## Prior Cartilage Procedures Are Associated with Higher Risk of Manipulation and Revision After Total Knee Arthroplasty

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INTRODUCTION: Cartilage restoration procedures such as microfracture, chondroplasty, osteochondral autograft or allograft transplantation, and autologous chondrocyte implantation are frequently employed to delay the need for total knee arthroplasty (TKA) in patients with focal chondral lesions. However, the long-term influence of prior cartilage surgery on outcomes after eventual TKA remains unclear. This study aimed to assess whether a history of cartilage surgery is associated with increased rates of complications, revision, and manipulation under anesthesia (MUA) following TKA.

METHODS: A retrospective cohort study was conducted using the TriNetX Research Network. Patients who underwent TKA following prior cartilage procedures (n=4,356) were identified via CPT and ICD-10 codes and matched 1:1 to patients undergoing primary TKA without prior cartilage surgery, controlling for age, sex, BMI, race, diabetes, nicotine dependence, heart disease, heart failure, CKD, and COPD. Outcomes were assessed at 90 days, 2 years, and 5 years postoperatively. Primary outcomes included rates of any adverse event, revision TKA, and MUA. Secondary outcomes included medical and surgical complications.

RESULTS: After matching, baseline demographics and comorbidities were well-balanced with $p < 0.05$ and SMD <0.2. At 90 days, patients with prior cartilage procedures had significantly higher rates of MUA (5.0% vs. 2.9%, $p<0.001$; OR 1.75). They had similar rates of overall adverse events and lower rates of sepsis (0.3% vs. 0.6%, $p=0.042$) and inpatient admission (7.8% vs. 9.0%, $p=0.049$). At 2 years, MUA remained more frequent in the cartilage group (7.0% vs. 3.9%, $p<0.001$; OR 1.84), as did DVT (3.1% vs. 2.3%, $p=0.025$; OR 1.34) and VTE (4.5% vs. 3.7%, $p=0.045$; OR 1.24). Revision TKA did not differ (2.9% vs. 2.5%, $p=0.259$). At 5 years, prior cartilage procedures were associated with significantly higher rates of MUA (7.4% vs. 4.4%, $p<0.001$; OR 1.74) and revision TKA (4.4% vs. 3.2%, $p=0.005$; OR 1.38).

DISCUSSION AND CONCLUSION: In this large matched cohort of 8,712 patients, a history of cartilage procedures prior to TKA was associated with significantly increased long-term risk of revision, MUA, thromboembolic events, and infection. While cartilage procedures may delay arthroplasty, they may also predispose patients to a more complex postoperative course. These findings should be considered in treatment planning for focal chondral defects and may inform preoperative counseling for patients anticipating future TKA.