

Minimum 10-Year Outcomes of Matrix-Induced Autologous Chondrocyte Implantation in the Knee: A Systematic Review

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INTRODUCTION: Matrix-induced autologous chondrocyte implantation (MACI) is an established cell-based therapy for the treatment of chondral defects of the knee. As long-term outcomes are now being reported in the literature, it is important to systematically review available evidence to better inform clinical practice. The purpose of this systematic review was to report: 1) subjective patient-reported outcomes (PROs), and 2) the rate of graft failure, reoperation, and progression to total knee arthroplasty (TKA) after undergoing MACI of the knee at a minimum 10-year follow up.

METHODS: A comprehensive search of Ovid MEDLINE(R) and Epub Ahead of Print, In-Process and Other Non-Indexed Citations, and Daily, Ovid EMBASE, Ovid Cochrane Central Register of Controlled Trials, Ovid Cochrane Database of Systematic Reviews, and Scopus from 2008 to September 15, 2022, English language, was conducted. Study eligibility criteria included 1) full-text articles in the English language, 2) patients undergoing a MACI within the knee, 3) reported clinical outcomes, and 4) had minimum 10-year follow up.

RESULTS: One-hundred-sixty-eight patients (99 males, 69 females; mean age: 37 years [range, 15-63]; BMI: 26.2 kg/m² [range, 18.6-39.4]) representing 188 treated chondral defects at a minimum of 10 years follow up after MACI were included in this review. Significant and durable long-term improvements were observed across multiple patient-reported outcome measures. Follow-up magnetic resonance imaging, when performed, also demonstrated satisfactory defect fill and an intact graft in the majority of patients (73.9%). All-cause reoperation rate was 9.0% with an overall 7.4% rate of progression to TKA at 10-to-17-year follow up.

DISCUSSION AND CONCLUSION: At minimum 10-year follow up, patients undergoing MACI for knee chondral defects demonstrated significant and durable improvements in PROs, satisfactory defect fill on MRI-based assessment, and low rates of reoperation and TKA. This data supports the use of MACI as a long-term treatment of focal cartilage defects of the knee.