk of loosening and dislocation of the implant.

The success of total hip arthroplasty depends on many factors, but we propose the importance of improving those within our reach, such as the correct choice of implant and the maintenance of the femoral offset, by means of a correct Presurgical planning.

The use of modular prostheses has been proposed for the best control of the femoral Offset, but there has been an increased risk in its implantation by increased friction between components.

DEIMPLANTATION OF CEMENTED STEM IN A PARTIAL HIP PROSTHESIS. BE CAREFUL WITH THE REDUCTION MANEUVERS!

Sergio Bartolomé García, Marta Sanz Perez, Aurelio Moreno Velasco, Jesus Campo Loarte, Pedro Torrijos Garrido, Pablo de la Cuadra Virgili

Introduction: Dislocation of partial cemented hip prosthesis is a complication that can occur between 1% and 3% of cases according to different series, and that requires a closed reduction in operating room under anesthesia as an emergency. The appearance of a deimplantation of the stem during the reduction maneuvers is a rare complication whose actual incidence is unknown, and whose risk increases with the use of polished cemented stems.

Material and Methods: We present an 89-year-old patient who came to the Emergency Department in December 2018 with pain and functional impotence in the left hip after a casual fall, and was diagnosed with a sub-capital femoral fracture femur type Garden IV. Among his antecedents he presents residual left hemiplegia secondary to meningioma and moderate dementia. The patient is operated with a bipolar partial arthroplasty using a double-wedged polished cemented stem by direct lateral approach (Hardinge). Immediate postoperative course without complications, being discharged 72 hours after the intervention.

Results: The patient re-enter at 4 weeks due to swelling and enlargement in the surgical area, with suspicion of infection, and with left limp in external rotation and shortened. In the radiological study, an anterior prosthetic dislocation can be seen. The patient undergoes a closed reduction attempt under anesthesia. After forced maneuvers, and when placing the patient in traction table to try progressive reduction, a deimplantation of the stem is verified. After discussing the situation with the family, it was decided to perform resection arthroplasty as a definitive treatment. Three months after the intervention, the patient

performed bed-chair life without pain, collaborating in the transfers.

Conclusions: This case illustrates the importance of performing gentle reduction maneuvers in prosthetic hip dislocations, especially with cemented polished stems. The presence of a small cement pedestal in the area of the greater trochanter over the prosthetic shoulder can prevent this infrequent but devastating situation. In case of presenting the same, it's necessary to perform a prosthetic revision, and it's possible to make a cement on cement technique or a resection arthroplasty.

SECONDARY AVASCULAR NECROSIS AFTER INTERTROCHANTERIC FRACTURE HEALED. A RARE COMPLICATION

Sergio Bartolomé García, Miriam Zurrón Lobato, Pedro Torrijos Garrido, Aurelio Moreno Velasco, Jesús Campo Loarte, Pablo De La Cuadra Virgili

Hospital Universitario Puerta de Hierro-Majadahonda, Madrid

Introduction: Avascular necrosis of the femoral head is an unusual complication in patients with an intertrochanteric fracture healed. The series included in the literature classify this complication as 0.8%, with risk factors being a proximal fracture line, young age and the use of sliding screw-plate systems.

Material and Methods: We present an 86-year-old patient who visited our center in August 2017 with pain and functional impotence in the right hip, being diagnosed with an unstable intertrochanteric femoral fracture. The patient is operated 24 hours after admission with a locked proximal femoral nail, achieving a good reduction, with a combined tip-apex distance (TAD) of 15 mm. The immediate postoperative period is without incident, presenting an assisted walk with walker at 6 weeks after surgery without pain. The patient came to revision 8 months after the initial surgery due to pain and progressive functional impotence during 2 months, and with inability to walk. Imaging tests (simple radiology and CT) show the healing of the previous fracture and a partial bone necrosis of the supero-external area of the femoral head with collapse and protrusion of the cephalic screw.

Results: Surgical intervention was planned, with extraction of the previous osteosynthesis material and implantation a hybrid total hip prosthesis, with cementless acetabulum supplemented with 2 screws and a long-polished cemented stem with calcar support. One year after the surgery, the patient presents assisted walking without pain, and a score of 14 with the Merlé-d'Aubigne scale.

Conclusions: The frequency of avascular necrosis of the femoral head in elderly patients with intertrochanteric

fractures may be underestimated due to loss of follow-up. The appearance of progressive groin pain should make us suspect the rare possibility of avascular necrosis or a sub-capital femoral neck fracture.

METAL-ON-METAL HIP ARTHROPLASTIES: CORRELATION BETWEEN THE INCREASE IN SERUM IONS LEVEL AND THE ANGLE OF THE ACETABULAR COMPONENT INCLINATION

Silvia M^a Miguela Alvarez, Rodrigo Fernando Luna Gutierrez, Agusti Bartra Ylla, Francesc Anglès Crespo

Hospital Universitari Mutua de Terrassa

Objectives: Metal-on-metal bearing surface for Hip Arthroplasty have been an attractive option in young patients with high functional demand due to their lower linear wear rate. There has been a decrease in their use due to specific complications and physiological adverse reactions events related to an increase of metal ion levels in serum.

The objective of our study is to correlate serum metal ion levels with the angle of acetabular inclination in patients with a metal-on-metal bearing surface.

Material and methods: A retrospective review including patients operated between 2002 and 2011 at our Institution with a metal-on-metal hip arthroplasty. Serum chrome (Cr) and cobalt (Co) levels and angle of inclination of the acetabular component were measured. A Pearson correlation coefficient was calculated for the levels of Cr and Co and angle of inclination. Other variables recorded included follow-up time, Harris Hip Score and complications.

Results: A total of 166 patients were included. 65 patients were excluded due to death (not related to the procedure), loss to follow-up or missing metal ion levels or radiographs. 101 patients were eligible for analysis (25 women and 76 men). Mean age was 55 years (26-70). 93 patients had a conventional total hip replacement and 8 were resurfacing prostheses. The mean time to follow-up was 10 years (5-17).

The average angle of inclination was 45.7° (26-71°)

The correlation coefficient (r) between angle of acetabular inclination and the increase of metal ion levels is moderate for Cr (r= 0.31) and slight for Co (r=0.25).

