Matrix Induced Autologous Chondrocyte Implantation of Talus Articular Defects: Two Year Prospective Study

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Summary:
This investigation group concludes that MACI represents a revision treatment for osteochondral defects greater than 1cm² of the talus in patients who do not respond to initial curettage and microfracture. Restorative cartilage treatments like MACI should be considered for larger lesions that fail to improve six months after initial arthroscopy and microfracture.

Abstract
Background:
Osteochondral injury of the talus can be a challenge to treat because articular cartilage has a poor intrinsic reparative capability. Ankle arthroscopy is an effective means for diagnosis and treatment of osteochondral lesions of the talus, with up to 86% of patients improving after arthroscopic drilling or curettage.[1] However, stimulative techniques result in fibrocartilage, leading to eventual breakdown with normal joint loading. Some studies have documented satisfactory results using osteochondral autograft/allograft, and autologous chondrocyte implantation (ACI).[2][3] (MACI) is the second generation of the traditional ACI procedure, using a type I/III bilayer collagen membrane seeded with cultured autologous chondrocytes.[4] The MACI technique requires a limited exposure of the joint without an osteotomy and allows for shorter operating.[5] This investigation reports on two year prospective results of ten patients with talar chondral defects using matrix-induced autologous chondrocyte implantation.

Methods:
A prospective investigation of MACI was performed on ten patients with full-thickness lesions of the talus. The patients included had a documented talus lesion on MRI, failure of conservative treatment and arthroscopic debridement/curettage, persistent ankle pain and swelling, the absence of tibiotalar arthritis and a stable ankle. Lesions were graded during the harvesting procedure using the Cheng-Ferkel grading system, the Outerbridge classification, and the International Cartilage Repair Society system. Clinical and functional evaluation was done pre-operatively, and at one and two years post-operatively using the AOFAS hindfoot evaluation and the SF-36 Health Survey.

Results:
Five males and five females, with an average of 1.7 previous procedures prior to Matrix-induced autologous implantation, were included in this study. All patients were available for follow up at one and two years. Preoperative AOFAS hindfoot scores were 61.2 (range 42-76) which statistically improved one year post-operatively to 74.7 (range 46-87) and remained stable at two years (Figure 1). The results of the SF36 evaluation demonstrated a significant improvement in the Physical Functioning (p=0.002) and Bodily Pain (p
Conclusions:
The results of this study suggest that MACI is an effective way to treat full-thickness lesions of the talus using harvested chondrocytes from the talus without malleolar osteotomy. This procedure is recommended for patients who do not respond to initial curettage and microfracture.

References: