

A Comparison of 2-Year Outcomes in Patients Undergoing Tibiofemoral or Patellofemoral Matrix-Induced Autologous Chondrocyte Implantation

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BACKGROUND

Matrix-induced autologous chondrocyte implantation (MACI) has demonstrated encouraging clinical results in the treatment of knee chondral defects. However, earlier studies suggested that chondrocyte implantation in the patellofemoral (PF) joint was less effective than in the tibiofemoral (TF) joint.

PURPOSE

To compare the radiological and clinical outcomes of those undergoing MACI to either the femoral condyles or PF joint.

STUDY DESIGN

Cohort study; Level of evidence, 3.

METHODS

A total of 194 patients were included in this analysis, including 127 undergoing MACI to the medial ($n = 94$) and lateral ($n = 33$) femoral condyle, as well as 67 to the patella ($n = 35$) or trochlea ($n = 32$). All patients were evaluated clinically (Knee injury and Osteoarthritis Outcome Score [KOOS], visual analog scale, Short Form-36) before surgery and at 3, 12, and 24 months after surgery, while magnetic resonance imaging (MRI) was undertaken at 3, 12, and 24 months, with the MOCART (magnetic resonance observation of cartilage repair tissue) scoring system employed to evaluate the quality and quantity of repair tissue, as well as an MRI composite score. Patient satisfaction was evaluated.

RESULTS

No significant group differences ($P > .05$) were seen in demographics, defect size, prior injury, or surgical history, while the majority of clinical scores were similar preoperatively. All clinical scores significantly improved over time ($P < .05$), with a significant group effect observed for KOOS activities of daily living ($P = .008$), quality of life ($P = .008$), and sport ($P = .017$), reflecting better postoperative scores in the TF group. While the PF group had significantly lower values at baseline for the KOOS activities of daily living and quality of life subscales, it actually displayed a similar net improvement over

time compared with the TF group. At 24 months, 93.7% (n = 119) and 91.0% (n = 61) of patients were satisfied with the ability of MACI to relieve their knee pain, 74.0% (n = 94) and 65.7% (n = 44) with their ability to participate in sport, and 90.5% (n = 115) and 83.6% (n = 56) satisfied overall, in the TF and PF groups, respectively. MRI evaluation via the MOCART score revealed a significant time effect (P < .05) for the MRI composite score and graft infill over the 24-month period. While subchondral lamina scored significantly better (P = .002) in the TF group, subchondral bone scored significantly worse (P < .001). At 24 months, the overall MRI composite score was classified as good/excellent in 98 TF patients (77%) and 54 PF patients (81%).

CONCLUSION

MACI in the PF joint with concurrent correction of PF maltracking if required leads to similar clinical and radiological outcomes compared with MACI on the femoral condyles.

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