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Treatment of articular cartilage lesions in the knee by perforations, stem cells and “autologous matrix induced chondrogenesis”: preliminary results
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Purpose: The authors report their experience in treating articular cartilage lesions in the knee by perforations, stem cells and autologous matrix induced chondrogenesis

Methods and Materials: From april 2006 to november 2006, 4 patients were treated with the method described in this paper using stem cells as augmentation. In 2 cases stem cells were drew by a peripheral blood aphaeresis after two days of stimulation with G-CSF and in the other two cases they were drew from the femoral autologous marrow blood through a mini-open.

Results: All patients well accepted the methodic, in all cases there was the total desaparece of pain between the 40 and 50 days after surgery. In one of these patient it was possible to perform a second arthroscopic look with histologic drawings that showed the presence of hyaline cartilage

Conclusions: we think that this technique is reliable and sure, our follow-up is short but the results are encouraging: we will go on with this study so that a longer follow-up will give us more security about the benefits of this technique.

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Autologous chondrocyte implantation and high tibial oseotom in the treatment of osteochondral defects in the malaligned knee
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Purpose: This study reports our institution’s experience of using autologous chondrocyte implantation with high tibial ostetomy in the treatment of osteochondral defects in the malaligned knee.

Methods and Materials: Thirteen patients with osteochondral defects and varus malalignment of the knee were reviewed as the basis of the study. Functional outcome was assessed using Modified Cincinnati Score, and the radiographs were assessed to see whether their neutral alignment was maintained.

Results: Eleven patients (eleven knees) were men and two patients (two knees) were women. The average age at surgery was 36 years (range 27-44). An average of three procedures per knee had been performed previously. The mean varus malalignment was 6 degrees (5° to 7°). Average duration of symptoms to time of surgery was 73 months. Preoperative Modified Cincinnati knee scores averaged 45 points (range 12 to 78). Patients were followed up an average of 12 months after surgery. At latest follow up, the average Modified Cincinnati knee score was 63 points (range 20 to 90). The patients maintained their corrected neutral to valgus alignment at latest follow up. There was one catastrophic failure; a smoker who had non-union at the osteotomy site, which was revised with iliac crest bone graft. This was subsequently complicated by infection and required removal of metalwork.

Conclusions: Mechanical joint overload such as in varus malaligned knees must be corrected for any soft tissue reconstruction (such as cartilage resurfacing) to succeed. Autologous chondrocyte implantation combined with high tibial osteotomy achieves this aim. Early follow up suggests improvement in functional clinical outcome measures.

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New method of vibro acoustical diagnosis of synovial joints characteristics; Preliminary results
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Purpose: Our study aims the set up of a new method of early articular cartilage damages diagnosis, involving mainly the superficial smoothness properties of joint surface. Smoothness of normal articular cartilage is progressively deteriorated during various stages of degradative pathological condition (osteoarthritis) or traumatic conditions. Articular joint surface progressively becomes uneven, fact that allows, during extreme joint movements (like flexion over 90 degrees), the production of articlar noise, “noise recording and mathematical computing method are leading to evaluation of articular cartilage surface smoothness.

Results: We found direct correlation between radiological osteoarthritis evaluation and sound recordings configuration in 27 of our cases.

Conclusions: Unlike different invasive or costly methods (like arthroscopy or MRI) the method is promising by being less expensive, totally non-invasive and in little time consuming, total investigation time (including hardware set up) is less than 5 minutes.

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Cartilage defect mapping: Tesla 3 MRI imaging with 3-D reconstruction vs. LED/Polaris-based Computer Assisted Surgery
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Purpose: To evaluate the efficacy of using Tesla 3 MRI and a LED/Polaris-based Computer Assisted Arthroscopy Software to determine the size and location of simple and complex chondral lesions on the femoral condyles of cadaveric human knees.

Methods and Materials: Simple and complex lesions were created on the femoral condyles of 11 freshly frozen human cadaver knees. Measurements of the defects were made arthroscopically with up to three users repeating the measurements after a common calibration. Measurements of interest were width, height, circumference, area, minimal distance to notch (MDTN) and minimal distance to condyle (MDTC). MR images of the knees were acquired using isovoxel techniques, which allowed the images to be reconstructed into any 2D plane with minimal distortion. The above measurements were made and repeated three times on a imaging software workstation. Lastly, the cadaver knees were opened up and disarticulated. Area and circumference were calculated based on the diameter of the plug harvesters. The area was calculated mathematically based on the geometric shape of the lesions. The actual distance of the defects relative to the notch and border of the condyles were measured with a caliper.

Results: For simple lesions MRI was more accurate (P<0.01). For complex lesions, arthroscopy appeared to be better in all categories except height. However, with the exception of MDTN (p=0.01), differences were not statistically significant (p>0.12).

Conclusions: Height, width, and circumference are fairly accurate under both systems and both methods appear to yield reasonably comparable results. Both methods are improvements over „freehand“ arthroscopy measurements.