

P84**Safety and efficacy results of a multi-center study of 432 patients undergoing autologous chondrocyte transplantation using a novel biphasic matrix**J. Koh¹, C. Gaissmaier², J. Fritz³;¹Orthopaedic Surgery, Northwestern University, Chicago, Illinois, United States of America, ²Cell, T-Tec, Tubingen, Germany, ³Trauma Surgery, Hospital for Workers Compensation, Tubingen, Germany**Purpose:** We describe a large multicenter study on the safety and efficacy results of autologous chondrocyte transplantation using a novel biphasic collagen matrix.**Methods and Materials:** Patients with large (> 3 cm) isolated articular cartilage defects were treated with autologous chondrocytes seeded onto a novel biphasic collagen matrix consisting of a deep spongy layer and a robust superficial layer. The seeded 3-dimensional matrix allows constant cell density and a stable environment for chondrocyte proliferation. Patients were followed to determine adverse effects; IKDC scores were prospectively gathered from a subgroup followed for a minimum of 2 years.**Results:** Patients undergoing matrix-based chondrocyte implantation demonstrated significant improvements in pain and function scores with minimal postoperative morbidity. 96.7% followup was achieved for patients for the safety study. These patients demonstrated a very low complication rate with 7.4% undergoing repeat arthroscopy, 0.5% (2 patients) undergoing repeat transplantation, and 0.24% (1 patient) total knee arthroplasty. Prospectively gathered minimum 2 year followup data for 78 patients (mean defect size 5.8 cm²) demonstrated significant improvements in IKDC scores from 39.5 to 56.8. Biopsies demonstrated hyaline-like articular cartilage.**Conclusions:** This multicenter study demonstrates that matrix based ACT allows the treatment of uncontained defects and can reliably deliver and maintain chondrocytes. The novel biphasic nature of the matrix provides a stable environment for chondrocytes while the superficial layer resists tangential forces. This technology can result in stable hyaline-like cartilage and reliably decreases pain and improves function.**P85****MACI-sandwich technique at the knee using a bilayer collagen membrane with bone graft for OCD. A case report. Preliminary results**S. Alevrogiannis, A. Triantafyllopoulos, G. Skarpas;
Orthopaedic Surgery, Athens General Clinic, Athens, Greece**Purpose:** To present our experience in using autologous cartilage implantation with a bilayer collagen membrane and bone graft, in a young patient with a deep osteochondral lesion at his knee, due to OCD.**Methods and Materials:** A 25 year old gentleman was presented to our clinic with an OCD lesion of the lateral femoral condyle-trochlea area at his right knee. The lesion (Outerbridge IV), was measuring 4x3 cm² and more than 10mm in depth. He underwent a two-stage matrix-induced autologous chondrocyte implantation (MACI) technique. The MACI membrane consists of a porcine type I/III collagen bilayer seeded with chondrocytes. A human allograft mixed with DBM was used for refilling the bone defect, following subchondral bone drilling. A bilayer membrane was placed over that, sealed with fibrin glue and the chondral defect was covered by a MACI membrane with the chondrocytes seeded on it. This membrane was put in place using sutures for safety reasons. The procedure was completed with a lateral release for patellar maltracking.**Results:** We assessed the patient at six months post-operatively using the modified Cincinnati knee and the visual analogue pain scores. The clinical outcome was excellent. No significant graft-associated complications were observed.**Conclusions:** Our early results of MACI-sandwich technique is encouraging, although larger medium-term studies in more cases are required, before there is widespread adoption of the technique.**P86****Does early preoperative osteoarthritis affect the outcome after autologous chondrocyte implantation?**P.K. Jaiswal¹, D. Park², M. Jameson-Evans², R. Carrington², J. Skinner², T. Briggs², G. Bentley²;¹The Joint Reconstruction Unit, The Royal National Orthopaedic Hospital, London, United Kingdom, ²Joint Reconstruction Unit, Royal National Orthopaedic Hospital, London, United Kingdom**Purpose:** We attempted to identify whether patients with early evidence of osteoarthritis (OA) on their pre-operative radiographs were associated with poorer outcomes after Autologous Chondrocyte Implantation (ACI).**Methods and Materials:** We retrospectively reviewed radiographs of 94 consecutive patients who underwent ACI and had already had their knee function assessed according to the Modified Cincinnati Score 2 years following surgery. Changes were graded according to The Kellgren and Lawrence (K&L) and the Stanmore grading system. Two independent observers analysed the films to assess the reproducibility and accuracy of these grading systems for assessment of OA in the knee.**Results:** Patients were divided into 2 groups; Group A were patients with excellent/good outcome (52 patients), those with fair/poor outcome were Group B (42 patients). 13 patients in Group A and 21 patients in Group B had radiographic evidence of OA (p<0.025). In 34 patients who had OA (mean age 33.6) the increase in Cincinnati score following surgery was minimal (33.5 to 37.5). In 60 patients where there was no evidence of OA (mean age 33.7) the score increased from 40 to 53.4. The inter-observer variation was greater using K&L (Kappa=0.31) compared with the Stanmore grading systems (Kappa=0.72).**Conclusions:** Patients with early radiographic evidence of OA are unlikely to gain maximum benefit from ACI. Furthermore, we recommend the use of Stanmore grading system for the assessment of OA as it is more reproducible than the K&L grading system.**P87****Quantitative T2 mapping of matrix-associated autologous chondrocyte transplantation at 3T: an in vivo cross-sectional study**S. Trattning¹, T.C. Mamisch², C. Glaser³, P. Szomolanyi⁴, S. Gebetsroither⁴, O. Stastny⁵, W. Horger⁶, S. Marlovits⁷;¹Department Of Radiology, MR Center for High field MR, Vienna, Austria, ²Orthopaedic Surgery, Inselspital, University of Berne, Berne, Switzerland, ³Institut Für Klinische Radiologie, Ludwig-Maximilians-Universität, Vienna, Austria, ⁴Department Of Radiology, Mr Center – Highfield Mr, Medical University of Vienna, Vienna, Austria, ⁵Medizinische Radiologie, Diagnostik Und Intervention, Zentralklinikum St.Pölten, St.Pölten, Austria, ⁶Medical Solutions, Siemens Medical Solutions, Erlangen, Germany, ⁷Vienna, Austria**Purpose:** To evaluate MR T2 mapping for characterisation of cartilage repair tissue following matrix associated autologous cartilage transplantation (MACT)**Methods and Materials:** Fifteen patients were evaluated following MACT using a 3T MR scanner. Patients were categorised into two postoperative intervals: I: 3-13 months, II: 19-42 months. Mean T2 relaxation times calculated from multiple spin-echo sequence were determined in regions of interest (MACT and normal hyaline cartilage) and T2 line profiles through the repair tissue and control sites were acquired.**Results:** Mean global T2 values of repair tissue in group I were significantly higher than at control sites (p<0.05). Repair tissue in group II showed no significant difference to control sites. Repair tissue T2 line profiles normalised over time toward the control sites.**Conclusions:** T2 mapping allows visualisation of cartilage repair tissue maturation. Global T2 repair tissue values approach that of control sites after more than 1 ½ years, similar behaviour is seen in the zonal organisation.