There is an inverse correlation between the size of the head and Cr levels r= -0.14 and a weak correlation between the size of the head and Co levels r=0.1).

The average Harris Hip Score was 94.01 (55.8-100).

Five patients (4.9%) required revision surgery. Two of these patients (1%) presented a pseudotumor with an increase of ion levels in serum. The average time to revision surgery was 6.5 years.

Three patients had a significant increase in serum ion levels at last follow-up. All of these patients had a HHS of 100. The angle of inclination for these patients were 69, 60 and 48 degrees. All three are scheduled for revision.

Discussion and Conclusions: Metal-on-metal hip arthroplasty has been an attractive option for patients with high functional demand. A biannual analytical follow-up is recommended. In our series, there were three patients with a HHS of 100 who presented inadmissible serum cobalt levels $> 20 \mu / L$ (according to the SECCA guidelines) and four patients with a very abnormal cobalt elevation $\geq 10 \mu / L$ (according to SECCA), all of them with angle of inclination of the acetabular component $> 50^\circ$.

Our results suggest there is a moderate correlation between the verticality of the acetabular component and the increase of serum ions level. For this reason, follow-up patient with angles $> 50^\circ$ is essential.

These results are in accordance with the importance of proper follow-up for patients with MoM bearing surface arthroplasties, especially in patients with an angle of inclination $> 50^\circ$.

ANALYSIS OF THE BENEFITS CONTRIBUTED BY FAST-TRACK PROCEDURES IN TOTAL HIP ARTHROPLASTY

Clara Esteban Tudela, Nuria Olmedo García, Encarnación Cruz Renovell, Adela Mesado Vives, Vicente Granell Beltrán

General University Hospital of Castellón

Purpose: To assess whether the implementation of fast-track procedures in patients undergoing total hip replacement has conditioned better results.

Material and methods: We retrospectively reviewed a group of patients who had undergone surgery before introduction of the different procedures included in the fast-track protocol (period from January to June 2017, 41 patients) and was compared with a second group of patients to whom the fast-track protocol was implemented (period from June to October 2018, 38 patients). In the second group, we studied the introduction of the different procedures in the protocol: preoperative optimization of hemoglobin, assistance to prosthetic schools and physiotherapy

before the intervention, perioperative use of intravenous and local tranexamic acid, as well as methyl-prednisolone IV and early mobilization patterns. The following variables were analyzed: the level of hemoglobin preoperative period and its optimization, postoperative blood loss, need for transfusion, at which time the sitting was held and the postoperative standing, length of stay, wound revision, readmissions and emergency visits during the 1st month, and gait after discharge. We used SPSS-version22 for the analysis of the data.

Results: The group of patients submitted to the fast-track protocol presented a higher level of preoperative hemoglobin, no patient required hemotransfusion, we evidence a reduction in blood loss (2.1 vs. 2.6 with $p 0.013$), length of stay (2.2 vs. 3.8 $p 0.001$), sitting (23 vs. 40 hours, $p 0.001$) and the earlier walking (40 vs. 60 hours, $p 0.001$). No statistical significance was obtained in the analysis of complications and readmissions.

Discussion and Conclusions: The implementation of the fast-track protocol includes effective procedures for reducing the need for transfusion and their complications, favors the earliest reincorporation to daily activities, and decreases the length of stay.

PAINFUL TOTAL HIP ARTHROPLASTY CAUSED BY PROTRUDING TRANSACETABULAR SCREWS OF A STABLE CUP

Caribay Vargas Reveron, Clara Chimeno Pigrau, Xoana Soutelo Saavedra, Ernesto Muñoz Mahamud, Jenaro Fernandez Valencia, Andreu Combalia Aleu

Hospital Clinic de Barcelona

Painful total hip arthroplasty can be challenging. Once infection and loosening are ruled out, multiple causes could be the cause of the pain. We present an uncommon case of pain after total hip arthroplasty caused by multiple screws protruding out of the bone and impinging the surrounding soft tissues, affecting the iliopsoas muscle and tendon, the external obturator muscle and the sciatic nerve. The pain disappeared after removal of the screws, maintaining the stable cup in place.

A 56 years-old woman with persistent pain after the revision of a loosened cup. The pain was localized in the groin with radiation to the anterior part of the thigh, associated to most of her daily activities consequently decreasing activity and developing a progressive general hypotrophy of the left hip muscles. Infection, loosening and the presence of collections around the joint were ruled out. A small sample of periprosthetic liquid was obtained for microbiological study, with negative cultures. A magnetic resonance with MARS was performed, depicting the conflict of the screws with the

surrounding soft tissues. The patient underwent infiltration of iliopsoas muscle over the anterosuperior rim of the cup with bupivacaine and a long release corticosteroids (Trigon Depot® 1mL) guided by ultrasonography. Providing minor temporary improvement of the symptoms.

In the surgical procedure, the stability and correct anteversion of the cup were confirmed. The anterior border did not protrude impinging the psoas. The cup was left in place, and all the screws were removed. The intraoperative maneuvers testing stability were satisfactory and leg-length was assessed both clinically (comparing knees, quadriceps muscle tension, and with kick-off test) and using intraoperative radiography evaluating the relationship between the lesser trochanter and the ischium.

The patient reported a complete resolution of pain a few hours after the procedure. She began to sit and walk the day after the surgery, with an uneventful postoperative evolution. The patient was discharged on day four after the procedure. At the 3 year follow-up, the patient maintains a satisfactory evolution and continues to be free of pain. Improving the Merlé d'Aubigné preoperative of 8 (2-5-1) to 15 (6-5-4).

The predrilling of holes for the anchoring of screws and pegs, or the own protruding material can damage vessels, nerves and muscles. Incorrect positioning has been described to endanger the iliac vessels, and can lead to death both postoperatively or even during the surgical procedure. We present a case of atypical pain with transitory relief after an infiltration and the protrusion of screws causing impingement of the surrounding soft tissues, with complete pain remission after removal.

