Impact of Pre-TJA Cystoscopy on Early and Late Postoperative Complications: A Propensity-Matched Cohort Analysis

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Background

- Total joint arthroplasty (TJA) is an increasingly performed procedure worldwide.
- Periprosthetic joint infection (PJI) is one of the most devastating complications after TJA.
- Many patients undergoing TJA have medical conditions that necessitate preoperative evaluation, including cystoscopy. However, the impact of cystoscopy performed prior to TJA on perioperative risk and postoperative outcomes remains unclear.
- No literature exists on this topic.

Objectives

We conducted a propensity-score matched analysis to:

Evaluate the association between cystoscopy performed within six months prior to primary TJA and subsequent medical and surgical complications at 90 days and 2 years postoperatively.

Methods

- We conducted a retrospective analysis using the TriNetX healthcare database (October 2005 – October 2023).
- We identified adult patients undergoing primary total knee (TKA) or hip (THA) arthroplasty using ICD-9/10 and CPT codes.
- Stratified patients based on whether they underwent cystoscopy within six months prior to TJA or not (control).
- 1:1 propensity score matched for relevant comorbidities, including age, sex, body mass index, diabetes, insulin, HbA1C and history of urinary tract infection (UTI) among other variables.
- Compared outcomes after matching.
- Outcomes of interest included:
  - 90-day risk of PJI, venous thromboembolism (VTE), UTI, acute kidney injury (AKI), readmission, emergency department (ED) utilization, sepsis, cellulitis, and Foley catheter insertion.
  - 2-year risk of PJI and revision surgery.
- TriNetX built-in tool for statistical analysis.
- Chi-square test for categorical variables and student t-test for continuous variables
- Significance threshold was set at $p<0.05$.

Results

TKA

- Initial query resulted in 280,779 patients.
- Cystoscopy: 1,290 patients vs Control: 279,489 patients.
- After 1:1 matching: 1,286 patients.
- Normalization of baseline demographics.

THA

- Initial query resulted in 205,089 patients
- Cystoscopy: 899 patients vs Control: 204,190 patients
- After 1:1 matching: 896 patients
- Normalization of baseline demographics

Results

TKA

- 90-day: Significantly higher risk of UTI (11.20% vs 5.99%, p<0.001) and ED utilization (15.01% vs 11.90%, p=0.021) in cystoscopy cohort compared with control.
- No significant difference in remaining outcomes (Table 1)
- 2 years: No significant difference in the risk of PJI (2.33% vs 3.42%, p=0.099) or revision surgery (2.26% vs 2.41%, p=0.794) between the cystoscopy and control cohorts.

90-day outcomes	Cystoscopy	Control	OR (95% CI)	p-value
PJI	1.32%	2.33%	0.56 (0.31,1.02)	0.056
VTE	5.05%	3.50%	1.47 (0.996, 2.16)	0.051
UTI	11.20%	5.99%	1.98 (1.48, 2.64)	**<0.001**
AKI	3.58%	2.72%	1.32 (0.85, 2.07)	0.214
Readmission	11.12%	10.42%	1.08 (0.84,1.38)	0.567
ED utilization	15.01%	11.90%	1.31 (1.04, 1.64)	**0.021**
Sepsis	1.40%	1.71%	0.82 (0.44, 1.53)	0.524
Cellulitis	2.41%	2.95%	0.81 (0.50, 1.31)	0.393
Foley insertion	1.56%	0.86%	1.83 (0.87, 3.84)	0.104

Acute kidney injury (AKI), confidence interval (CI), emergency department (ED), Odds ratio (OR), periprosthetic joint infection (PJI), urinary tract infection (UTI), and venous thromboembolism (VTE)

Table 1: Medical and surgical complications at 90 days in the TKA group

THA

- 90-day: Significantly higher risk of UTI (10.16% vs 6.70%, p=0.008) and ED utilization (12.95% vs 9.60%, p=0.025) in cystoscopy cohort compared with control.
- No significant difference in remaining outcomes (Table 2)
- 2 years: No significant difference in the risk of PJI (2.12% vs 1.45%, p=0.285) or revision surgery (2.34% vs 2.68%, p=0.651) between the cystoscopy and control cohorts.

90-day outcomes	Cystoscopy	Control	OR (95% CI)	p-value
PJI	1.67%	1.12%	1.51 (0.67,3.38)	0.314
VTE	3.13%	2.90%	1.08 (0.63, 1.86)	0.782
UTI	10.16%	6.70%	1.58 (1.12, 2.21)	**0.008**
AKI	3.01%	3.46%	0.87 (0.51, 1.47)	0.593
Readmission	10.60%	10.16%	1.05 (0.77, 1.42)	0.757
ED utilization	12.95%	9.60%	1.40 (1.04, 0.88)	**0.025**
Sepsis	1.79%	1.67%	1.07 (0.53, 2.17)	0.856
Cellulitis	1.79%	1.90%	0.94 (0.47, 1.87)	0.861
Foley insertion	1.79%	1.12%	1.61 (0.72,3.57)	0.236

Acute kidney injury (AKI), confidence interval (CI), emergency department (ED), Odds ratio (OR), periprosthetic joint infection (PJI), urinary tract infection (UTI), and venous thromboembolism (VTE)

Table 2: Medical and surgical complications at 90 days in the THA group

Conclusion

- Preoperative cystoscopy was not associated with increased risk of PJI up to 2 years postoperatively.
- Cystoscopy appears safe from an implant-related standpoint.
- These findings help guide surgical management and patient counseling.