

P64**Reconstruction of the femoral head with regenerative medicine in avascular necrosis: preliminary results.**D. Dallari¹, L. Amendola², C. Stagni³, L. Roseti⁴, B. Grigolo⁴, A. Facchini⁴, P. Fornasari⁴, A. Giunti³;¹Vii, Istituti Ortopedici Rizzoli, bologna, Italy, ²Vii, Istituti Ortopedici Rizzoli, Bologna, Italy, Italy, ³Vii, Rizzoli, bologna, Italy, ⁴Vii, rizzoli, bologna, Italy

Purpose: Avascular necrosis of the femoral head is a common problem, often leading to joint arthroplasty in young patients. We illustrate the preliminary results of an innovative surgical technique using various methods of regenerative medicine for the non-prosthetic treatment of high-grade necrosis of the femoral head (Stage III Arco) in patients under 45 years old, with the purpose of preserving the femoral epiphysis.

Methods and Materials: We used a technique that combines various methods: bioceramic cylinders (TruFit[®]Smith-Nephew) and lyophilized bone mixed with platelet gel and packed medullary cells; and engineered autologous cartilage on scaffold obtained from hyaluronic acid (Hyalograft[®]C, Fidia) to reconstruct the articular surface. Cartilage cell manipulation and quality control tests were performed inside the Rizzoli institute using a clean room and in accordance with GMP EU.

Results: Six months after the operation, and 3 months after weight bearing, the instrumental tests (CT and MRI) highlighted good preservation of the morphology of the femoral epiphysis and an initial reconstruction of the subchondral bone and the articular cartilage. From a biomechanical viewpoint in 3 cases out of 5 a functional limitation was caused by the incongruity of the articular surface and pain at the extremes of movement.

Conclusions: The preliminary results are presented of the first 5 cases of a study that will involve 20 patients for a 3-year duration. Considering the severity of the cases treated we are encouraged by the results and therefore consider the technique effective, although better results might be achieved with scaffolds that can recreate the spherical profile of the femoral epiphysis

P65**Hip chondral defects treated by arthroscopic autologous chondrocyte transplantation (ACT).**A. Fontana
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Purpose: Purpose of this study is to show the effectiveness of arthroscopically performed ACT as a treatment for hip chondral defects, compared to simple debridement.

Methods and Materials: From 2000 to 2005, 124 ACT have been arthroscopically performed in 124 patients affected by a chondral defect in the hip with heterogeneous etiopathogenesis. 3 different kind of scaffolds have been used. A controlled retrospective randomized study was carried out on 30 patients affected by a post-traumatic hip chondropathy of 3rd and 4th degree, according to the Outerbridge classification. 15 of these patients underwent arthroscopic ACT, while the other 15 underwent arthroscopic debridement. The two groups were similar in age, gender, degree and location of the chondral defect. In both groups, the average follow-up was 36.8 months (29 to 41). The mean size of the defect was 2.6 cm² (2 to 5.2). All the patients were assessed before and after the procedure with the Harris Hip Score.

Results: The patients that underwent an ACT improved significantly after the procedure, compared to the group that underwent a debridement. Unsatisfactory results in the first group were recorded in those patients where the chondral defect was located on the femoral head or where standard x-rays showed a reduced joint space.

Conclusions: Chondral defects located on the acetabulum can be treated by arthroscopic ACT. This study demonstrates the effectiveness of arthroscopically performed ACT as a treatment for chondral defects in the hip, compared to simple debridement.

P66**A comparison of conservative surgical management techniques to articular lesions of the femoral head.**

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Purpose: Traumatic injury to the hip can give rise to articular damage to the acetabulum, to the femoral head, or both. This articular damage can lead to arthritis and long term disability for patients especially if they are young. In this study we compared five surgical techniques for the biologic treatment of femoral head articular lesions.

Methods and Materials: A total of 12 patients with isolated femoral head articular defects were operated on over a period of three years with a follow up interval of 2-4 years. Eight patients had chronic articular defects and four patients had acute articular trauma with fracture instability. All eight chronic articular lesion patients failed microfracture technique. Biologic surgical treatment of the lesions was carried out with either, femoral osteotomy, allograft, autologous chondrocyte implantation, or Autogenous mesenchymal cell based technique. The approach was a modified trochanteric flip. A modification of the Pipkin classification was used to assess outcome.

Results: Microfracture technique for treating femoral head articular lesions was used in eight patients and was not effective or satisfactory. Proximal femoral osteotomy was used in 3 patients and had satisfactory results. Osteochondral reconstruction was used in two patients with satisfactory results. Autologous chondrocyte implantation was used in two patients with very satisfactory results. Periosteal flap with bone marrow grafting was used in five patients with very satisfactory results.

Conclusions: Outcomes at 4 years appear to favor cell based resurfacing techniques versus osteotomy. Microfracture technique is not an effective treatment for chondral or osteochondral defect of the femoral head. Complications rates were very.

P67**Microsurgical suture of the periosteal flap in autologous chondrocyte implantation: two to eight years follow-up study**J.H. Hui¹, E.H. Lee², Y.E.W. Ho³, S.C. Wang³, A. Dutton⁴, A. Lim⁵;¹Department Of Orthopaedic Surgery, National University of Singapore, Singapore, Singapore, ²Orthopaedic Surgery Department, Tissue Engineering Program, National University Singapore, Singapore, Singapore, ³Orthopaedic Surgery, National University Hospital, Singapore, Singapore, ⁴Orthopaedic Surgery, National University of Singapore, Singapore, Singapore, ⁵Hand And Reconstructive Microsurgery, National University Hospital, singapore, Singapore

Purpose: Medium term results of autologous chondrocyte implantation (ACI) report chondral graft hypertrophy and mechanical detachment of the periosteal patches used to enclose the chondrocytes. In an attempt to prevent these complications, we performed ACI with suture of the periosteal patch using nonabsorbable 8-0 continuous suture under loupe magnification.

Methods and Materials: 67 grade 3 and 4 chondral lesions in 60 patients (38 females and 22 males, mean age of 46.9) were treated with ACI and microsurgical periosteal patch sutures. Pre- and postoperative SF-36 and IKDC subjective knee scores were analyzed. Post-operative MRIs were performed in all knees at 9 months and 2 years post-operation. Second-look arthroscopies were performed in 30 knees.

Results: There were no re-operations or complications such as infection during the mean follow-up period of 52 months. There were significant improvements in the SF-36 domains for Physical Function, Bodily Pain, Physical and Emotional Role Functioning, as well as the IKDC score. The degree of improvement in these scores was correlated with the severity of preoperative scores, but not with size or location of lesion, etiology, gender or age. Arthroscopies and MRIs performed after surgery documented an absence of graft hypertrophy and periosteal detachment.

Conclusions: Suturing the periosteum with this technique may reduce the incidence of periosteal detachment in ACI.