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General

Inflammatory Bowel Disease Is Associated With Persistent Functional Impairment and Increased Short- and Long-Term Complications Following Total Knee Arthroplasty

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Background

Inflammatory bowel disease (IBD) is increasingly prevalent, and more affected patients are undergoing total knee arthroplasty (TKA). However, the effect of comorbid IBD on short- and long-term postoperative outcomes after TKA remains incompletely defined, particularly for functional and implant-related complications. Existing TKA-specific literature has not clearly established whether this risk persists across multiple postoperative time points.

Methods

We performed a retrospective cohort study using the TriNetX Research Network. Adults undergoing primary TKA were identified and stratified by IBD status. Propensity score matching (1:1) balanced demographics and comorbidities, yielding 6134 patients per cohort. Outcomes were assessed at 90 days, 6 months, 2 years, and 5 years and included infectious, thromboembolic, medical, functional, and implant-related complications. Risk ratios with 95% confidence intervals were calculated for each endpoint. Matched cohorts were followed longitudinally across four predefined postoperative intervals after surgery.

Results

Patients with IBD demonstrated significantly increased risks of sepsis, pulmonary embolism, acute kidney failure, and periprosthetic joint infection/deep surgical site infection as early as 90 days. Several risks persisted through 5 years, including thromboembolic events, ischemic stroke, fall risk, abnormal gait, and implant failure. At 5 years, revision TKA rates did not differ significantly between cohorts despite the greater complication burden observed in patients with IBD.

Conclusions

Preoperative IBD was associated with sustained postoperative morbidity after TKA, spanning infectious, thromboembolic, functional, and implant-related domains. These findings support enhanced perioperative optimization, closer long-term surveillance, and targeted management strategies for this high-risk population.

INTRODUCTION

Inflammatory bowel disease (IBD), which includes Crohn's disease (CD) and ulcerative colitis (UC), is a chronic autoimmune-mediated condition.[1,2] In the United States, the prevalence of IBD is rising, affecting over 3 million individuals.[1] As life expectancy continues to rise and medical therapies advance, more patients with IBD are presenting for elective orthopedic procedures, including total knee arthroplasty (TKA).[3-5] TKA is a highly effective procedure that alleviates pain and restores functional ability; however, adverse outcomes such as periprosthetic joint infection (PJI) and revision surgery continue to impose substantial clinical and economic burdens.[4,6] The overall demand for TKA is increasing with the aging population, underscoring the need to better characterize postoperative risks in patients with IBD undergoing this procedure.[3,4]

Beyond intestinal inflammation, IBD has been associated with extraintestinal manifestations, with musculoskeletal involvement among the most commonly documented.[1,2,7] Peripheral arthritis, axial spondyloarthropathy, and chronic systemic inflammation contribute to progressive joint degeneration and functional impairment, necessitating surgical intervention.[2,5,7] Patients with IBD undergoing total joint arthroplasty experience higher rates of postoperative complications than non-IBD cohorts.[5,8-11] In the setting of TKA, increased rates of periprosthetic joint infection, thromboembolic events, blood transfusions, and readmissions have been reported.[5,8-10,12,13] Larger database studies and meta-analyses demonstrate elevated risks of both medical and surgical complications in patients with IBD.[9,10,14]

Despite growing awareness of these risks, the literature remains inconsistent, with variability in complication rates, disease subtype, severity, and evaluation of TKA-specific perioperative risk factors.[5,8-11,14] Furthermore, while total hip arthroplasty outcomes in IBD have been extensively explored, TKA-specific data, particularly regarding short-term and long-term complications, remain comparatively limited.[11,14] A more comprehensive understanding of risk profiles in IBD patients is essential for optimizing perioperative management and improving surgical outcomes.

Given these limitations in the existing literature, the purpose of this study was to evaluate how preoperative IBD influences the risk of short-term (90-day and 6-month), mid-term (2-year), and long-term (5-year) complications after primary TKA. Utilizing a large, multi-center electronic health record network and employing propensity score matching to balance potential confounders, we compared key outcomes, including PJI, revision TKA, and venous thromboembolism, between patients with and without IBD.

METHODS

STUDY DESIGN AND DATA SOURCE

This retrospective cohort study evaluated the impact of preoperative IBD on postoperative outcomes following primary TKA using de-identified electronic health records. Data were obtained from the TriNetX Research Network (TriNetX LLC, Cambridge, MA), a federated platform that aggregates longitudinal EHR data from over 100 U.S. healthcare organizations. The platform enables cohort construction and outcome identification using standardized terminologies, including ICD-10-CM, CPT, and SNOMED-CT. Because only de-identified, aggregated data were used, this study was exempt from Institutional Review Board oversight.

PARTICIPANTS

Adults aged 18 to 100 years undergoing primary TKA were identified using CPT code 27447 and corresponding ICD-10-PCS/SNOMED codes (e.g., 0SRC0J9, 0SRD0J9, 19063003). The IBD cohort included patients with a documented diagnosis of CD (ICD-10-CM: K50) or UC (ICD-10-CM: K51) on or before the index TKA. The control cohort comprised patients undergoing primary TKA without any history of IBD (K50-K51).

PROPENSITY SCORE MATCHING

To reduce confounding, 1:1 propensity score matching (PSM) was performed using the TriNetX platform's logistic regression and nearest-neighbor matching algorithms. Before matching, 6,208 patients with IBD and 495,828 without IBD were identified. After matching, each cohort included 6,134 patients. Matching variables included demographics (age at index TKA, sex, race [White, Black or African American, Asian, Native Hawaiian or Other Pacific Islander, Other Race], and ethnicity [Hispanic or Latino, Not Hispanic or Latino]), comorbid conditions (hypertensive diseases [I10-I1A], chronic kidney disease [N18], diabetes mellitus [E08-E13], overweight/obesity [E65-E68], ischemic heart disease [I25], heart failure [I50], liver disease [K70-K77], and tobacco use [Z72.0]), as well as body mass index (BMI). Following matching, baseline characteristics were well balanced, with all standardized mean differences (SMD) <0.1.

OUTCOMES

Postoperative complications were evaluated at 90 days, 6 months, 2 years, and 5 years following index TKA. Outcomes were defined using ICD-10-CM, CPT, and SNOMED-CT codes within TriNetX. Short-term outcomes included deep vein thrombosis (DVT), pulmonary embolism (PE), sepsis, acute kidney failure, ischemic stroke, periprosthetic joint infection/deep surgical site infection (PJI/Deep SSI), fall risk, and abnormal gait. Longer-term outcomes (2 years and 5 years) additionally encompassed revision TKA and implant failure. Patients were included in each risk analysis if the event occurred postoperatively, regardless of earlier complications.

STATISTICAL ANALYSIS

Statistical analyses were performed within TriNetX on the PSM cohorts. Baseline characteristics were compared pre- and post-matching using independent-samples t-tests, Pearson chi-squared tests, and SMDs. Risk ratios (RRs) and risk differences (RDs) with 95% confidence intervals (CIs) were calculated for each complication at 90 days, 6 months, 2 years, and 5 years. Statistical significance was defined as $p < 0.05$. For long-term outcomes, Kaplan-Meier survival curves and Log-Rank tests generated hazard ratios (HRs) with 95% CIs.

RESULTS

PATIENT COHORT IDENTIFICATION AND MATCHING

We identified 502,036 patients meeting eligibility criteria for primary TKA within the TriNetX Research network. Before PSM, this included 6,208 patients in the IBD cohort and 495,828 controls. The IBD cohort was less likely to be White (83.8% vs 92.6%, p<.001, SMD=0.319), more likely

to identify as Hispanic or Latino (7.2% vs 2.5%, p<.001, SMD=0.200), and had a higher prevalence of chronic kidney disease (16.1% vs 9.8%, p<.001, SMD=0.191), liver disease (12.6% vs 4.8%, p<.001, SMD=0.295), and chronic ischemic heart disease (21.0% vs 15.3%, p<.001, SMD=0.148). IBD patients also had slightly higher mean BMI (31.4 vs 31.9, p<.001, SMD=0.153).

