



March 13th, 2004  
AOSSM Specialty Day

## FUNCTIONAL OUTCOME OF KNEE ARTICULAR CARTILAGE REPAIR IN ADOLESCENT ATHLETES

### Authors:

1. Kai Mithoefer MD, Brigham and Women's Hospital, Boston, MA
2. Tom Minas MD, Brigham and Women's Hospital, Boston, MA
3. Howard Yeon MD, Brigham and Women's Hospital, Boston, MA
4. Lyle J. Micheli MD, Children's Hospital, Boston, MA

**Objective:** Limited information exists in the literature about cartilage lesions in adolescent athletes and their long-term effect on athletic activity. Particularly the treatment of young athletes who have failed multiple surgical procedures still presents a challenging problem.

**Methods:** We retrospectively evaluated knee function in 20 adolescent athletes with 23 full thickness articular cartilage lesions at up to 96 months after autologous chondrocyte transplantation. All athletes had had failed previous therapy.

**Results:** Mean patient age was  $16 \pm 0.3$  years (range 12-18 years). Average duration of symptoms was  $21 \pm 4$  months (range 5-60 months). Sixty-one percent had juvenile osteochondritis dissecans that did not respond to previous treatment. The athletes had undergone a mean of  $2.5 \pm 0.3$  (range 1-6) prior surgical procedures before chondrocyte implantation. Seventeen percent had associated meniscal injuries and 4% presented with tears of the anterior cruciate ligament. A mean of 1.5 (range 1-3) defects were observed, with 71% single articular lesions. Cartilage defects were located in the medial femoral condyle (57%), lateral femoral condyle (28%), trochlea (19%), tibial plateau (9%), and patella (9%). Average lesion size was  $6.6 \pm 1$  cm<sup>2</sup> (range 2-14 cm<sup>2</sup>). At the latest follow-up  $47 \pm 4$  months after chondrocyte implantation 96% of athletes reported good or excellent results. Lysholm scores averaged  $81 \pm 7$  points. Tegner-Wallgren activity scores significantly improved from 4 to 8 points ( $P < 0.001$ ). Ninety-six percent of patients were able to regularly participate in high-impact, pivoting sports. Fifty-seven percent of adolescents had returned to the same or higher athletic activity level than before their injury. There was no statistical correlation between lesion size, age, duration of symptoms and functional status at follow-up.

**Conclusions:** Treatment of full-thickness articular cartilage injuries of the knee in adolescent athletes with autologous chondrocyte transplantation provides a reliable and durable cartilage repair with significant improvement of functional status and frequent ability to return to demanding athletic activities.