

Impact of Gastrointestinal Bleeding History on Postoperative Outcomes in Total Hip and Knee Arthroplasty

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INTRODUCTION:

While gastrointestinal (GI) bleeding is common in older adults and contributes to immune dysregulation, its impact on total hip (THA) and knee (TKA) arthroplasty outcomes is poorly understood. This study aimed to evaluate the association of a history of GI bleeds with risk of infection and other complications up to 2 years following THA and TKA.

METHODS:

A retrospective review of the TriNetX Research Network identified 57,602 patients from 2005 to 2023 with a history of GI bleeds within 2 years prior to THA or TKA. Mean age was 71.3 years; 56.9% were female. Patients were propensity score matched 1:1 from a cohort of 897,336. Odds ratios were used for 90-day outcomes; Kaplan-Meier survival analysis evaluated 2-year outcomes.

RESULTS:

With a history of GI bleeds within 2 years of index procedure, sepsis within 90 days (OR: 2.0, 95% CI 1.8-2.3, p<0.001) and periprosthetic joint infections within 2 years (OR: 1.5, 95% CI 1.3-1.7, p <0.001) were more common. All evaluated 90-day medical complications were higher, including deep venous thrombosis (OR: 2.3, 95% CI 1.8-2.4, p<0.001), blood transfusion (OR: 2.6, 95% CI 2.2-3.1, p<0.001), and mortality (OR: 2.2, 95% CI 2.0-2.5, p<0.001). This cohort was more likely to be readmitted (OR: 2.7, 95% CI 2.6-2.8, p<0.001) and seek emergency care (OR: 2.4, 95% CI 2.3-2.5, p<0.001). They also experienced higher odds of adverse 2-year surgical outcomes, including revision surgery (OR: 1.6, 95% CI 1.4-1.8, p<0.001), periprosthetic fracture (OR: 1.6, 95% CI 1.3-1.9, p <0.001), and mechanical loosening (OR: 1.4, 95% CI 1.2-1.7, p<0.001).

DISCUSSION AND CONCLUSION:

These findings highlight an association between a history of GI bleeds with several major 90-day and 2-year complications, most importantly infection. With increasing understanding of the gut microbiome for immune function, further research is needed on GI tract optimization prior to surgery to mitigate postoperative complications.

	Prior to Propensity Score Matching			After Propensity Score Matching		
	GI Bleed Cohort (N= 57,602)	Control Cohort (N= 897,336)	P-Value	GI Bleed Cohort (N= 57,560)	Control Cohort (N= 897,336)	P-Value
Age at Index	71.3 (SD 10.5)	69.1 (SD 10.5)	<0.001	71.3 (SD 10.5)	71.2 (SD 10.5)	0.088
Sex						
Male	21,259 (36.9%)	343,048 (38.2%)	<0.001	21,259 (36.9%)	343,048 (38.2%)	0.836
Female	36,343 (63.1%)	554,288 (61.8%)	0.017	36,343 (63.1%)	554,288 (61.8%)	0.858
Unknown	3,229 (5.6%)	42,131 (4.7%)	<0.001	3,229 (5.6%)	42,131 (4.7%)	0.961
Race						
White	44,164 (76.7%)	676,108 (75.4%)	0.929	44,164 (76.7%)	676,108 (75.4%)	0.008
African American	6,407 (11.1%)	85,713 (9.6%)	<0.001	6,407 (11.1%)	85,713 (9.6%)	0.507
Asian	918 (1.6%)	12,242 (1.4%)	<0.001	918 (1.6%)	12,242 (1.4%)	0.151
American Indian	248 (0.4%)	3,370 (0.4%)	0.925	248 (0.4%)	3,370 (0.4%)	0.111
Native Hawaiian	823 (1.4%)	11,033 (1.2%)	<0.001	823 (1.4%)	11,033 (1.2%)	0.042
Other Race	733 (1.3%)	14,338 (1.6%)	<0.001	733 (1.3%)	14,338 (1.6%)	0.037
Unknown Race	6,207 (10.8%)	69,463 (7.7%)	<0.001	6,207 (10.8%)	69,463 (7.7%)	0.609
Ethnicity						
Hispanic or Latino	2,842 (4.9%)	39,605 (4.4%)	<0.001	2,842 (4.9%)	39,605 (4.4%)	0.216
Not Hispanic or Latino	41,760 (72.6%)	656,508 (73.5%)	<0.001	41,760 (72.6%)	656,508 (73.5%)	0.776
Unknown Ethnicity	13,170 (22.9%)	158,319 (17.6%)	<0.001	13,170 (22.9%)	158,319 (17.6%)	0.795
Medical Comorbidities						
Diabetes Mellitus	22,129 (38.4%)	222,787 (24.8%)	<0.001	22,129 (38.4%)	222,787 (24.8%)	0.557
Overweight/Obesity	31,238 (54.1%)	305,538 (34.1%)	<0.001	31,238 (54.1%)	305,538 (34.1%)	0.878
Atrial Fibrillation	14,219 (24.7%)	117,426 (13.1%)	<0.001	14,219 (24.7%)	117,426 (13.1%)	0.419
Heart Failure	15,172 (26.3%)	99,253 (11.1%)	<0.001	15,172 (26.3%)	99,253 (11.1%)	0.406
Hypertension	48,940 (84.9%)	586,845 (65.4%)	<0.001	48,940 (84.9%)	586,845 (65.4%)	0.535
Chronic Kidney Disease	16,278 (28.2%)	115,547 (12.9%)	<0.001	16,278 (28.2%)	115,547 (12.9%)	0.535
Chronic Obstructive Pulmonary Disease	13,088 (22.7%)	94,247 (10.5%)	<0.001	13,088 (22.7%)	94,247 (10.5%)	0.612

