International Platform of Registered Systematic Review and Meta-analysis Protocols

INPLASY

Effect of Transurethral Intravesical Instillation of Local Anesthetics on Postoperative Catheter-Related Bladder Discomfort: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

INPLASY202640001
doi: 10.37766/inplasy2026.4.0001
Received: 1 April 2026
Published: 1 April 2026

Wen, DX; Zhang, JW; Xie, WJ; Zhou, Q; Lu, KS.

Corresponding author:
Keshi Lu

keshilu@szu.edu.cn

Author Affiliation:
Department of Urology, Shenzhen University General Hospital, Shenzhen University Clinical Medical Academy, Shenzhen 518055, China.

ADMINISTRATIVE INFORMATION

Support - This study was not supported by any funding.

Review Stage at time of this submission - Formal screening of search results against eligibility criteria.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202640001

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 1 April 2026 and was last updated on 1 April 2026.

INTRODUCTION

Review question / Objective P (Population): Adult patients undergoing surgical procedures requiring indwelling urinary catheterization
I (Intervention): Intravesical instillation of local anesthetics via urinary catheter.
C (Comparison): Placebo (normal saline instillation) or no treatment.
O (Outcomes): Primary outcome: incidence of CRBD at postoperative time points (e.g., 0, 1, 6, 24 h). Secondary outcomes: severity of CRBD, patient catheter-related comfort or satisfaction scores, and adverse events related to local anesthetic instillation.
S (Study Design): Randomized controlled trials (RCTs).

Condition being studied Catheter-related bladder discomfort (CRBD), a distressing condition characterized by suprapubic pain, urinary urgency, and pelvic discomfort. Previous studies have reported that CRBD affects 47%–90% of catheterized patients, thereby significantly impairing postoperative recovery through delayed mobilization, prolonged hospitalization, and reduced patient satisfaction.

METHODS

Participant or population Regarding the population, studies enrolling adult patients aged ≥18 years who underwent any type of surgical procedure requiring intraoperative or postoperative urinary catheterization were included.

Intervention For the intervention, studies investigating at least one local anesthetic agent.

Comparator Placebo or no treatment.

Study designs to be included Randomized Controlled Trial.

Eligibility criteria Only published full-text randomized controlled trials (RCTs) were included, with no restrictions on language or publication

date.Studies were excluded if they met any of the following criteria: (1) case reports, conference abstracts or proceedings, review articles, editorials, or letters to the editor; (2) animal studies or in vitro experiments; (3) studies for which full-text data were unavailable or could not be retrieved; (4) duplicate publications reporting the same patient population and dataset.

Information sources The literature search was conducted across PubMed/MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials (CENTRAL) from database inception to March 17, 2026. In addition, the reference lists of all included studies and relevant systematic reviews were manually screened to identify any additional eligible studies not captured by the electronic database search.

Main outcome(s) Primary outcome: incidence of CRBD at postoperative time points (e.g., 0, 1, 6, 24 h). Secondary outcomes: severity of CRBD, patient catheter-related comfort or satisfaction scores, and adverse events related to local anesthetic instillation.Eligible outcomes included the incidence or severity of postoperative CRBD, as well as patient catheter-related satisfaction or comfort scores.

Quality assessment / Risk of bias analysis Cochrane Risk of Bias tool, with each domain rated as low risk, high risk, or unclear risk of bias.

Strategy of data synthesis Data extraction and statistical analyses were performed using RevMan 5.4.0 (Cochrane Collaboration, London, UK). Only variables assessed by at least two studies were included in the meta-analysis. Dichotomous data were analyzed using risk ratio (RR) with 95% confidence intervals (CIs). For continuous data, standardized mean difference (SMD) or mean difference (MD) with 95% CIs were calculated. A fixed-effects model was used when heterogeneity was not significant ($I^2 \leq 50\%$), whereas a random-effects model was adopted when significant heterogeneity was detected ($I^2 > 50\%$). When significant heterogeneity was observed in primary outcomes, subgroup analyses and sensitivity analyses were conducted to investigate potential sources of heterogeneity. Subgroup analyses were performed only when at least two trials were available within a given subgroup. Statistical significance was defined as $p < 0.05$.

Subgroup analysis Subgroup analyses were performed to explore potential sources of heterogeneity and to assess the consistency of treatment effects across different subgroups. Studies were stratified by type of local anesthetic (ropivacaine vs. lidocaine), dose of local anesthetic (1 mL/h vs. 2 mL/h), and type of surgical procedure. The results were considered consistent if the direction and magnitude of the effect size were similar across subgroups.

Sensitivity analysis Sensitivity analysis was conducted by sequentially excluding one study at a time (leave-one-out analysis) to evaluate the robustness of the pooled estimates and to identify any individual study that disproportionately influenced the overall results. The stability of the conclusions was confirmed if the direction and magnitude of the effect size remained consistent after each exclusion.

Country(ies) involved China.

Keywords Local Anesthetics ; CRBD ; Meta-Analysis.

Contributions of each author
Author 1 - Dexing Wen.
Author 2 - Jiawei Zhang.
Author 3 - Weijie Xie.
Author 4 - Qi Zhou.
Author 5 - Keshi Lu.