

Transplantation of Adipose-Derived Mesenchymal Stem Cells for Ankle Articular Cartilage Focal Lesions

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Summary:

The use of MSCs for ankle focal cartilage lesions, a safe and promising procedure

Abstract:

Purpose: Aim of this pilot prospective study was to evaluate the results of transplantation of adipose-derived mesenchymal stem cells for the treatment of focal ankle chondral lesions.

Material and Methods: Six patients (male:female 2:4), mean aged 28.67 (18-42 years), having 6 ICRS grade 3 and 4 focal ankle chondral defects were included. Medial malleolar osteotomy was performed in four patients having a posteromedial talar lesion. One patient with an anteromedial talar lesion and another having a tibial plafond lesion underwent an all-arthroscopic procedure. This single-staged procedure included filling of each defect with autologous culture-expanded mesenchymal stem cells, isolated from abdominal subcutaneous fat and embedded in a trimmed-to-fit commercially available biodegradable matrix. Patients were evaluated using the Foot and Ankle Outcome Score (FAOS) scale at 1st, 3rd, 6th, 12th and 24th p.o. month (mean 17.5 months). The non-parametric Wilcoxon Signed Rank test was used to determine significant differences between preoperative and postoperative values ($p < 0.05$). In addition the patients underwent MRI (3 Tesla) at the 12th and 24th p.o. month using the Magnetic Resonance Observation of Cartilage Repair (MOCART) scoring system.

Results: No complications or adverse events were reported. All six patients were found to be satisfied. A significant increase in mean values of all FAOS subscales was found, whereas the total FAOS improved from 32.8 to 78.6, $p = 0.05$. The MOCART score revealed significant development of tissue resembling the healthy cartilage.

Conclusions: Treatment of focal ankle chondral lesions with this single-staged cell-based technique demonstrated promising preliminary results, according to relevant outcome scores. It is needed longer follow up period and larger patients number in order to reach safer results for the effectiveness of this treatment option.