Scoping Out the Risks: Arthrofibrosis and Failure After Total Knee Arthroplasty in Patients With Prior Arthroscopy

Alireza Mirahmadi, Jad Jack Lawand, Kaveh Momenzadeh, Mohamad Javad Shariati, Ara Nazarian

INTRODUCTION:

Knee arthroscopy (KA) remains widely performed for degenerative joint disease (DJD) despite limited evidence supporting its long-term efficacy in older adults with osteoarthritis. Although often used to manage meniscal tears, loose bodies, and mechanical symptoms, KA does not alter disease progression in advanced DJD and is frequently a temporizing measure before total knee arthroplasty (TKA). Emerging evidence suggests that KA performed shortly before TKA may predispose patients to postoperative complications, including joint stiffness and arthrofibrosis, which can ultimately compromise surgical outcomes.

Arthrofibrosis is a particularly challenging complication following TKA, often necessitating secondary interventions such as manipulation under anesthesia (MUA) or lysis of adhesions. These procedures increase healthcare utilization, cost, and patient morbidity. The biological plausibility of KA contributing to a pro-fibrotic intra-articular environment through synovial inflammation and tissue injury has raised concerns regarding its safety in the pre-arthroplasty window. However, high-quality evidence on this topic remains limited.

This study aims to determine whether undergoing KA within two years prior to TKA is associated with increased risk of postoperative complications, particularly those related to arthrofibrosis, using a large, real-world national database.

METHODS:

We conducted a retrospective cohort study utilizing the TriNetX Research Network, a federated multi-institutional database composed of de-identified electronic medical records across the United States. Adult patients (age ≥18) who underwent primary total knee arthroplasty between 2005 and 2025 were identified using standardized CPT and ICD-10 codes.

Patients were grouped based on whether they had a documented KA within two years prior to TKA. The exposure group included those with KA occurring up to 730 days before the index TKA procedure, and the control group comprised patients undergoing TKA without prior KA in that period.

Propensity score matching (1:1) was performed using age, sex, race, BMI, and relevant comorbidities (e.g., diabetes, rheumatoid arthritis, cardiovascular disease). After matching, each group consisted of 1,566 patients.

Primary outcomes included the incidence of Revision TKA, Manipulation under anesthesia (MUA), Lysis of adhesions, Periprosthetic joint infection (PJI), and Mechanical loosening

Outcomes were assessed over a 5-year postoperative follow-up window. Comparative analyses were conducted using chi-square tests for categorical variables. Odds ratios (OR) with 95% confidence intervals (CI) were reported. A P-value < 0.01 was considered statistically significant.

RESULTS:

After matching, prior KA was associated with a significantly increased risk of revision TKA (7.8% vs. 3.7%; OR 2.18, 95% CI 1.56–3.04; $p < 0.001$), MUA (4.1% vs. 2.5%; OR 1.67, 95% CI 1.11–2.50; $p = 0.012$), and lysis of adhesions (2.4% vs. 0.6%; OR 3.87, 95% CI 1.92–7.79; $p < 0.001$). Trends toward higher rates of PJI (4.8% vs. 3.7%) and mechanical loosening (2.1% vs. 1.5%) were observed but did not reach statistical significance.

DISCUSSION AND CONCLUSION:

Knee arthroscopy within two years prior to TKA is significantly associated with increased rates of revision surgery, MUA, and lysis of adhesions—all of which are key indicators of arthrofibrosis. These findings underscore the importance of considering the fibrotic potential of prior arthroscopy in surgical planning. For patients with degenerative knee disease who are likely to require arthroplasty, avoiding arthroscopy may reduce postoperative complications and improve long-term outcomes. Greater awareness of arthrofibrosis risk is critical, and future studies should explore biologic mechanisms and prevention strategies for optimizing care in this high-risk group.