TOTAL HIP ARTHROPLASTY AS TREATMENT OF ACETABULAR FRACTURES IN THE ELDERLY

Bruno Capurro Soler, Mauricio Gidi Lantadilla, Paula Serrano Chinchilla, Marc Tey Pons, Alfonso León García, Fernando Marqués López

Hospital del Mar - Parc de Salut Mar, Barcelona

Objectives: To assess the survival and the medium-term clinical outcomes of total hip arthroplasty (THA) as a treatment for acetabular fractures in the elderly.

Methods: Retrospective study including patients with acetabular fractures older than 65 years treated with THA between 2008 and 2018, a minimum follow-up of 1 year. The electronic clinical record of the hospital was used and analyzed: type of fracture (Judet and Letournel classification), mechanism of injury, associated injuries, use of traction, time between fracture and surgery, type of implant,

intra and post-operative complications. Clinical evaluations using the scale of Merlé d'Aubigné-Postel (MAP). Statistical analysis was performed with SPSS 18.0.

Results: Seven cases were included, mean age 76.4 years (67-85), 5 men, 2 women, BMI 28.3 (21.7-42.8), ASA 3 (2-3). The most frequent type was fracture of the anterior column associated with posterior hemi transverse (5 cases). Low energy mechanism in 4 cases and 3 high energy. Two cases presented associated fractures. Soft traction in 5 cases with average 10 days (6-12) and 2 cases with transesquelic traction 12 days (12-14). The median time to surgery was 3 weeks (1-12).

The most used implant (5 cases) acetabulum review of uncemented tantalum, average of 4 screws (3-5) and non-cemented stem (4 cases). In all cases, femoral head autograft was used in the acetabular area. Average follow-up of 5.46 years (1.5-10). MAP postoperatively at one year was 16.6. There were no intraoperative complications. Radiographic consolidation of the fracture in all patients at the 3-month control. The post-operative complications were a case of avulsion fracture of the greater trochanter after a new casual fall treated conservatively and a case of dysmetria > 1.5 cm. There were no cases of aseptic loosening. There was an exitus at age 6 for non-traumatologic reasons. No significant differences were found between survival rates and postoperative MAP between the different types of fracture pattern, energy mechanism, nor in intraoperative and postoperative complications.

Conclusions: The treatment with THA in acetabular fractures in the elderly presents good clinical results, without increasing the risk of intraoperative or postoperative complications with high survival in the medium term.

Keywords: Total Hip Arthroplasty, Pelvic Fracture, Elderly, Outcomes

INDICATIONS OF ARTHROSCOPIC HIP SURGERY IN A PUBLIC HEALTH SERVICE

Bruno Capurro Soler, Marc Tey Pons, Alfonso Alias Petralanda, Fernando Marques Lopez, Alfonso León García, Joan Carles Monllau García

Hospital del Mar, Barcelona

Introduction: Arthroscopic hip surgery described since 2001 has presented an important increase during the last decades, but there has been disagreement among specialists regarding its real contribution in a public health system. That is why the objective is to analyze whether in a third level hospital, with a reference population of 250,000 patients, it is justified to incorporate arthroscopic hip surgery in the orthopedic surgery and traumatology services portfolio. The hypothesis is that the volume of surgeries

and the improvement of the clinical scores of patients in the different pathologies treated justify the incorporation of this procedure in hospital practice.

Methods: A retrospective study was carried out with a prospective follow-up sample, in which the indications and results of arthroscopic hip surgeries performed in a first level hospital between 2015 and 2016 were analyzed, with a minimum of a two year followup.

The different pre- and post- operative clinical scores for the different indications were analyzed: in the cases of primary joint pathology type Femoroacetabular impingement (FAI) the IHOT-33, NAHS and HOS were used; in the pathology of the trochanteric pain syndrome, NAHS, and the Merle Aubigne-Postel (MAP) in pathology of prosthetic revision. Intra and postoperative complications were also analyzed.

Results: We obtained a total of 99 cases, age range from 16 to 78 years, the indications of pathologies obtained have been FAI surgeries (66 cases), middle gluteus tendinopathy (21 cases), painful hip prosthetic revision (Impingement of the psoas tendon and biopsies) (6 cases), space surgeries deep gluteus (debridement of the sciatic nerve) (4 cases), synovial pathology (1 case of synovial chondromatosis and 1 of pigmented villonodular synovitis). Significant improvement was observed in all the scores for the different pathologies according to the published results for the different surgical indications (IHOT-33 preoperative 45 to postoperative 70, NAHS preop 59 to postop 89 and HOS preop 49.5 to postop 79, NAHS preop 28 to 55 postop, MAP preop 14 to 16 postop) and there were no intra- and postoperative complications.

Conclusions: The quantity and results of arthroscopic hip surgeries obtained in the first two years justify the incorporation of this technique in the orthopedic and traumatological surgery service of a third level public hospital.

Keywords: Hip Arthroscopy; Indications; Outcomes; Public Health

PUBLIC HOSPITAL EXPERIENCE IN HIP ARTHROPLASTY USING SUPERPATH APPROACH. BASED ON A SERIES OF CASES

Borja Fernández Blanco, Imanol Perez Hevia, Verónica Fernández Rodríguez, Felix Dominguez Dominguez, Francisco Alejandro Braña Vigil, Pedro García Prado

HUCA, Oviedo

Objectives: Total hip arthroplasty has been one of the most successful orthopedic procedures. Nowadays it can be performed through mini-incisions.

Our purpose is to show our experience in the Superpath approach, comparing it with the conventional transgluteal lateral approach, in terms of blood loss, differences in rehabilitation and evaluation of functional outcome in both groups.

Material and Methods: This is a prospective comparative study in patients with primary arthrosis. Duration of 2 years. A sample of 34 patients was taken, 17 were operated with Superpath approach (mean age 67,4) and 17 were operated with transgluteal lateral approach. All of them were operated by the same surgeon. In both groups it was used the same type of prosthetic components. The exclusion criteria were femoral neck fractures and severe acetabular defect. Intra-hospital and postsurgical (functional) follow-up: 1 month, 6 months and 1 year.

