INPLASY

Third-Space Endoscopy in Saudi Arabia: Evolution, Outcomes, and Future Directions - A Systematic Review

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ADMINISTRATIVE INFORMATION

Support - No funding was received for this study.

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 12 May 2026 and was last updated on 12 May 2026.

INTRODUCTION

Review question / Objective Examen the evolution of Third-Space Endoscopy (TSE) procedures globally and regionally, highlighting Saudi Arabia's contribution to TSE, and outlining strategies for future advancements.

Rationale Access to TSE in Saudi Arabia remains limited to large academic hospitals, and national data on procedural outcomes, training standardization, and long-term safety are still evolving.

Condition being studied Gastrointestinal.

METHODS

Search strategy A comprehensive electronic search was conducted across PubMed, Scopus, Google Scholar, and regional academic e-repositories (Saudi Digital Library), in addition to hand-searching the reference lists of articles/ reviews identified from January 2010 to April 2025. Search terms combined Medical Subject Headings (MeSH) and free-text keywords: ("Peroral Endoscopic Myotomy"[MeSH] OR "Gastric Peroral Endoscopic Myotomy"[All Fields] OR "Submucosal Tunnelling Endoscopic Resection"[All Fields] OR "Zenker's Diverticulum"[All Fields]) AND ("Saudi Arabia"[MeSH] OR "Middle East"[All Fields]). No study design or date filters were applied beyond the timeframe to ensure comprehensiveness of the search. The references of the identified articles and review papers were manually cross-checked to identify additional studies not indexed in the databases.

Participant or population • Population: Patients undergoing TSE for gastrointestinal conditions (e.g., achalasia, gastroparesis, subepithelial lesions, and Zenker's diverticulum) at Saudi healthcare institutions or in studies with extractable Saudi-specific subgroups.

Intervention Diagnostic or therapeutic TSE procedures, including POEM, G-POEM, STER, Z-

POEM, or related submucosal tunneling techniques.

Comparator Not required.

Study designs to be included Original research reports, including case reports/series, retrospective or prospective cohorts, and multicenter studies published in English from January 2010 (approximately the start of clinical TSE adoption) to April 2025.Any prospective or retrospective study.

Eligibility criteria The inclusion criteria were based on the PICOS framework (Population, Intervention, Comparator, Outcomes, Study design):
• Population: Patients undergoing TSE for gastrointestinal conditions (e.g., achalasia, gastroparesis, subepithelial lesions, and Zenker's diverticulum) at Saudi healthcare institutions or in studies with extractable Saudi-specific subgroups.
• Intervention: Diagnostic or therapeutic TSE procedures, including POEM, G-POEM, STER, Z-POEM, or related submucosal tunneling techniques.
• Comparator: Not required.
• Outcomes: Technical success (e.g., successful tunnel creation and myotomy/resection), clinical success (e.g., symptom resolution or functional improvement), adverse events (AEs; graded by severity), and procedure-specific metrics (e.g., reflux rates and follow-up data).

Information sources PubMed, Scopus, Google Scholar, and regional academic e-repositories (Saudi Digital Library), in addition to hand-searching the reference lists of articles/reviews identified from January 2010 to April2025.

Main outcome(s)
Clinical success
Adverse events.

Additional outcome(s)
Technical success
Reflux.

Data management Records were imported into reference management software (Mendeley) for deduplication purposes. Two independent reviewers (D.J. and H.M.) screened the titles and abstracts for relevance, followed by a full-text assessment of potentially eligible studies. Disagreements were resolved by consensus, and a third reviewer (S.G.) was consulted if necessary. Reasons for full-text exclusions were recorded (e.g., non-Saudi data, non-English, and not meeting the PICOS inclusion criteria).

Data from eligible studies were independently extracted by two reviewers (D.J. and A.L.) using a standardized electronic form in Microsoft Excel. The extracted elements included bibliographic details (authors, year, design), study characteristics (sample size, institutions, procedure), procedural outcomes, safety metrics, and contextual factors (operator experience, follow-up duration). Disagreements were resolved by consensus, with a third reviewer (A.L.) arbitrating any unresolved issues (none occurred).

Quality assessment / Risk of bias analysis Narrative quality appraisal was completed grouped the findings thematically: procedural adoption, institutional participation, clinical performance, and safety.

Strategy of data synthesis Heterogeneity in outcomes, follow-up, and settings precluded the meta-analysis.

Subgroup analysis N/A.

Sensitivity analysis N/A.

Language restriction Restricted to English.

Country(ies) involved Saudi Arabia.

Keywords Third-Space Endoscopy, NOTES, Peroral Endoscopic Myotomy, G-POEM, Saudi Arabia.

Dissemination plans Publication in the Saudi Medical Journal.

Contributions of each author
Author 1 - Diamond Joy - DJ and HM contributed equally to this work as first authors.
DJ contributed to the study's conception and design; DJ contributed to data acquisition (including title/abstract screening, full-text review, and data extraction). Both continued to data interpretation; drafting of the manuscript; critical revision for important intellectual content.
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Author 2 - Hayat Mushcab - DJ and HM contributed equally to this work as first authors.
HM contributed to the study's conception and design; while HM served as third reviewer for resolving screening and extraction discrepancies; Both continued to data interpretation; drafting of the manuscript; critical revision for important intellectual content and manuscript submission.
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