BASELINE CHARACTERISTICS OF MATCHED COHORTS

Following 1:1 PSM, each cohort consisted of 6,134 patients. After matching, demographic and clinical characteristics were well balanced between cohorts (Table 1). The mean age was similar (67.4 vs 67.4 years, p=0.229, SMD=0.022), and the proportion of females was nearly identical (52.6% vs 52.5%, p=0.935, SMD=0.001). Racial and ethnic distributions showed no significant differences, with White patients representing 83.6% vs 83.8% and Hispanic or Latino patients 3.0% vs 3.2%. Comorbidities were also balanced, including hypertensive disease (76.6% vs 76.7%), chronic kidney disease (15.8% vs 15.5%), diabetes mellitus (28.3% vs 28.2%), obesity (28.3% vs 28.1%), and chronic ischemic heart disease (23.1% vs 23.1%). All covariates achieved acceptable balance, with standardized mean differences <0.1, except for BMI, which demonstrated residual imbalance.

90-DAY POSTOPERATIVE OUTCOMES

As early as 90 days after TKA, patients with IBD demonstrated higher risks of several medical complications than matched controls (Table 2). Specifically, IBD was associated with increased risk of pulmonary embolism (1.2% vs 0.8%, RR: 1.531 [95% CI: 1.070-2.190]; p=0.019), sepsis (0.9% vs 0.5%, RR: 1.893 [95% CI: 1.199-2.988]; p=0.006), acute kidney failure (1.5% vs 1.1%, RR: 1.391 [95% CI: 1.011-1.914]; p=0.042), and periprosthetic joint infection/deep surgical site infection (PJI/Deep SSI) (1.2% vs 0.8%, RR: 1.423 [95% CI: 1.000-2.025]; p=0.049). IBD was also associated with increased fall risk (1.7% vs 1.1%, RR: 1.493 [95% CI: 1.103-2.021]; p=0.009). No significant differences were observed for deep vein thrombosis (DVT), stroke, or abnormal gait within 90 days.

6-MONTH POSTOPERATIVE OUTCOMES

At 6 months, patients with IBD continued to show elevated complication rates. Risks were significantly higher for pulmonary embolism (1.7% vs 1.0%, RR: 1.619 [95% CI: 1.185-2.212]; p=0.002), sepsis (1.4% vs 0.8%, RR: 1.776 [95% CI: 1.253-2.515]; p=0.001), acute kidney failure (2.7% vs 2.0%, RR: 1.383 [95% CI: 1.097-1.745]; p=0.006), fall risk (3.1% vs 2.2%, RR: 1.545 [95% CI: 1.235-1.933]; p<0.001), and abnormal gait (4.0% vs 3.0%, RR: 1.333 [95% CI: 1.104-1.610]; p=0.003). No significant differences were identified for DVT, stroke, or PJI/Deep SSI at this interval.

TWO-YEAR POSTOPERATIVE OUTCOMES

At 2 years, IBD patients remained at higher risk for several key complications. Significant associations were observed for DVT (3.5% vs 2.5%, RR: 1.417 [95% CI: 1.154-1.740]; p=0.001), pulmonary embolism (2.8% vs 1.8%, RR: 1.545 [95% CI: 1.219-1.959]; p<0.001), sepsis (3.3% vs 2.2%, RR: 1.481 [95% CI: 1.194-1.838]; p<0.001), acute kidney failure (7.1% vs 5.3%, RR: 1.436 [95% CI: 1.246-1.655]; p<0.001), stroke (3.0% vs 2.3%, RR: 1.309 [95% CI: 1.053-1.628]; p=0.015), and PJI/Deep SSI (2.5% vs 1.7%, RR: 1.472 [95% CI: 1.153-1.879]; p=0.002). Fall risk (9.0% vs 6.6%, RR: 1.371 [95% CI: 1.211-1.551]; p<0.001) and abnormal gait (8.9% vs 7.0%, RR: 1.274 [95% CI: 1.129-1.439]; p<0.001) were also significantly elevated. No differences were detected for revision TKA or implant failure at 2 years.

