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Articular Cartilage Repair Using Marrow Stimulation Augmented with a Viable Chondral Allograft: 9-Month Postoperative Histological Evaluation

A novel product developed to augment traditional microfracture cartilage surgery. While new, it shows promise in allowing an "apples-to-apples" (Type II articular rather than scar) cartilage repair, which could improve long-term results in active patients. More case series/histology are needed. - Kelly Cunningham, MD

Case Report

Marrow stimulation is frequently employed to treat focal chondral defects of the knee. However, marrow stimulation typically results in fibrobrocartilage repair tissue rather than healthy hyaline cartilage, which, over time, predisposes the repair to failure. Recently, a cryopreserved viable chondral allograft was developed to augment marrow stimulation. The chondral allograft is comprised of native viable chondrocytes, chondrogenic growth factors, and extracellular matrix proteins within the superficial, transitional, and radial zones of hyaline cartilage. Therefore, host mesenchymal stem cells that infiltrate the graft from the underlying bone marrow following marrow stimulation are provided with the optimal microenvironment to undergo chondrogenesis.

The present report describes treatment of a trochlear defect with marrow stimulation augmented with this novel chondral allograft, along with nine month postoperative histological results. At nine months, the patient demonstrated complete resolution of pain and improvement in function, and the repair tissue consisted of 85% hyaline cartilage. For comparison, a biopsy obtained from a patient , 9 months after treatment with marrow stimulation alone contained only 5% hyaline cartilage.

These outcomes suggest that augmenting marrow stimulation with the viable chondral allograft can eliminate pain and improve outcomes, compared with marrow stimulation alone.

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