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INPLASY

Robot-assisted versus laparoscopic pyeloplasty for pediatric ureteropelvic junction obstruction: a systematic review and meta-analysis of efficacy and safety

INPLASY2026110011
doi: 10.37766/inplasy2026.11.0011
Received: 3 November 2026
Published: 4 November 2026

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ADMINISTRATIVE INFORMATION

Support - No support.

Review stage at the time of initial registration - Preliminary searches.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2026110011

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 4 November 2026 and was last updated on 4 November 2026.

INTRODUCTION

Review question / Objective To systematically evaluate the efficacy and safety of robot-assisted pyeloplasty (RAP) versus conventional laparoscopic pyeloplasty (LP) for pediatric ureteropelvic junction obstruction (UPJO).

Condition being studied Pediatric ureteropelvic junction obstruction (UPJO).

METHODS

Participant or population Children aged 0-18 years with confirmed ureteropelvic junction obstruction (UPJO).

Intervention Robot-assisted pyeloplasty (RAP).

Comparator Conventional laparoscopic pyeloplasty (LP).

Study designs to be included Randomized controlled trials (RCTs) and prospective or retrospective cohort studies.

Eligibility criteria Inclusion criteria: ① study population of children aged 0-18 years with confirmed UPJO; ② direct comparison of RAP versus LP as the intervention; ③ study designs of randomized controlled trials (RCTs) or prospective or retrospective cohort studies; ④ reporting of at least one outcome among operative time, intraoperative blood loss, postoperative hospital stay, and postoperative complications; ⑤ language restricted to Chinese and English.
Exclusion criteria: ① non-comparative studies (single-arm studies, reviews, conference abstracts, etc.); ② duplicate publications or studies with overlapping data (the one with the largest sample size or the most complete follow-up was retained); ③ full text unavailable or key data incomplete and not amenable to conversion; ④ animal

experiments; ⑤ case reports or case series with fewer than 10 cases.

Information sources PubMed, China National Knowledge Infrastructure (CNKI), Wanfang Data Knowledge Service Platform, and VIP Chinese Science and Technology Journal Database, searched from inception to October 2026.

Main outcome(s) Primary outcomes: Overall postoperative complications (Clavien-Dindo classification) and operative time. Secondary outcomes: Intraoperative blood loss, postoperative hospital stay, success rate, Clavien-Dindo grade >= III complications, and reoperation rate.

Quality assessment / Risk of bias analysis The Newcastle-Ottawa Scale (NOS) was used to assess the quality of cohort studies. The Cochrane risk-of-bias tool (RoB 2) was used to assess the RCT.

Strategy of data synthesis RevMan 5.4 and R 4.3.0 (meta package) will be used. Odds ratios (OR) with 95% confidence intervals (CI) will be used for dichotomous variables, and mean differences (MD) with 95% CI for continuous variables. Heterogeneity will be assessed using the Q test and I^2 statistic. A fixed-effects model will be applied when $I^2 \leq 50\%$, and a random-effects model when $I^2 > 50\%$. Data reported as medians (IQR/range) will be converted to means ± standard deviations using the method of Wan et al. A 0.5 continuity correction will be applied for zero-event cells.

Subgroup analysis Not planned. No subgroup analyses were conducted in this study.

Sensitivity analysis Leave-one-out sensitivity analyses will be performed to explore the robustness of the results and sources of heterogeneity. A 0.5 continuity correction will be applied for dichotomous data with zero-event cells.

Country(ies) involved China.

Keywords Ureteropelvic junction obstruction; Robotic surgery; Laparoscopy; Pyeloplasty; Child.

Contributions of each author

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