Results: Patients operated by Superpath approach had shorter incision length, longer operating room time, less blood loss (only one patient required transfusion) a decrease in postoperative analgesic need, less hospital length of stay, reduced total cost, less complications (re-entry) and possibility of early start of ambulation. The preservation of the external rotators, capsule and abductors seems to have no effect on the placement of the implants, compared to the conventional approach.

Comments and Conclusions: Our experience tells us that hip arthroplasty through the supracapsular approach with percutaneous assistance is a good alternative for primary hip osteoarthritis treatment, with good clinical-functional and cost-benefit results.

ACETABULAR RING OF RECONSTRUCTION: A GOOD SOLUTION IN PERIPROSTHETIC PELVIC DISCONTINUITY

Borja Fernández Blanco, Tamara Fernández Ardura, Imanol Perez Hevia, Felix Dominguez Dominguez, Francisco Alejandro Braña Vigil, Pedro Garcia Prado

HUCA, Oviedo

Objectives: The Periprosthetic Pelvic Discontinuity is a serious complication of the hip arthroplasty, which alters the stability of the hemipelvis, understood as such a massive loss of structural bone or a fracture through the anterior and posterior columns of the acetabulum that provokes a solution of continuity between the upper portion, ilium, and inferior, ischium, of the hemipelvis affected.

We present our experience in the treatment of a patient diagnosed with periprosthetic cup fracture, level 3B in Paprosky classification of acetabular bone loss, with

intrapelvic displacement of the same and associated vascular lesion.

Material and Methods: A 78-year-old woman, who underwent primary hip replacement in 2015, in another center, which required a replacement due to a pseudomonas aeruginosa infection, which was later resolved.

She was referred to our Centre for intrapelvic acetabulum with left external iliac artery aneurysm, which was a subsidiary of surgical intervention with stent placement by Vascular Surgery.

The extraction of the intrapelvic retentive cup and mesh was carried out.

The acetabular reconstruction ring, bone graft, dysplastic polyethylene and ceramic head were placed.

Results: In the immediate postoperative period, the patient presented anemia of 3 ml / g, needing 3 concentrates for stabilization. Angio-CT was performed to rule out active bleeding. She did not show signs of infection. The patient began walking after a month, currently needing two canes.

EVA scale of pain: Level 7. On the control X-rays after 3, 6 and 12 months, no displacement of the pelvic ring was observed, and the consolidation of the graft contributed was observed. The patient evolves favourably, without complications.

Comments and Conclusions: There are multiple ways of managing peri-prosthetic pelvic discontinuity.

Our treatment using acetabular ring for reconstruction plus allograft seems a good alternative for the treatment of this pathology with good clinical-functional and radiographic results.

INTRAPELVIC MIGRATION OF THE ACETABULAR COMPONENT: TOTAL HIP ARTHROPLASTY REVISION

Beatriz Fernández Maza, Marta Yáñez Hernández, Aurelio Moreno Velasco, Fernando Jáñez Moral, Jesús Campo Loarte

HOSPITAL UNIVERSITARIO PUERTA DE HIERRO, Madrid

Objectives: 56-year-old woman with aseptic mobilisation and intrapelvic cup migration undergoing a two-stage revision surgery. First, the Stoppa approach is used to extract the cup and stability is supplemented by a suprapectineal plate. The final components are then implanted by a lateral approach.

Material and Methods: 56-year-old woman with a history of rheumatoid arthritis undergoing immunosuppressive treatment, with total arthroplasty of both hips and

knees more than ten years ago. During follow-up, she presents with right-sided groin pain. An X-ray shows the loosening of the acetabular component with intrapelvic migration. The study is completed with CT, gammagraphy and tests, discarding an infectious component. After the corresponding preoperative plan, the right hip arthroplasty was replaced in two steps. The first step was the extraction of the acetabulum plus reinforcement by suprapectineal plate (Stryker®) using the Stoppa approach. The patient maintained a continuous soft traction of 6 kg until the second operation, performed after four days using the lateral approach. Stability of the rod is verified, and the femoral head is replaced by implanting a ceramic head of 32+0 mm. She presents with a Paprosky IIIb acetabular defect that is filled with bone allograft and a 60 mm trabecular metal cup (Zimmer®) is implanted, fixed with 7 screws. Polyethylene is cemented, with intraoperative stability being observed.

Results: In the immediate postoperative period, the patient presented with neuropraxia of the external popliteal sciatic nerve, which is currently undergoing resolution. Progressive support has begun with the right lower limb and she is in rehabilitative treatment with good evolution.

Conclusions: The extraction of an intrapelvic acetabular component may have a significant surgical risk as it could be associated with bleeding or pelvic organ damage. The modified Stoppa approach is an alternative approach that provides access to the anterior column and the quadrilateral acetabular surface through simple dissection and a low complication rate.

References

1. Stoppa Approach, An Alternative for Total Hip Arthroplasty in an Intra-Pelvic Cup Chana-Rodríguez, Francisco et al. The Journal of Arthroplasty, Volume 28, Issue 1, 198.e1 - 198.e4
2. Total hip arthroplasty revision in case of intra-pelvic cup migration: Designing a surgical strategy. Girard, J., Blairon, A., Wavreille, G. et al, Orthop Traumatol Surg Res. 2011;

CHANGES OF FEMORAL CENTER OF ROTATION IN BILATERAL TOTAL HIP ARTHROPLASTY

Beatriz Fernández Maza, Marta Yáñez Hernández, Aurelio Moreno Velasco, Fernando Jáñez Moral, Jesús Campo Loarte

HOSPITAL UNIVERSITARIO PUERTA DE HIERRO, Madrid

Objectives: Case of a 71-year-old woman undergoing total right hip arthroplasty (THA) at another hospital due

to coxarthrosis. Follow-up at our service for contralateral coxarthrosis. It was decided to perform total left hip arthroplasty maintaining the native centre of rotation, despite generating a lower limb dysmetria.

Material and Methods: A 71-year-old woman with a history of right THA who required replacement due to aseptic loosening more than 15 years ago at another hospital. Assessed at our surgery for left-sided coxarthrosis, with the physical examination showing 1-cm dysmetria in favour of the right lower limb. An X-ray shows a left coxa profunda, while the centre of rotation of the right THA is clearly descended. Surgical treatment was decided using total left hip arthroplasty, for which the corresponding preoperative plan was performed. In this case, and despite being unable to correct the dysmetria, it was decided to maintain the native centre of rotation of the hip. A Gryption® 56-mm cup with 3 screws and a 13-mm Corail® standard stem with a 32-mm ceramic head and +5-mm neck with good stability are implanted. In the immediate postoperative period, the patient did not present with complications derived from surgery.

