Journal of Rare Cardiovascular Diseases
ISSN: 2299-3711 (Print) | e-ISSN: 2300-5505 (Online)
www.jrcd.eu
RESEARCH ARTICLE

Comparative Study of Laparoscopic eTEP Rives–Stoppa vs IPOM Repair for Ventral Hernia

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Article History
Received: 21.07.2025
Revised: 16.08.2025
Accepted: 17.09.2025
Published: 28.10.2025

Abstract: ***Background*** Ventral hernias are among the most prevalent abdominal wall defects encountered in general surgical practice, contributing to significant morbidity and healthcare burden. The advent of minimally invasive surgery has transformed abdominal wall reconstruction, with the Enhanced-view Totally Extraperitoneal (eTEP) Rives–Stoppa repair and Intraperitoneal Onlay Mesh (IPOM) repair emerging as leading laparoscopic techniques. While IPOM remains widely practiced for its simplicity, eTEP seeks to replicate the advantages of open Rives–Stoppa repair through extraperitoneal mesh placement, potentially minimizing intraperitoneal complications. This study aims to compare clinical outcomes, complications, and cost-effectiveness between these two approaches. ***Methods*** A retrospective comparative analysis was conducted in the Department of General Surgery, Saveetha Medical College & Hospital, Chennai. A total of 120 patients who underwent elective laparoscopic ventral hernia repair between 2022 and 2024 were included and grouped as eTEP (n = 60) and IPOM (n = 60). Adult patients aged ≥18 years with primary ventral hernias were included. Exclusion criteria were complicated hernias, recurrent hernias, and patients unfit for general anesthesia. Parameters analyzed included operative duration, postoperative pain (VAS >5), surgical site infection, hospital stay (>3 days), total cost, and surgeon acceptability. Data were analyzed using the Chi-square test with $p < 0.05$ considered significant. ***Results*** The mean operative duration was higher for eTEP (>120 minutes in 15 vs. 5 cases; $p = 0.012$). However, eTEP demonstrated significantly lower postoperative pain (VAS >5 in 10 vs. 25 cases; $p = 0.003$), fewer infections (2 vs. 8; $p = 0.045$), and shorter hospital stay (>3 days in 5 vs. 15; $p = 0.022$). Procedural costs were lower for eTEP due to use of standard polypropylene meshes without fixation devices ($p = 0.001$). Surgeon acceptability was higher for IPOM (60 vs. 45; $p = 0.028$). ***Conclusion*** The eTEP Rives–Stoppa approach, though technically demanding and time-consuming, offers superior short-term postoperative outcomes, lesser morbidity, and better cost-effectiveness compared to IPOM repair. Extraperitoneal mesh placement minimizes risks of adhesion, erosion, and chronic pain, establishing eTEP as a promising minimally invasive alternative for ventral hernia repair. Further prospective randomized trials are required to validate these findings and establish standardized surgical guidelines.

Keywords: Ventral hernia, Laparoscopic hernia repair, eTEP Rives–Stoppa, IPOM, Extraperitoneal mesh, Cost-effectiveness

INTRODUCTION

Ventral hernias represent a common surgical problem, encompassing both primary and incisional defects. The standard of care has evolved significantly from open mesh placement to laparoscopic repairs due to reduced postoperative pain, faster recovery, and lower wound-related morbidity. The Intraperitoneal Onlay Mesh (IPOM) technique, described in the early 1990s, involves intraperitoneal mesh placement fixed by tacks or sutures, with the mesh often coated to reduce visceral adhesions. Despite its simplicity and reproducibility, IPOM carries inherent risks such as bowel adhesion, mesh erosion, and long-term chronic pain.

The Enhanced-view Totally Extraperitoneal (eTEP) Rives–Stoppa approach, a more recent innovation, combines the principles of open Rives–Stoppa retromuscular mesh placement with laparoscopic visualization. This technique avoids peritoneal entry and provides an optimal, tension-free extraperitoneal mesh position.

The present study was undertaken to compare laparoscopic eTEP and IPOM techniques in terms of intraoperative efficiency, postoperative outcomes, cost, and surgeon preference within an Indian tertiary care setting.

Material and Methods

A retrospective, comparative study was conducted in the Department of General Surgery, Saveetha Medical College & Hospital (SIMATS), Chennai, over a two-year period (2022–2024). A total of 120 patients undergoing elective laparoscopic repair for primary ventral hernia were analyzed and divided into two groups: eTEP (n=60) and IPOM (n=60). Inclusion criteria included age ≥18 years, primary ventral hernia suitable for laparoscopic repair, and ASA I–II grade. Exclusion criteria were complicated hernias, recurrent hernias, and patients unfit for general anesthesia. Parameters studied included operative duration (>120 minutes), postoperative pain (VAS >5), surgical site infection, hospital stay (>3 days), cost analysis, and surgeon acceptability. Data were analyzed using SPSS v26 with Chi-square test and significance set at $p < 0.05$.

RESULT

Parameter	eTEP (n=60)	IPOM (n=60)	p-value	Inference
Operative Time (>120 min)	15	5	0.012	Longer in eTEP
Postoperative Pain (VAS >5)	10	25	0.003	Less in eTEP
Infection Rate	2	8	0.045	Lower in eTEP
Hospital Stay (>3 days)	5	15	0.022	Shorter in eTEP
Cost (High)	10	35	0.001	Lower in eTEP
Surgeon Acceptability	45	60	0.028	Higher for IPOM

The eTEP group showed significantly better postoperative comfort, fewer infections, reduced hospitalization, and lower cost compared to IPOM. The only drawback was longer operative time due to its technical complexity.

Discussion

Our results demonstrate that laparoscopic eTEP Rives–Stoppa repair offers significant advantages over IPOM in terms of pain reduction, infection rates, and overall cost-effectiveness. These findings are consistent with current evidence and international guidelines favoring extraperitoneal mesh placement.

The reduced pain scores in the eTEP group align with findings from Köckerling et al. (2021) and Belyansky et al. (2018), attributing this to lack of trans-fascial fixation and absence of tacks. Intraperitoneal mesh contact in IPOM carries risk of adhesion, erosion, and fistulation, whereas the eTEP approach preserves a retromuscular plane, preventing these complications.

Although eTEP required longer operative time, this reflects the learning phase and increased technical complexity of retro-rectus dissection. With experience, operating time has been shown to decrease substantially.

Use of standard polypropylene mesh and minimal fixation methods markedly reduces eTEP's procedural costs. In contrast, IPOM requires expensive composite meshes and tackers, increasing intraoperative expenditure. Global evidence supports eTEP as a more physiological, durable, and patient-centered approach for ventral hernia repair.

Conclusion

Laparoscopic eTEP Rives–Stoppa repair, though initially demanding, offers superior short-term outcomes and lower cost when compared to IPOM repair. Its extraperitoneal mesh placement reduces postoperative pain, infection, and hospital stay. With adequate training and familiarity, eTEP represents the next step in minimally invasive ventral hernia surgery. Future multicenter randomized studies are needed to validate these results and refine standardized operative protocols.

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