INPLASY

Single-incision laparoscopic appendectomy versus conventional three-port laparoscopic appendectomy for acute appendicitis: a meta-analysis of randomized controlled trials

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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 25 July 2023 and was last updated on 25 July 2023.

INTRODUCTION

Review question / Objective To systematically evaluate the safety and efficacy of single-incision laparoscopic appendectomy (SILA) compared to conventional three-port laparoscopic appendectomy (CTLA).

Condition being studied The topic of the study is the treatment of acute appendicitis. The study focuses on evaluating the efficacy and safety of single-incision laparoscopic surgery in the treatment of acute appendicitis. The traditional treatment approach involves open abdominal surgery for appendectomy, but with the advancement of laparoscopic techniques, single-incision laparoscopic surgery has become an effective alternative. The study conducted a meta-analysis to comprehensively assess the application of single-incision laparoscopic surgery and aims to provide high-quality evidence to guide clinical practice and decision-making.

METHODS

Participant or population Patients diagnosed with acute appendicitis requiring appendectomy.

Intervention The study group underwent single-incision laparoscopic appendectomy.

Comparator The control group underwent conventional three-port laparoscopic appendectomy.

Study designs to be included Randomized controlled trials (RCTs).

Eligibility criteria Patients diagnosed with acute appendicitis requiring appendectomy.

Information sources China National Knowledge Infrastructure (CNKI), VIP Database, Wanfang Database, China Biological Medicine (CBM) Database, PubMed, Embase, and The Cochrane Library.

Main outcome(s) ① Operation time; ② Postoperative 24-hour pain score; ③ Incidence of wound infection; ④ Overall complication rate; ⑤ Time to return to normal activities; ⑥ Satisfaction score; ⑦ Cosmetic score.

Quality assessment / Risk of bias analysis The quality of the included studies was evaluated using the risk of bias assessment tool recommended by the Cochrane Handbook for Systematic Reviews of Interventions, version 5.1.0. The assessment criteria included random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other biases. Each of the aforementioned items was categorized as low risk, unclear risk, or high risk. In cases of disagreement, a third-party researcher was involved in the discussion to reach a consensus.

Strategy of data synthesis Meta-analysis was conducted using RevMan 5.3 software. Count data were expressed as relative risks (RR) with 95% confidence intervals (CI). Continuous variables, such as operation time, postoperative 24-hour pain score, and time to return to normal activities, were expressed as mean differences (MD) with 95% CI. Due to variations in scoring scales for satisfaction score and cosmetic score across different studies, resulting in substantial differences in the mean outcomes, standardized mean differences (SMD) with 95% CI were used. The Q-test and I2 test were used to assess the heterogeneity among the included studies. If $P > 0.1$ or $I2 \leq 50\%$, it indicated no significant statistical heterogeneity among the studies, and a fixed-effects model was employed for the analysis. Conversely, a random-effects model was used for the analysis if there was significant heterogeneity ($P \leq 0.1$ or $I2 > 50\%$). Subgroup analysis was performed based on factors that may contribute to heterogeneity in the included studies, and sensitivity analysis was conducted to assess the stability of the results. Funnel plots and Egger's test were used for publication bias analysis for outcomes with more than 10 included studies. A significance level of $P < 0.05$ was considered statistically significant.

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 appendicitis; appendectomy; single-incision laparoscopy; meta-analysis.

Contributions of each author
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