Inflammatory Bowel Disease Is Associated with Increased Short- and Long-Term Complication Risk Following Total Knee Arthroplasty

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INTRODUCTION:

Total knee arthroplasty (TKA) is a highly effective procedure for alleviating pain and improving function in patients with advanced knee osteoarthritis. However, systemic inflammatory conditions such as inflammatory bowel disease (IBD) — which includes Crohn's disease and ulcerative colitis — may adversely affect surgical outcomes. IBD is associated with chronic immune activation, altered bone metabolism, and increased thromboembolic risk, all of which may contribute to complications in the perioperative period and beyond.

While IBD has been linked to adverse outcomes in other surgical settings, its specific impact on TKA has not been well characterized. This study aimed to evaluate whether patients with IBD experience increased short-term and long-term complication rates following TKA compared to matched controls.

METHODS:

We conducted a retrospective cohort study using the TriNetX Research Network, a federated database of deidentified electronic health records. Adult patients undergoing primary TKA between 2005 and 2025 were identified using ICD-10 and CPT codes. Two cohorts were created: patients with a diagnosis of IBD and those without. Propensity score matching (1:1) was performed to adjust for age, sex, race, and comorbidities as diabetes, as well as relevant medications.

Outcomes were assessed at two time points: 90 days and 5 years postoperatively. Short-term outcomes included hospital readmission, deep vein thrombosis (DVT), pulmonary embolism (PE), infection, and opioid use. Long-term outcomes included prosthetic joint infection (PJI), revision TKA, periprosthetic fracture, and long-term opioid dependence.

Comparative analyses were conducted using chi-square tests for categorical variables and independent t-tests for continuous variables. Odds ratios (OR) with 95% confidence intervals (CI) were calculated for each outcome. A two-sided P-value < 0.01 was considered statistically significant to account for the large sample size and reduce type I error.

RESULTS:

Following matching, 5,340 patients were included in each cohort. The mean age was 66.9 ± 9.6 years in the IBD group and 67.1 ± 9.5 years in the control group. The proportion of females was 61.6% in both groups. Mean BMI was 32.9 ± 5.4 in the IBD group and 34 ± 7 in the control group, indicating successful matching across key demographic and clinical variables (P > 0.05).

At 90 days postoperatively, patients with IBD had significantly higher rates of knee stiffness (6% vs. 4.6%; $P = 0.003$), emergency department (ED) visits (13% vs. 9.3%; $P < 0.001$), readmission (2% vs. 1.3%; $P = 0.009$), DVT (1.9% vs. 1.3%; $P = 0.01$), PE (1.6% vs. 0.8%; $P < 0.001$), and sepsis (1% vs. 0.5%; $P = 0.01$). Opioid use was also more common in the IBD group (88.8% vs. 85.5%; $P < 0.001$).

At 5-year follow-up, regarding prosthesis-related complications, patients with IBD experienced significantly increased rates of PJI (5% vs. 3.4%; $P = 0.01$); however, there were no differences regarding periprosthetic fracture, mechanical (aseptic) loosening, and revision TKA (P > 0.05). Regarding systemic complications, IBD patients showed significantly higher rates of liver failure, acute renal failure, and myocardial infarction (P < 0.01). However, the mortality rate was the same between the two groups (P > 0.05). Long-term opioid use was significantly higher in the IBD group (97.2% vs. 94.2%; $P < 0.001$), and the rate of opioid abuse was also significantly higher in this group (1.2% vs. 0.4%; $P = 0.01$).

DISCUSSION AND CONCLUSION:

This study demonstrates that patients with inflammatory bowel disease face significantly greater risk of both perioperative and long-term complications following total knee arthroplasty, including increased rates of prosthetic joint infection, systemic organ dysfunction, and sustained opioid use. These findings highlight the need for tailored perioperative strategies in this population, including multidisciplinary management, vigilant postoperative monitoring, and proactive mitigation of infection and thromboembolic risks. Clinicians should also consider more aggressive risk assessment and opioid stewardship in patients with chronic inflammatory conditions. Future research is warranted to explore underlying mechanisms—such as immune dysregulation and gut-joint axis pathways—and to develop optimized care pathways that improve outcomes in this vulnerable group.