

Predictive Factors for Post-Operative Urinary Retention in Total Hip Arthroplasty Patients

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INTRODUCTION: Postoperative urinary retention (POUR) is a common complication following many orthopaedic procedures. The incidence of POUR is reported as being as high as 70% in certain orthopedic surgeries.^{1,2} While POUR can often self-resolve, in some instances it can lead to bladder overdistension, bladder damage, and kidney failure. Even prompt treatment with catheterization can result in urologic injury. Previous studies have suggested possible risk factors for developing POUR including spinal anesthesia, large amounts of intraoperative fluids, and longer operation time.³⁻⁵ However, results from these studies have been inconsistent and conflicting. Identifying factors contributing to an increased risk of POUR can allow physicians to prevent POUR or treat it early. This may lead to a reduction in patient discomfort and pain as well as POUR-related complications. In patients undergoing total hip arthroplasty, the development of POUR can lead to urinary tract infections. This can subsequently result in bacteremia, prosthetic joint infection, and possible prosthesis removal.⁶ This study aims to determine the incidence of POUR in patients undergoing THA and identify predictive risk factors.

METHODS: A retrospective analysis of patient chart data was performed for patients who underwent total hip arthroplasty at an urban, tertiary care center during the calendar year 2022. This identified 96 total patients. POUR was defined as a bladder scan of 300 mL or higher, the postoperative necessity of a straight catheterization, or a urology consult for urinary retention. Patient demographics, comorbidities (ie. Charlson Comorbidity Index (CCI)), and operative details including length of surgery and length of stay (LOS) were collected. Patients were stratified into one of two groups based on the presence or absence of POUR. Independent t-tests and Chi-square tests were performed to determine an association between the aforementioned patient factors and the development of POUR.

RESULTS SECTION: A total of 96 patients undergoing THA were analyzed, with 5 patients meeting criteria for POUR. We found no significant differences in demographic factors between controls and patients with POUR (**Table 1**). Patients with POUR had a significantly higher incidence of stroke than controls. POUR patients also had higher rates of chronic pulmonary disease, which was trending toward significance. The total CCI score was higher for patients with POUR than controls (**Figure 1**). This also approached significance. Patients with POUR underwent longer THA's than controls with a mean difference in length of surgery being 47.20 minutes. This was near significance. There were no significant differences in anesthesia type or length of hospital stay between the two groups.

DISCUSSION: POUR is a relatively common complication that significantly increases post-operative morbidity and reduces patient satisfaction. We report that patients who developed POUR following THA had higher rates of comorbidities, including stroke and chronic pulmonary disease. Interestingly, the type of anesthesia used did not significantly correlate with development of POUR. This is incongruent with previous studies.^{3,4} Unsurprisingly, length of hospital stay was longer in POUR patients, but this difference was not significant. Limitations of this study include a small sample size and the analysis of patients from a single institution. Despite these limitations, we have identified several predictive factors for POUR in patients undergoing THA. Since POUR has been reported to lead to increased length of stay, reducing the incidence may lead to decreased healthcare costs, which is especially important in the era of same day discharge and bundled payment initiatives.

SIGNIFICANCE/CLINICAL RELEVANCE: We discovered several risk factors for the development of postoperative urinary retention in patients undergoing THA. Orthopaedic surgeons may stratify their patients based on these factors and develop pre- and intraoperative management strategies to mitigate the risk of POUR.

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IMAGES AND TABLES:

| Patient Factors | | Control (n = 91) ¹ | POUR (n = 5) ¹ | p-value ² |
|----------------------------------|-----------------------------|-------------------------------|---------------------------|----------------------|
| Demographics | Age (years) | 62.71 ± 10.39 | 67.00 ± 5.43 | 0.364 |
| | BMI | 31.95 ± 5.58 | 31.34 ± 6.52 | 0.814 |
| | Alc | 5.95 ± 0.62 | 5.73 ± 0.45 | 0.551 |
| Charlson Comorbidity Index (CCI) | Diabetes | 0.19 ± 0.45 | 0.2 ± 0.45 | 0.949 |
| | Renal Disease | 0.12 ± 0.44 | 0.4 ± 0.89 | 0.2 |
| | PVD | 0.066 ± 0.25 | 0.20 ± 0.45 | 0.266 |
| | Stroke | 0.011 ± 0.11 | 0.200 ± 0.45 | 0.004 |
| | COPD | 0.22 ± 0.42 | 0.60 ± 0.55 | 0.053 |
| | Malignancy | 0.15 ± 0.74 | 0.40 ± 0.89 | 0.477 |
| | CCI (total) | 2.67 ± 1.92 | 4.40 ± 1.67 | 0.052 |
| Type of Anesthesia | General | 30 | 2 | 0.745 |
| | Epidural | 57 | 3 | 0.906 |
| | Spinal | 60 | 4 | 0.516 |
| | MAC | 17 | 1 | 0.941 |
| Perioperative Data | Length of Surgery (minutes) | 165.8 ± 57.23 | 213.00 ± 63.13 | 0.077 |
| | Total LOS (hours) | 87.95 ± 94.23 | 116.56 ± 73.29 | 0.507 |

Table 1. Differences in comorbidities, CCI metrics, anesthesia type, and perioperative data.

¹Mean ± SD; n

²Independent sample t-test; Chi-square test

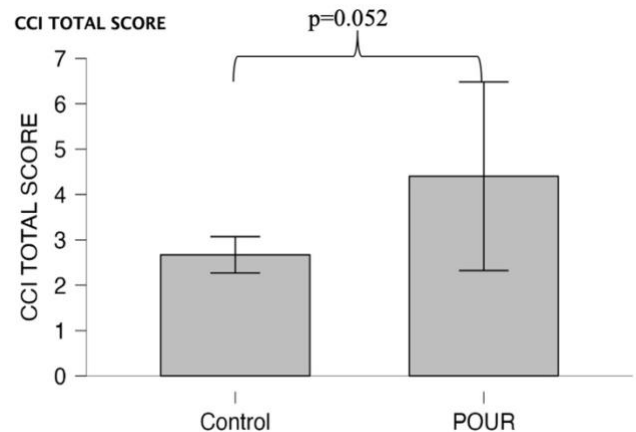


Figure 1. Difference in Total Charlson Comorbidity Index (CCI) Scores.