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Meta-analysis of the effectiveness and safety of robotic-assisted versus laparoscopic transabdominal preperitoneal repair for inguinal hernia

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 September 2023 and was last updated on 14 September 2023.

INTRODUCTION

Review question / Objective This study aims to investigate the effectiveness and safety of robot-assisted transabdominal preperitoneal repair (RTAPP) and laparoscopic transabdominal preperitoneal repair (LTAPP) for inguinal hernia. To systematically evaluate the analgesic efficacy and safety of the pudendal nerve block in the application of hemorrhoidectomy.

Condition being studied This study aims to investigate the effectiveness and safety of robot-assisted transabdominal preperitoneal repair (RTAPP) and laparoscopic transabdominal preperitoneal repair (LTAPP) for inguinal hernia.

METHODS

Participant or population Patients diagnosed with inguinal hernia.

Intervention Robotic-assisted transabdominal preperitoneal tension-free repair.

Comparator Laparoscopic transabdominal preperitoneal tension-free repair. Robotic-assisted transabdominal preperitoneal tension-free repair.

Study designs to be included Randomized controlled trials and non-randomized controlled studies (retrospective or case-control studies).

Eligibility criteria (1) Study Subjects: Individuals diagnosed with inguinal hernia through

preoperative physical examination and ultrasound, aged over 18 years, of any gender. (2) Intervention: Either robotic-assisted transabdominal preperitoneal tension-free repair or laparoscopic transabdominal preperitoneal tension-free repair, with no restriction on the type of mesh used during surgery. (3) Study Type: Randomized controlled trials, non-randomized controlled studies (retrospective or case-control studies), limited to publications in English.

Information sources The Cochrane Library, Embase database, and PubMed database.

Main outcome(s) Operation time, hospital stay, cost, incidence of seroma, overall complication rate, readmission rate, recurrence rate.

Quality assessment / Risk of bias analysis The quality of included randomized controlled studies was assessed using the modified Jadad scale, which includes four criteria: (1) random sequence generation, (2) allocation concealment, (3) blinding, and (4) withdrawals and dropouts. The total score is 7 points, with scores of ≤ 3 considered low-quality literature and scores of 4-7 considered high-quality literature. Non-randomized controlled studies were assessed for quality using the NOS (Newcastle-Ottawa Scale), with scoring criteria including (1) selection, (2) comparability, and (3) exposure. Scores of 7-9 indicate high-quality studies, scores of 4-6 indicate medium-quality studies, and scores of 1-3 indicate low-quality studies.

Strategy of data synthesis Data from the included literature were combined and analyzed using RevMan 5.3 software. For continuous variables and binary variables in the studies, mean differences (MD) and odds ratios (OR) were calculated as effect measures along with their corresponding 95% confidence intervals (CI). Heterogeneity among the included studies was assessed using the chi-squared (χ^2) test, and the magnitude of heterogeneity was quantified using the I^2 statistic. If there was no significant heterogeneity among the studies ($I^2 \leq 50\%$, $P \geq 0.10$), a fixed-effects model was used for analysis. If heterogeneity was present ($I^2 > 50\%$, $P < 0.10$), a random-effects model was employed for analysis. For indicators with more than 10 included studies, the potential publication bias was assessed using a funnel plot of the main results. If the plot showed good symmetry, it indicated no significant publication bias [25]. The significance level was set at $\alpha = 0.05$.

Subgroup analysis Subgroup analysis was conducted for studies with obvious heterogeneity.

Sensitivity analysis Sensitivity analysis was repeated each time after a single study was removed to evaluate the impact of the study on the combined effect and evaluate the impact of the study on this indicator.

Country(ies) involved China.

Keywords robotic surgery; laparoscopic, transabdominal preperitoneal; inguinal hernia, meta-analysis.

Contributions of each author

Author 1 - Hui Dong.

Author 2 - Li Li.

Author 3 - Deng-Chao Wang.

Author 4 - Jian Wei.