Results: At 6 months of follow-up, she presented with a 100-0° flexion-extension joint with slight Trendelenburg, and a left lower limb length 2 cm less than the right one, so she uses a lift of 1 cm. She carries out everyday activities without difficulty and walks without technical aids.

Conclusions: Total hip arthroplasty sets out to restore normal biomechanics and preserve equal limb length without compromising stability. For this, it is essential to set the centre of rotation of the hip by properly positioning the components. In the case in question, it was decided to maintain the native centre of rotation of the left hip with a good functional result despite the residual dysmetria, which has been treated orthopaedically.

References

1. Changes of center of rotation and femoral offset in total hip arthroplasty. Bjarnason JA, Reikeras O. *Ann Trans Med.* 2015;3(22):355
2. Restoration of the centre of rotation in primary total hip arthroplasty: the influence of acetabular floor depth and reaming technique. G. Meermans, J. Van Doorn, J-J Kats *Bone Joint J.* 2016 Dec; 98-B(12): 1597–1603

FAT EMBOLISM IN TOTAL HIP ARTHROPLASTY. CASE REPORT

Bàrbara Nicolau Miralles, Ester Mora Solé, Guillem Figueras Coll, Juan Cabello Gallardo

Hospital Universitari Germans Trias i Pujol, Badalona, Barcelona

Objective: Embolization of fat and marrow contents results from the increase of intramedullary pressure generated during insertion of an intramedullary implant in total hip arthroplasty surgery. Embolization is accentuated when the implants are inserted using cemented techniques. These embolic events correlate with hemodynamic changes and can cause hypoxia, cardiopulmonary dysfunction or even death. The capacity to tolerate these changes depends on basal pulmonary function and the amount of embolisms liberated to circulation.

Methods: Female patient 77 years old, no drug allergies and comorbidities of hypertension, cerebrovascular accident, minor talasemia, Sjögren syndrome, that suffered a proximal femoral fracture subcapital Garden III. Surgical treatment was decided and a hybrid hip total arthroplasty implanted. During the surgery, while femoral canal's milling, the patient suffered a sudden desaturation until SaO₂ 88% and hypotension, that was partially recovered with inotropic support and orotracheal intubation was needed. Observed physical signs were petechiae in chest and arm-pits, paresia of upper extremities (muscular balance 2/5), without sensitivity alteration.

Results: Acute phase reactants within the normal range ruled out an exacerbation of Sjögren disease. No interstitial lesions were observed on chest radiograph, and angio-CT showed atelectasis. Fundus exploration was negative. Cranial CT showed multiple ischemic lesions and leukoaraiosis. Magnetic resonance imaging (MRI) showed extensive acute cerebral infarcts. Taking into account the clinical context of the episode of desaturation during spinal drilling and the appearance of petechiae, it was oriented as fat embolism syndrome. Respiratory function improved with supportive treatment, and motor symptoms with physiotherapy. At discharge, the patient had recovered the motor balance of the upper extremities up to 4/5, and saturation SaO₂ 95%.

Comments and conclusions: Fat embolisms release occurs during the preparation of femoral canal, both in cemented and uncemented arthroplasties. Regarding intraoperative prevention, the use of cannulated punches and rasps or the placement of an aspiration cannula along the rough line of the femur decreases the intramedullary pressure during the insertion of the stem and fat embolisms release, demonstrated by transesophageal ultrasound and cardiopulmonary monitoring.

Bibliography

Fukumoto E et al. Fat Embolism Syndrome. *Nurs Clin N Am* (2018) 533:35–347

Issack PS, et al. Fat embolism and respiratory distress associated with cemented femoral arthroplasty. *Am J Orthop* (2009) 38(2);72-6

Schmith J et al. Reduction of fat embolic risks in total hip arthroplasty using cannulated awls and rasps for the preparation of the femoral canal. *Arch Orthop Trauma Surg* (2000) 120(1-2):100-2

Pitto RP et al. Prophylaxis against fat and bone-marrow embolism during total hip arthroplasty reduces the incidence of postoperative deep-vein thrombosis: a controlled, randomized clinical trial. *J Bone Joint Surg Am* (2002) 84A(1):39-48.

Kim YH et al. Prevalence of fat embolisms following bilateral simultaneous and unilateral total hip arthroplasty performed with or without cement: a prospective, randomized clinical study. *J Bone Joint Surg Am* (2002) 84-A(8):1372-9.

USE OF POROUS TRABECULAR METAL AUGMENTS COMBINED WITH IMPACTION BONE GRAFTING IN ACETABULAR REVISION SURGERY: RESULTS AT SHORT TERM FOLLOW-UP

Cruz-Pardos A, García Rey E, Ortega-Chamarro J

Hospital Universitario La Paz, Madrid

Background: Impaction bone grafting for acetabular revision surgery has demonstrated excellent results at mid and long-term follow-up; however, in cases of large uncontained defects, cup migration can be observed. The use of porous trabecular metal augments combined with impaction bone grafting can be a viable alternative in these severe segmentary defects.

Objectives: We review the clinical and radiological results at short term follow-up relating to the use of porous trabecular metal augments combined with impaction bone grafting for the treatment of acetabular defects in acetabular revision surgery.

Material and Methods: This is a prospective study. Between 2012 and 2018, nineteen patients underwent cup revision with a tantalum augment combined with an impaction grafting technique. Bone defects were classified according to the Paprosky classification. Merlé-D'Aubigne-Postel was used to assess the clinical results. Patients were reviewed with X-rays and cup migration was assessed.

Results: 12 women and 7 men, with a mean age of 67 years (range, 45-90) were followed up for a mean of 39.5 months (range; 12-79). There were 3 type-2B, 5 type-2C, 7 type-3A and 3 type-3B Paprosky defects. The Merlé-D'Aubigne-Postel score improved from 8.55 to 15.66 ($p < 0.001$). We observed a correct cup position

and an adequate hip rotation centre. The distance to the centre of hip rotation improved from 22.23mm to 7.61mm ($p < 0.001$). Four cups were re-revised; two with type-3A and type-3B defects for loosening and another two cups due to recurrent dislocation. We did not observe radiolucent lines around the cups or allograft reabsorption in any case.

Conclusions: Impaction bone grafting combined with porous trabecular metal augments is a promising biological alternative technique to reconstruct large uncontained acetabular bone defects. The use of these augments could diminish the initial migration of the cups, although a longer follow-up is necessary to confirm these results.

Key words: tantalum, impaction grafting, acetabular revision.

ACETABULAR TECTOPLASTY IN PRIMARY TOTAL HIP REPLACEMENT

Ana Castel Oñate, Alfonso Vallés Purroy, Jorge Ojeda Levenfeld

Hospital Universitario Príncipe de Asturias, Alcalá De Henares, Madrid

Goals: Insufficient hip bone support due to dysplasia or erosion in its superior border, makes total hip replacement procedure very difficult.

The present paper reviews the results of patients in which a supplement of autograft was used to give better coverage to the cup of a total primary hip replacement.

Material and Methods: Patients in which augmentation tectoplasty in total hip replacement was performed, were reviewed. Clinical results (HHS), complication rate, graft survival and degree of resorption were analysed.

Results: A total of 30 total hip replacements were inserted in 27 patients (21 women) between 1999 and 2006. Diagnosis included: DDH 24 patients (10 dysplasia, 13 high dislocation and 1 low dislocation), 3 patients with necrosis and secondary erosion, and 3 hip osteoarthritis due to a dysplastic acetabulum. Mean age was 49 years (16-81). Mean follow-up was 9,2 years (2-18). In all of our cases a graft from the resected femoral head was screwed to the acetabulum. All cups used were non-cemented. Two femoral components were cemented. In three cases we needed to perform a femoral osteotomy.

Mean HHS score changed from 39 to 90. One acetabular loosening was observed which needed revision after 16 years and one chronic instability which needed revision after 5 years.

Our postoperative complications were: partial peroneal neuroapraxia in 3 cases, solved spontaneously, one major trochanter fracture, and one ischemic optical neuritis.

Partial resorption of the most external portion of the graft was observed in 17 hips (60%) with no clinical relevance.

Conclusions: Tectoplasty using femoral graft autograft is an effective technique with long-term good results. It allows an anatomical placement of the acetabular component of the hip replacement technique, preserving bone stock of the acetabulum.

COMPLICATIONS OF HIP ARTHROPLASTY IN HIV PATIENTS WITH INTRACAPSULAR HIP FRACTURE

Cruz E^a; Ramírez A^a; Cano JR^a; Guerado E^a; Rivas-Ruiz F^b

^aDepartment of Orthopaedic Surgery and Traumatology. Costa del Sol University Hospital. University of Málaga. Marbella, Málaga (Spain)

^bResearch Support Unit, Costa del Sol University Hospital. REDIDDEC. Marbella (Spain)

Introduction: In 2017, 3,381 cases of HIV were diagnosed in Spain, prevalence 8.82/100,000 inhabitants. Since the introduction of antiretroviral therapy in 1997, the life expectancy of patients with HIV has increased significantly and in consequence so has the risk of hip fracture. The main complications of this are deep infection and aseptic mobilisation.

Study aim: To evaluate risk factors in the development of complications in hip arthroplasty in patients with HIV and hip fracture, with respect to patients with HIV but no hip fracture.

Material and Method: Prospective historical cohort study of 17 patients with HIV who underwent hip arthroplasty 2009-2019. Group A: hip fracture + arthroplasty (n=4) Group B: no hip fracture + arthroplasty (n=13) Independent variables: epidemiological data, ASA score, Atlanta CDC classification, time since diagnosis, pre-postoperative CD4, pre-postoperative viral load, antiretroviral therapy, surgical indication(fracture/coxarthrosis -avascular necrosis, AVN). Dependent variables: hospital stay,surgical time,type of implant, complications(infection, dislocation,mobilisation,periprosthetic fracture, death, neurological injury, pulmonary embolism (PE), transfusion). Descriptive analysis using position measurements (median and interquartile range [P75-P25]for quantitative variables, frequency distribution segmented by diagnostic group.Bivariate analysis to evaluate inter-group differences, with the Mann-Whitney U test (Wilcoxon rank test of paired samples) for quantitative variables, and Fisher's exact test (or the McNemar test for paired samples) for qualitative variables. Level of statistical significance: p<0.05.

Results: 920 primary hip arthroplasties.682 fracture arthroplasties recorded over ten years,17 cases(1.06%) were affected by HIV. **Descriptive analysis** Group A(Hip Fracture+ Arthroplasty)

75% male and 25% female. Median age 61 years (51-74) and the average time elapsed since HIV diagnosis exceeded 21 years, in 75% of cases. ASA score (II25%; III75%). CDC classification (A0%; B25%; C75%). Antiretrovirals (2:0%; 3:100%; >=0%). Preoperative CD4: 839 (419-1375). Postoperative CD4:665 (338-1494). Median surgical time:110 min (70-131). Type of implant: in 100% of cases, cemented. Median hospital stay:15 days (5.5-33.5). Complications: PE0%, transfusion 50%, neurological injury0%,infection 25%,dislocation 0%, aseptic mobilisation 0%, periprosthetic fracture 0%, death 25%. Group B (No hip fracture+ Arthroplasty) 69.2% male and 30.8% female. Median age 54 years (49-62) and the average time elapsed since HIV diagnosis exceeded 21 years, in 46.2% of cases. ASA score (II53.8%; III46.2%). CDC classification (A38.5%; B30.8%; C30.8%)Antiretrovirals (2:25%; 3:66.7%; >=48.3%) Preoperative CD4: 549.50 (287-775) Postoperative CD4:638 (428-858) Surgical indication: 53.8% presented AVN. Median surgical time: 95 min (77-105) Type of implant: 69.2% non-cemented. Median hospital stay:3 days (2.5-5) Complications: PE0%, transfusion 15.4%, neurological injury 0%, infection 0%, dislocation 15.4%, aseptic mobilisation 7.7%, periprosthetic fracture 7.7%, death 7.7%

