

## **Treatment of a full-thickness articular cartilage defect in the femoral condyle of an athlete with autologous bone-marrow stromal cells.**

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**OBJECTIVES:** Human bone-marrow stromal cells are believed to be multipotent even in adults. This study assessed the effectiveness of autologous bone-marrow stromal cells, which were embedded within a collagen scaffold, to repair a full-thickness articular cartilage defect in the medial femoral condyle of an athlete. **PATIENT AND METHODS:** A 31-year-old male judo player suffering from pain in the right knee was reviewed. A 20 x 30-mm full-thickness cartilage defect (International Cartilage Repair Society classification (ICRS) grade IV) was revealed in the weight-bearing area of the medial femoral condyle. With the informed consent of the patient, the defect was treated with autologous bone-marrow stromal cells. Bone marrow was aspirated from the iliac crest of the patient 4 weeks before surgery. After removing the erythrocytes, the remaining cells were expanded in culture. Adherent cells were collected and embedded within a collagen gel, which was transferred to the articular cartilage defect in the medial femoral condyle. The implant was covered with an autologous periosteal flap. **RESULTS:** Seven months after surgery, arthroscopy revealed the defect to be covered with smooth tissues. Histologically, the defect was filled with a hyaline-like type of cartilage tissue which stained positively with Safranin-O. One year after surgery, the clinical symptoms had improved significantly. The patient had reattained his previous activity level and experienced neither pain nor other complications. **CONCLUSIONS:** Our findings indicate that the transplantation of autologous bone-marrow stromal cells can promote the repair of large focal articular cartilage defects in young, active patients.