FIVE-YEAR POSTOPERATIVE OUTCOMES

At 5 years, long-term complication burden remained significantly greater in the IBD cohort. Elevated risks included DVT (5.4% vs 3.5%, RR: 1.516 [95% CI: 1.282-1.793]; p<0.001), pulmonary embolism (4.1% vs 3.0%, RR: 1.339 [95% CI: 1.111-1.613]; p=0.002), sepsis (6.1% vs 4.3%, RR: 1.417 [95% CI: 1.215-1.652]; p<0.001), acute kidney failure (11.6% vs 8.8%, RR: 1.330 [95% CI: 1.196-1.479]; p<0.001), stroke (4.5% vs 3.5%, RR: 1.280 [95% CI: 1.075-1.526]; p=0.007), and PJI/Deep SSI (3.3% vs 2.5%, RR: 1.316 [95% CI: 1.069-1.620]; p=0.009). Functional complications remained significantly higher, including fall risk (15.0% vs 11.8%, RR: 1.273 [95% CI: 1.163-1.394]; p<0.001) and abnormal gait (13.6% vs 11.3%, RR: 1.192 [95% CI: 1.092-1.319]; p<0.001). Additionally, IBD patients demonstrated an increased risk of implant failure (4.7% vs 3.8%, RR: 1.232 [95% CI: 1.040-1.459]; p=0.016). Revision TKA was not significantly different between groups (2.3% vs 2.3%, RR: 1.014 [95% CI: 0.804-1.280]; p=0.903).

DISCUSSION

PRINCIPAL FINDINGS

In this large propensity score-matched cohort, preoperative IBD was associated with greater persistent postoperative morbidity after primary TKA. Compared to matched patients, those with IBD experienced elevated risks of sepsis, thromboembolic events, acute kidney failure, periprosthetic joint infection, abnormal gait, falls, and long-term implant failure across multiple postoperative timepoints. These elevated risks appeared as early as 90 days and persisted through 5 years of follow-up. While prior literature emphasizes early postoperative complications, our findings indicate that postoperative risk in IBD is broader and more persistent than previously appreciated.[5,8,9] Despite higher complication rates, revision TKA rates did not differ between cohorts, indicating that increased postoperative morbidity does not necessarily translate into higher revision rates.

PERIPROSTHETIC JOINT INFECTION AND SEPSIS

One of the most clinically important findings was the consistent elevation in infection-related complications. Patients with IBD demonstrated increased risks of sepsis and

Table 1. Cohort characteristics before and after propensity-score matching.

Matching Variables		Before Matching			After Matching		
	Cohort	Patients	P-Value	Std diff.	Patients	P-Value	Std diff.
Age at Index	TKA + IBD TKA - IBD	6,134 458,628	0.151	0.019	6,134 6,134	0.229	0.022
White	TKA + IBD TKA - IBD	5,095 338,850	<0.001	0.2	5,095 5,123	0.498	0.012
Female	TKA + IBD TKA - IBD	3,834 271,269	<0.001	0.052	3,834 3,831	0.955	0.001
Native Hawaiian or Other Pacific Islander	TKA + IBD TKA - IBD	11 2,226	<0.001	0.054	11 10	0.827	0.004
Not Hispanic or Latino	TKA + IBD TKA - IBD	4,689 332,377	<0.001	0.068	4,689 4,735	0.325	0.018
Hispanic or Latino	TKA + IBD TKA - IBD	196 20,417	<0.001	0.069	196 185	0.567	0.01
Black of African American	TKA + IBD TKA - IBD	428 48,544	<0.001	0.133	428 419	0.749	0.006
Male	TKA + IBD TKA - IBD	2,101 48,544	<0.001	0.064	2,101 2,103	0.97	0.001
Other Race	TKA + IBD TKA - IBD	101 168,814	<0.001	0.051	101 94	0.613	0.009
Asian	TKA + IBD TKA - IBD	102 18,628	<0.001	0.147	102 198	0.97	0.005
Diagnosis							
		Patients	P-Value	Std diff.	Patients	P-Value	Std diff.
Hypertensive diseases	TKA + IBD TKA - IBD	4,636 298,695	<0.001	0.211	4,636 4,674	0.423	0.014
Acute Kidney Failure and Chronic Kidney Disease (CKD)	TKA + IBD TKA - IBD	1,024 46,113	<0.001	0.191	1,024 981	0.294	0.019
Tobacco use	TKA + IBD TKA - IBD	236 11,698	<0.001	0.071	236 208	0.176	0.024
Overweight and Obesity	TKA + IBD TKA - IBD	2,984 173,908	<0.001	0.207	2,984 3,027	0.437	0.014
Diabetes Mellitus	TKA + IBD TKA - IBD	1,748 105,908	<0.001	0.119	1,748 1,735	0.795	0.005
Heart Failure	TKA + IBD TKA - IBD	658 30,351	<0.001	0.143	658 617	0.225	0.022
Diseases of the Liver	TKA + IBD TKA - IBD	1,086 36,233	<0.001	0.293	1,086 1,065	0.618	0.009
Chronic Ischemic Heart Disease	TKA + IBD TKA - IBD	1,418 72,508	<0.001	0.179	1,418 1,415	0.949	0.001
Laboratory							
	Cohort	Patients	P-Value	Std diff.	Patients	P-Value	Std diff.
BMI	TKA + IBD TKA - IBD	5,144 352,052	<0.001	0.085	5,144 5,175	<0.001	0.153
0 - 0 kg/m2	TKA + IBD TKA - IBD	5,144 352,052	<0.001	0.153	5,144 5,175	0.444	0.014

PJI/Deep SSI, including nearly double the risk of sepsis within 90 days and sustained elevation in both outcomes through 5 years. These findings align with prior literature demonstrating increased infection risk in IBD patients undergoing primary arthroplasty.[8,15] However, persistent infection risk beyond the perioperative period suggests a sustained biological vulnerability over time. Several mechanisms may explain this pattern. Corticosteroids and immunosuppressive biologic agents may impair host defense and wound healing.[12,13,16,17] Chronic immune dysregulation and intestinal barrier dysfunction may facilitate bacterial translocation, disease-related malabsorption, and systemic inflammatory activity.[18-20] These factors likely contribute to both early and delayed infectious complications, underscoring the need for prolonged infection surveillance and prevention strategies in this population.

THROMBOEMBOLIC AND CARDIOVASCULAR EVENTS

IBD was also associated with sustained thromboembolic risk following TKA. While early postoperative differences were modest, PE was significantly elevated by 6 months,

Table 2. Medical and mechanical complication rates in patients with IBD undergoing TKA.

Timeframe	Complication	IBD Risk (%) (# of pts)	Control Risk (%) (# of pts)	Risk Ratio (RR)	95% CI	Risk Difference	P-Value
90 Days	DVT	1.2% (76)	1% (60)	1.267	(0.905, 1.774)	0.003	0.168
	PE	1.2% (75)	0.8% (49)	1.531	(1.070, 2.190)	0.004	**0.019**
	Sepsis	0.9% (53)	0.5% (28)	1.893	(1.199, 2.988)	0.004	**0.005**
	Acute Kidney Failure	1.5% (89)	1% (64)	1.391	(1.011, 1.914)	0.004	**0.042**
	Stroke	0.9% (57)	0.7% (40)	1.425	(0.953, 2.132)	0.003	0.083
	PJI/Deep SSI	1.2% (74)	0.8% (52)	1.423	(1.000, 2.025)	0.004	**0.049**
	Fall Risk	1.7% (103)	1.1% (69)	1.493	(1.103, 2.021)	0.006	**0.009**
	Abnormal Gait	2.4% (149)	2% (122)	1.221	(0.964, 1.547)	0.004	0.097
6 Months	DVT	1.7% (104)	1.4% (83)	1.253	(0.941, 1.668)	0.003	0.122
	PE	1.7% (102)	1% (63)	1.619	(1.185, 2.212)	0.006	**0.002**
	Sepsis	1.4% (87)	0.8% (49)	1.776	(1.253, 2.515)	0.006	**0.001**
	Acute Kidney Failure	2.7% (166)	2% (120)	1.383	(1.097, 1.745)	0.007	**0.006**
	Stroke	1.4% (83)	1% (62)	1.339	(0.965, 1.857)	0.003	0.079
	PJI/Deep SSI	1.5% (93)	1.2% (72)	1.292	(0.952, 1.753)	0.003	0.1
	Fall Risk	3.1% (190)	2% (123)	1.545	(1.235, 1.933)	0.011	**<0.001**
	Abnormal Gait	4% (244)	3% (183)	1.333	(1.104, 1.610)	0.01	**0.003**
2 Years	DVT	3.5% (214)	2.5% (151)	1.417	(1.154, 1.740)	0.01	**0.001**
	PE	2.8% (170)	1.8% (110)	1.545	(1.219, 1.959)	0.01	**<0.001**
	Sepsis	3.3% (200)	2.2% (135)	1.481	(1.194, 1.838)	0.011	**<0.001**
	Acute Kidney Failure	7.1% (438)	5% (305)	1.436	(1.246, 1.655)	0.022	**<0.001**
	Stroke	3% (182)	2.3% (139)	1.309	(1.053, 1.628)	0.007	**0.015**
	PJI/Deep SSI	2.5% (156)	1.7% (106)	1.472	(1.153, 1.879)	0.008	**0.002**
	Fall Risk	9% (551)	6.6% (402)	1.371	(1.211, 1.551)	0.024	**<0.001**
	Abnormal Gait	8.9% (548)	7% (430)	1.274	(1.129, 1.439)	0.019	**<0.001**
	Revision TKA	1.5% (93)	1.2% (76)	1.224	(0.906, 1.653)	0.003	0.188
	Implant Failure	3.1% (188)	2.9% (177)	1.062	(0.868, 1.300)	0.002	0.559
5 Years	DVT	5.4% (329)	3.5% (217)	1.516	(1.282, 1.793)	0.018	**<0.001**
	PE	4.1% (249)	3% (186)	1.339	(1.111, 1.613)	0.01	**0.002**
	Sepsis	6.1% (374)	4.3% (264)	1.417	(1.215, 1.652)	0.018	**<0.001**
	Acute Kidney Failure	11.6% (714)	8.8% (537)	1.33	(1.196, 1.479)	0.029	**<0.001**
	Stroke	4.5% (274)	3.5% (214)	1.28	(1.075, 1.526)	0.01	**0.006**
	PJI/Deep SSI	3.3% (200)	2.5% (152)	1.316	(1.069, 1.620)	0.008	**0.009**
	Fall Risk	15% (918)	11.8% (721)	1.273	(1.163, 1.394)	0.032	**<0.001**
	Abnormal Gait	13.6% (834)	11.3% (695)	1.2	(1.092, 1.319)	0.023	**<0.001**
	Revision TKA	2.3% (140)	2.3% (138)	1.014	(0.804, 1.280)	<0.001	0.903
	Implant Failure	4.7% (287)	3.8% (233)	1.232	(1.040, 1.459)	0.009	**0.016**

and both DVT and PE were significantly elevated at 2 years and remained elevated through 5 years. Furthermore, ischemic stroke was significantly elevated at 2 and 5 years, suggesting that vascular risk after TKA may persist beyond the short-term window emphasized in prior TKA-focused research.[5,12,13] IBD is known to confer a hypercoagulable state, driven by chronic systemic inflammation, endothelial dysfunction, and coagulation pathway abnormalities.[12,13] Our findings extend this understanding into the postoperative orthopedic setting, suggesting that this prothrombotic state remains clinically relevant well beyond the immediate postoperative period.