Table 1. Demographic information following propensity score matching.

	GI Bleed Cohort	Control Cohort	Odds Ratio (95% CI)	P-Value	Kaplan-Meier Survival at 2 years
Revision	593 (1.0%)	184 (0.2%)	1.6 (1.4, 1.8)	<0.001	98.6%
Periprosthetic Infection	460 (0.8%)	177 (0.2%)	1.5 (1.3, 1.7)	<0.001	99.1%
Periprosthetic Fracture	276 (0.5%)	117 (0.1%)	1.6 (1.3, 1.9)	<0.001	99.3%
Mechanical Loosening	353 (0.6%)	251 (0.3%)	1.4 (1.2, 1.7)	<0.001	99.2%

Table 2. Two-year surgical complications.

	GI Bleed Cohort	Control Cohort	Odds Ratio (95% CI)	P-Value
UTI	654 (1.1%)	471 (0.5%)	1.6 (1.4, 1.9)	<0.001
DCI	230 (0.4%)	199 (0.2%)	2.3 (1.8, 2.9)	<0.001
PE	202 (0.4%)	139 (0.2%)	1.5 (1.1, 2.0)	<0.001
Stroke	302 (0.5%)	219 (0.2%)	1.4 (1.1, 1.7)	<0.001
Sepsis	604 (1.0%)	322 (0.4%)	2.0 (1.8, 2.3)	<0.001
Acute Reoperation	249 (0.4%)	139 (0.2%)	1.8 (1.5, 2.2)	<0.001
MI	719 (1.2%)	242 (0.3%)	1.7 (1.5, 2.0)	<0.001
MI	245 (0.4%)	411 (0.5%)	1.5 (1.3, 1.7)	<0.001
Heart Failure	471 (0.8%)	440 (0.5%)	1.5 (1.3, 1.7)	<0.001
Mortality	1,241 (2.2%)	538 (0.6%)	2.2 (2.0, 2.5)	<0.001
Transfusion	478 (0.8%)	159 (0.2%)	2.6 (2.3, 3.1)	<0.001
Catheter	803 (1.4%)	533 (0.6%)	1.7 (1.5, 1.9)	<0.001
Atrial Fibrillation	464 (0.8%)	389 (0.4%)	1.3 (1.1, 1.5)	0.001
Anemia	264 (0.5%)	200 (0.2%)	2.1 (1.8, 2.5)	<0.001
Acute Renal Failure	708 (1.2%)	534 (0.6%)	1.4 (1.1, 1.7)	<0.001
Hospital Readmission (from 5 days to 90 days postoperative)	7,023 (12.2%)	2,838 (3.2%)	2.7 (2.4, 3.0)	<0.001
Emergency Department Services (from 5 days to 90 days postoperative)	9,189 (16.0%)	4,209 (4.7%)	2.4 (2.3, 2.5)	<0.001

Table 3. 90-day medical complications.