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Self-Fixating Versus Conventional Mesh in Laparoscopic Inguinal Hernia Repair—A Systematic Review and Meta-analysis of Randomized Trials with GRADE and Trial Sequential Analysis

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ADMINISTRATIVE INFORMATION**Support** - None.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202690056**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 13 September 2026 and was last updated on 13 September 2026.**INTRODUCTION**

Review question / Objective To determine whether self-fixating mesh offers clinical advantages over conventional mesh in laparoscopic inguinal hernia repair, considering postoperative recovery, complications, chronic pain, and hernia recurrence.

Condition being studied Inguinal hernia treated by laparoscopic repair. Mesh characteristics and fixation techniques may affect surgical efficiency, postoperative discomfort, and the durability of repair.

METHODS

Participant or population Patients undergoing transabdominal preperitoneal (TAPP) or totally extraperitoneal (TEP) repair for inguinal hernia. Studies involving both open and laparoscopic procedures were eligible only when data for laparoscopic repair could be extracted separately.

Intervention Laparoscopic inguinal hernia repair using self-fixating mesh, including self-gripping mesh.

Comparator Laparoscopic repair using conventional, non-self-fixating flat mesh, with fixation by tacks, sutures, or tissue glue, or without fixation.

Study designs to be included Randomized controlled trials.

Eligibility criteria (1) Randomized controlled trials (RCTs).
(2) Patients undergoing TAPP or TEP inguinal hernia repair.
(3) Direct comparison of self-fixating mesh with conventional non-self-fixating flat mesh.
(4) Reporting at least one eligible outcome with data suitable for quantitative synthesis.

Information sources PubMed, Embase, the Cochrane Library, Web of Science Core Collection, CNKI, Wanfang Data, VIP, and the China Biology Medicine database were searched from inception to July 6, 2026, without language restrictions. Database-specific strategies combined controlled vocabulary and free-text terms addressing inguinal hernia, laparoscopic repair, and self-fixating mesh.

Main outcome(s) Operative time. Postoperative pain scores at 24 h. Length of hospital stay. Overall postoperative complications. Seroma formation. Chronic postoperative pain. Herni recurrence.

Quality assessment / Risk of bias analysis Two reviewers independently evaluated each RCT using the Cochrane Risk of Bias tool (RoB 1). Assessments covered random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting, and other potential sources of bias. Each domain was classified as low, high, or unclear risk. Disagreements were resolved through discussion or consultation with a third reviewer.

Strategy of data synthesis Quantitative synthesis was performed using RevMan 5.4. Binary outcomes were summarized as risk ratios (RRs), and continuous outcomes as mean differences (MDs), with 95% confidence intervals (CIs). Standardized mean differences were used when measurement scales differed.

Heterogeneity was evaluated using Cochran's Q test and the I^2 statistic. A fixed-effect model was applied when $P \geq 0.10$ and $I^2 \leq 50\%$; otherwise, a random-effects model was used. Statistical significance was defined as a two-sided $P < 0.05$.

For outcomes with at least 10 studies contributing estimable effects, publication bias was examined using funnel plots and Begg's and Egger's tests. Trial sequential analysis (TSA) assessed the sufficiency of cumulative evidence, using a two-sided type I error rate of 5% and statistical power of 80%.

Subgroup analysis Subgroup analyses examined whether treatment effects differed by surgical approach (TAPP versus TEP), conventional mesh fixation method, mesh type, and study country or region.

Sensitivity analysis None.

Country(ies) involved China.

Keywords Inguinal hernia; Laparoscopic repair; Self-fixating mesh; Conventional mesh; Systematic review; Meta-analysis; Randomized controlled trials.

Contributions of each author

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