Autologous Chondrocyte Implantation in Chondral Defects of the Knee with a Type I/III Collagen Membrane: A Prospective Study with a 3-year Follow-up

Reference:

Scientific Literature Review

Reviewed By: Fui Dawson, DPM
Residency Program: Beth Israel Deaconess Medical Center, Boston, MA

Podiatric Relevance:
Osteochondral lesions are frequently found in the ankle joint following traumatic dorsiflexion inversion or plantarflexion inversion injury. Occasionally OCD are also found in the 1st metatarsal head following traumatic events. A summary of prospective study outcomes of autologous chondrocyte implantation (ACI) with a collagen membrane in the knee is discussed thoroughly. These techniques may be applied successfully for treatment of OCD in the talus.

Methods:
This study was performed between 2000 and 2002 to determine the outcomes of autologous chondrocyte implantation at definite time intervals in a 36 month period. 63 patients with full thickness osteochondral lesions in the knee were underwent ACI and evaluated at 6, 18, 36 months after the surgery. The patients were divided into 3 different groups depending on the location of the chondral defect (femoral condyles, trochlea, and retropatellar). Patients with meniscal pathologies, axial malpositioning and ligamentous instabilities were excluded from the study. Following implantation, the chondrocyte implant within the lesion was covered with a type I/III collagen membrane. Preoperative scores (modified Cincinnati & international cartilage repair society score) were compared with follow up data using paired Wilcoxon test score.

Results:
There was no significant difference between the different defect localizations. There was significant improvement from baseline scores in all time intervals at 6, 18, 36 months. By using the collagen membrane, graft hypertrophy and associated symptoms were avoided.

Comments:
The authors have shown that autologous chondrocyte implantation is a viable method of treating isolated osteochondral defects in the knee. Although the ankle joint is much smaller than the knee joint, this technique may be employed successfully through a transmalleolar approach. This technique may be superior to that of a mosaicplasty as one would avoid graft hypertrophy or uneven joint surface following the transplant. The use of a collagen membrane also avoids the need to take periosteum from the tibia or another location. Drawbacks may include 4-5 weeks of culturing patient’s own chondrocytes. Further clinical studies would be necessary to encourage surgeons that (ACI) is promising and holds a position in foot and ankle surgery.