Bivariate analysis: The following significant inter-group statistical associations were observed: Mean hospital stay, greater in group A (fractures) (p=0.018). Type of implant, 100% of the cases in group A(fractures), cemented arthroplasties (p=0.029). Darunavir is related to an increase in the number of complications (p=0.018). No significant inter-group statistical association was observed for: Age (p=0.256) Sex (p=1.000) ASA score (p=0.576) Antiretroviral treatment (p=0.411) Use of darunavir and raltegravir (p=1.000) Duration of HIV (p=0.576) Preoperative CD4 (p=0.181) Postoperative CD4 (p=1.000) Surgical time (p= 0.39) Complications (transfusion p=0.219; infectionp=0.235; dislocation, fracture or mobilisationp=1.000; PE, neurological injury or death p= 0.426).

Conclusions: Significant differences were observed in hospital stay and the use of cementation in arthroplasty, which in both cases were higher in the "fracture" group(p=0.018;p=0.029).Darunavir was associated with a greater number of complications, in both groups(p=0.018) An inverse association, by diagnostic group, was observed. Thus, an increase in the postoperative CD4 count in group B "no fracture" was associated with a corresponding decrease in group A "fracture", although the difference was not statistically significant (p=1.000).

There are no conflicts of interests to report.

RISK FACTORS IN THE DEVELOPMENT OF COMPLICATIONS IN HIP ARTHROPLASTY IN PATIENTS WITH HIV

Ramírez A^a; Cruz E^a; Cano JR^a; Guerado E^a; Rivas-Ruiz F^b

^aDepartment of Orthopaedic Surgery and Traumatology. Costa del Sol University Hospital. University of Málaga. Marbella, Málaga (Spain)

^bResearch Support Unit, Costa del Sol University Hospital. REDIDDEC. Marbella (Spain)

Introduction: In 2017, 3,381 cases of HIV were diagnosed in Spain, prevalence of 8.82/100,000 inhabitants. Since antiretroviral therapy in 1997, life expectancy and the risk of avascular necrosis of patients with HIV has increased significantly. These two circumstances contribute to these patients' growing need for primary hip arthroplasty. The main complications in this process are deep infection and aseptic mobilisation.

Study aim to evaluate risk factors in the development of complications in hip arthroplasty in patients with HIV.

Material and method: Prospective study. Historical cohort of 13 HIV patients who underwent primary hip arthroplasty 2009-2019. *Independent variables:* epidemiological data, ASA score, Atlanta CDC classification, time since diagnosis, pre-postoperative CD4, pre-postoperative viral load, antiretroviral therapy, surgical indication (coxarthrosis/AVN). *Dependent variables:* hospital stay, surgical time, type of implant, complications (infection, dislocation, mobilisation, periprosthetic fracture, death, neurological injury, pulmonary embolism (PE), transfusion). Descriptive analysis using position measurements (median and interquartile range [P75-P25]) for quantitative variables, and of frequency distribution for qualitative variables. Bivariate analysis to evaluate inter-group differences for qualitative variables, using Fisher's exact test, with the Mann-Whitney U test for the case of one qualitative variable and one quantitative variable. Level of statistical significance: $p < 0.05$.

Results: 920 primary hip arthroplasties recorded over ten years, 13 cases (1.41%) were affected by HIV.

Descriptive analysis: 69.2% male and 30.8% female. The median age was 54 years (49-62) and median time elapsed since HIV diagnosis was 18 years (13-25). ASA score (II 53.8%; III 46.2%). CDC classification (A 46.2%, B 7.7%, C 46.2%). Antiretrovirals (2: 50%; 3: 41.7%; $> = 4$ 8.3%). Preoperative CD4: 549.50 (287-775); Postoperative CD4: 638 (428-858). Preoperative viral load > 20 (41, 7%) ≤ 20 (58.3%). Postoperative viral load > 20 (55.6%) ≤ 20 (44.4%). Surgical indication: 53.8% of patients presented AVN. Median surgical time: 95 min (77-105) Type of implant: in 69.2% of cases, non-cemented. Median hospital stay: 3 days (2.5-5). Complications: PE 0%, transfusion 15.4%, neurological

injury 0%, infection 0%, luxation 15.4%, aseptic mobilisation 7.7%, periprosthetic fracture 7.7%, death 7.7%.

Bivariate analysis: Significant increase in postoperative CD4 ($p=0.035$), higher in patients with preoperative viral load > 20 , without reaching statistical significance ($p=1.000$). No statistical significance was observed between complications and: Age ($p=0.165$) Sex ($p=1.000$) ASA score ($p=1.000$) Antiretroviral treatment, although 50% of patients treated with darunavir presented complications ($p=0.091$) Duration of HIV ($p=0.635$) Preoperative CD4 ($p=0.793$); Preoperative viral load ($p=0.152$) Surgical indication ($p=1.000$) Surgical time ($p=0.843$) Hospital stay ($p=0.919$) Type of implant ($p=1.000$). Although not statistically significant, there was a slight association between darunavir treatment and an increased risk of AVN (the four patients treated subsequently presented with necrosis $p=0.081$).

Conclusions: The cases analysed presented a significant increase in the postoperative CD4 count ($p=0.035$), which was higher in patients with preoperative viral load > 20 , although this association did not reach statistical significance ($p=1.000$). Darunavir was associated with the appearance of AVN ($p=0.081$), and with a higher number of complications ($p=0.091$), but without reaching statistical significance.

There are no conflicts of interests to report.

10 YEAR RESULTS WITH A CUP-CAGE SYSTEM IN SEVERE ACETABULAR DEFECTS AND PELVIC DISCONTINUITIES

Alfonso León, Ana Fraile, Berta Gasol, Rene Mauricio Gidi, Marc Tey, Fernando Marques

Parc de Salut Mar, Barcelona, Spain

Objectives: Clinical, radiological and functional result at 10 years with the Cup Cage reconstruction system in massive acetabular defects and pelvic discontinuities.

Material and Methods: Retrospective study of a consecutive series of 22 cases between 2009-2017. The Merlé d'Aubigné-Postel functional scale has been assessed preoperatively and postoperatively, radiographic migration of the implant, postoperative complications and reoperations.

Results: The average follow-up was 45.06 months (12 to 73 months), during which time there was any Cup-cage failure. At the end of the follow-up, there were 3 surgical re-interventions: a case of infection with debridement was performed and directed antibiotic treatment; second case due to a recurrent dislocation (2 episodes of dislocation) that was reoperated and replacing the polyethylene and the

head; and the third case with recurrent episodes of subluxation, without any episode of complete dislocation, which required the replacement of the polyethylene and the head due to poor orientation of the same since the initial surgery. No reoperation was performed due to loosening or migration in the Cup- Cage. Improvement was observed in the Postel Merle-D'Aubigné score from 6.91 to 14.36 and in the subcategory of the mobility score from 2.91 to 4.36 on the average of preoperative and postoperative values, respectively. With regard to postoperative radiological control, any case was mobilization or loosening of the Cup-Cage.

Conclusions: Acetabular reconstruction using Cup Cage is a useful alternative for the treatment of massive acetabular defects (Paprosky IIIB) and pelvic discontinuities in the medium and long term.

DOES LOCAL INTRAARTICULAR ANESTHESIA HAVE BENEFITS IN FAST TRACK HIP ARTHROPLASTIES PROGRAMS? A RANDOMIZED CONTROLLED TRIAL

Bartra A., Angles F., Novellas M., Cañete E., Miguela S

Hospital Universitari Mútua Terrassa

Background and Objectives: Fast-track (FT) programs evolved during the past 20 years reduces morbidity and enhances recovery for patients undergoing total hip arthroplasty (THA).

These FT programs have changed postoperative analgesic treatment to achieve an effective postoperative pain control allowing early postoperative mobilization.

Multimodal analgesic regimes including local intraarticular anaesthesia (LIA) have been successfully applied in these types of programs, however, methodological problems hinder the exact interpretation of previous trials, and the evidence of analgesic efficacy of LIA after THA remains to be clarified.

The aim of this study was to determinate the analgesic efficacy of LIA in THA surgery in a fast track program. The primary outcome were pain control using the Visual Analog Scale (VAS) at 4, 8, 12, 24 and 48 hours and the rescue analgesic consumption. Secondary outcomes included the time of first sitting, the time of first ambulation, the length of stay in hospital and complications.

Methods: Double-blind randomized controlled trial performed at a single university hospital centre during 2017 between two groups of patients included for THA with no significant differences in age, sex, ASA, Harris hip score, and pre-operative Hb level.

All patients received oral premedication of acetaminophen (1g) and celecoxib (200mg). Intraoperative, the patients were operated under spinal anaesthesia with 10-12 mg hyperbaric bupivacaine 0, 5%. They also received 8mg dexamethasone iv.

In one group of 32 patients was administrated LIA with 100 cc ropivacaine hydrochloride 0,2% and epinephrine 10micr/ml with 20cc of saline serum to complete a 120cc volume, and in the control group of 31 patients 120cc of saline serum.

Surgery were performed by the same surgical team. LIA or placebo was injected in a standardized manner, 40cc in the capsule and gluteus muscles, 40 cc in the rotators and ili-otibial tract, and 40 cc subcutaneous.

The patients followed the standardized fast-track program at our institution and were mobilized in the specialized hip arthroplasty unit. Multimodal oral analgesia was given to all patients; acetaminophen (1g/8h) and celecoxib (200mg/12h). Morphine (sevedrol 10mg) was the analgesic rescue.

Results: No statistically significant differences were founded in mean pain scores in both groups at 4, 8, 12, 24 and 48 hours although LIA group had less pain.

There were also no statistical differences in the need of rescue analgesia in the first 24 hours (7.81mg in LIA group versus 7.74 mg in control group) nor in the 48 hours (3.19 mg vs 2.42 mg). At the time of sitting (LIA group 96.8 % in less than the first 4 hours, and in control group 96.7 %) or ambulation (after sitting, 75% in <4h in LIA group and 71% in control group) also there were no statistically significant difference. Finally, there were also no differences in length of hospital stay (2.53 days in LIA group vs 2.06 days in control group) or in the appearance of complications.

Conclusions: Local infiltration analgesic with ropivacaine and epinephrine did not provide any extra analgesic effect in Fast Track THA program with a multimodal analgesic regimen.

Key words: local infiltration analgesia (LIA). Pain relief. Total hip arthroplasty. Fast Track.

CONVERSION OF HIP ARTHRODESIS TO TOTAL HIP ARTHROPLASTY

Adrian Martin Martinez, Carmen Martinez Aznar, Mercedes Campoamor Gonzalez, Juan Jose Panisello Sebastia, Jesus Javier Mateo Agudo

HOSPITAL UNIVERSITARIO MIGUEL SERVET, Zaragoza

Background: Hip arthrodesis is a therapeutic alternative in patients with a high probability of total hip arthroplasty (THA) failure. Possible pathologies such as hip infection including tuberculosis, pseudoarthrosis of femoral neck fractures or congenital hip dislocation. Well indicated, good results have been obtained. Functional impairment, pain and degeneration of the neighboring joints are frequent problems associated with a long-term arthrodesis hip.

There are situations that the conversion of arthrodesis to a THA provides substantial improvement of hip function and health-related quality of life, with an acceptable rate of complications.

Infiltración Methods: We describe a case, who at 25 years of age underwent hip arthrodesis for childhood hip

tuberculosis. Secondary genu valgo, groin pain and marked functional impairment prompted a decision to take down the arthrodesis.

Results: At last follow-up, 15 months after the THA procedure, the patient reported no pain. She had returned to her occupational and daily activities. She reported being very satisfied with the outcome.

Conclusions: Conversion THA is a challenging but successful procedure according to the mid-term clinical outcome observed. Prognostic factors should be used with caution when establishing indications and post-surgical expectations.

Keywords: Hip arthrodesis, Total hip arthroplasty, Conversion arthroplasty, Complications, Function.