FUNCTIONAL OUTCOMES: A NOVEL AND CLINICALLY MEANINGFUL CONTRIBUTION

A novel aspect of this study was the identification of greater functional impairment in IBD patients following TKA. Notably, fall risk was significantly elevated as early as 90 days and remained elevated through 5 years of follow-up. Similarly, abnormal gait became significantly elevated by 6 months and persisted through 5 years. While prior research has largely focused on infection, revision, and medical complications, functional outcomes in this population remain poorly characterized.[5,8-10,14] These findings are important because functional recovery is a primary determinant of patient satisfaction after TKA. These differences may reflect systemic inflammation, sarcopenia, nutritional deficiencies, and reduced physiologic reserve in IBD patients.[2,7,21] Furthermore, prolonged corticosteroid use may contribute to muscle weakness and impaired rehabilitation capacity.[22] These results highlight the importance of targeted rehabilitation strategies and fall prevention efforts in this population.

IMPLANT-RELATED FAILURE WITHOUT INCREASED REVISION: THE DISCONNECT

An important finding of this study was a trend toward increased implant failure at 2 years, with a statistically significant increase observed at 5 years among patients with IBD undergoing TKA. This discordance suggests that implant-related complications in IBD patients may not uniformly progress to revision surgery within the observed time frame. Prior literature evaluating arthroplasty outcomes in IBD patients has reported mixed findings regarding revision risk.[11,14] Several explanations may account for this observation. Patients with IBD may be less likely to undergo revision surgery because of greater medical complexity or surgical risk, and some implant-related complications may be managed nonoperatively. In addition, EHR-based datasets may not completely capture revisions performed outside participating institutions. These considerations suggest that implant-related burden may be underestimated when revision alone is used as the primary endpoint.

STUDY STRENGTHS AND LIMITATIONS

This study leverages a large multi-institutional EHR database and rigorous propensity score matching, strengthening inference regarding the independent impact of IBD on TKA outcomes. However, limitations must be acknowledged. Reliance on administrative coding introduces potential misclassification bias, and unmeasured confounders such as IBD disease activity, medication regimens, and nutritional status were not captured. Residual BMI imbalance was modest and may reflect propensity score prioritization of overall covariate balance, as well as inherent variability and incomplete BMI capture in EHR data. Additionally, follow-up depended on encounter coding, which may underestimate complication rates or fail to distinguish aseptic loosening from occult infection. Finally, revision TKA may be underreported in EHR systems, potentially masking associations between IBD and implant survivorship.

CLINICAL IMPLICATIONS AND FUTURE DIRECTIONS

Clinically, these findings suggest that patients with IBD undergoing TKA are a higher-risk population requiring enhanced perioperative management. Preoperative optimization should include nutritional status, medication exposure, and comorbidity burden. Postoperatively, clinicians should maintain heightened vigilance for infection, thromboembolic events, and functional decline. Future research should focus on prospective studies incorporating IBD disease activity, medication use, and nutritional status to better define modifiable risk factors. Ultimately, individualized perioperative strategies tailored to disease severity and treatment profile are needed to improve outcomes.

CONCLUSION

Inflammatory bowel disease is associated with a sustained increase in postoperative morbidity after total knee arthroplasty, with elevated risks of infectious, thromboembolic, cardiovascular, functional, and implant-related complications across short- and long-term follow-up. Notably, these increased risks did not translate into higher revision TKA rates in this large propensity score–matched cohort. These findings support heightened perioperative vigilance, closer long-term surveillance, and targeted optimization of modifiable risk factors in patients with IBD undergoing TKA.

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