

Should urinary catheter be used during routine primary knee or hip arthroplasty?

Atthakorn Jarusriwanna, Kerem Başarır, Daniele De Meo, William Jiranek, Koos Jordaan, Deiry Kader, Gokhan Kaynak, Gabriele Tucci

Response/Recommendation: Routine use of urinary catheters is not required in patients undergoing total joint arthroplasty.

Level of evidence: Moderate

Rationale

It is controversial whether using urinary catheters in routine primary knee or hip arthroplasty can help prevent urinary retention after surgery. However, perioperative indwelling urinary catheters might delay postoperative mobilization and increase hospital stay [1, 2]. Several studies have shown that the use of urinary catheter is associated with an increased risk of urinary tract infections (UTIs) [3, 4] and results in higher hospital costs [5, 6].

A comprehensive search was conducted on PubMed, Scopus, and the CINAHL database, resulting in 1,202 abstracts. After screening, fifty-five manuscripts were included in the final review. The majority of studies did not use perioperative urinary catheters (29 studies). The definition of postoperative urinary retention (POUR) varies, including the inability to voluntarily empty the bladder, causing bladder overload, or the inability to void that requires the placement of an indwelling or straight catheter. It also includes specific cut-off values for bladder volumes as measured by bladder scanning [7, 8]. The overall rate of POUR in patients without the use of urinary catheters was 15.94%, while patients with perioperative placement of urinary catheters had an overall POUR rate of 5.64% after catheter removal. The perioperative use of urinary catheters was associated with a reduced odds of POUR (Odds ratio= 0.32, 95%CI 0.28-0.35). However, indwelling urinary catheters revealed a higher risk of UTIs with an odds ratio of 1.19 (95%CI 1.02-1.40), while the risk of periprosthetic joint infection (PJI) was comparable (OR 1.21; 95%CI 0.38-3.81). The type of anesthesia is another factor related to the risk of POUR. General anesthesia was associated with decreased odds of POUR (OR 0.84; 95% CI 0.74-0.95) compared to regional anesthesia. Male patients over 65 years of age who underwent spinal anesthesia with intrathecal morphine were identified as having risk factors associated with POUR [9], as the prevalence and progression of benign prostatic hyperplasia (BPH) is increased in older males. Additionally, patients

with symptomatic BPH had an increased risk for developing POUR (OR 2.64; 95%CI 1.93-3.61), UTIs (OR 6.24; 95%CI 2.25-17.35), and PJI (OR 6.85; 95%CI 1.87-25.08) [10]. For patients with BPH, using the International Prostate Symptom Score (IPSS) to evaluate the risk of POUR could be a useful tool to determine the necessity of prophylactic catheterization [11, 12]. In patients who developed POUR, intermittent catheterization may be required to manage the condition, and it has demonstrated a lower risk of UTIs compared to indwelling urinary catheters [13].

References

1. Ripoll SMJ, Aldecoa CS, Fern Índez-Garc AR, Varela-Dur Ín M, Aracil-Escoda N, Garc ARGD, et al. Early mobilization after total hip or knee arthroplasty: a substudy of the POWER.2 study. *Braz J Anesthesiol.* 2023;73(1):54-71.
2. Carlock KD, Mills ZD, Geiger KW, Manner PA, Fernando ND. Routine Indwelling Urinary Catheterization Is Not Necessary During Total Hip Arthroplasty Performed Under Spinal Anesthesia. *Arthroplast Today.* 2022;16:68-72.
3. Bjerregaard LS, Homilius M, Bagi P, Hansen TB, Kehlet H. Indwelling urinary catheterisation may increase risk of complications in hip and knee arthroplasty. *Dan Med J.* 2019;66(4):A5538.
4. Halawi MJ, Gronbeck C, Metersky ML, Wang Y, Eckenrode S, Mathew J, et al. Time Trends in Patient Characteristics and In-Hospital Adverse Events for Primary Total Knee Arthroplasty in the United States: 2010-2017. *Arthroplast Today.* 2021;11:157-62.
5. Iorio R, Healy WL, Patch DA, Appleby D. The role of bladder catheterization in total knee arthroplasty. *Clin Orthop Relat Res.* 2000(380):80-4.
6. Iorio R, Whang W, Healy WL, Patch DA, Najibi S, Appleby D. The utility of bladder catheterization in total hip arthroplasty. *Clin Orthop Relat Res.* 2005(432):148-52.
7. Magaldi RJ, Strecker SE, Nissen CW, Witmer DK, Carangelo RJ. Preoperative Bladder Scanning Can Predict Postoperative Urinary Retention Following Total Joint Arthroplasty. *J Bone Joint Surg Am.* 2024;106(7):569-74.
8. Mathew M, Ragsdale TD, Pharr ZK, Rider CM, Mihalko WM, Toy PC. Risk Factors for Prolonged Time to Discharge in Total Hip Patients Performed in an Ambulatory Surgery Center due to Complaints of the Inability to Void. *J Arthroplasty.* 2021;36(11):3681-5.
9. Dana E, Ben-Zur O, Dichtwald S, Feigin G, Brin N, Markushevich M, et al. Postoperative urinary retention following hip or knee arthroplasty under spinal anaesthesia with intrathecal morphine: a retrospective cohort study. *Singapore Med J.* 2023.

10. Jiang B, Xu H, Ding Z, Lai Y, Yuan M, Zhou Z. Symptomatic Benign Prostatic Hyperplasia: An Optimizable Risk Factor for Periprosthetic Joint Infection After Elective Primary Total Knee Arthroplasty. *J Arthroplasty*. 2023;38(10):2142-8.
11. Kieffer WK, Kane TP. Predicting postoperative urinary retention after lower limb arthroplasty. *Ann R Coll Surg Engl*. 2012;94(5):356-8.
12. Scholten R, Kremers K, van de Groes SAW, Somford DM, Koëter S. Incidence and Risk Factors of Postoperative Urinary Retention and Bladder Catheterization in Patients Undergoing Fast-Track Total Joint Arthroplasty: A Prospective Observational Study on 371 Patients. *J Arthroplasty*. 2018;33(5):1546-51.
13. Garbarino LJ, Gold PA, Anis H, Sodhi N, Burshtein J, Burshtein A, et al. The Effect of Bladder Catheterization Technique on Postoperative Urinary Tract Infections After Primary Total Hip Arthroplasty. *J Arthroplasty*. 2020;35(6s):S325-s9.