ADVANCING VENTRAL HERNIA REPAIR: A SYSTEMATIC REVIEW OF MINIMALLY INVASIVE TECHNIQUES

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BACKGROUND

Ventral hernias (VH) are some of the most common pathologies that clinicians see.

- ❖ Laparoscopic ventral hernia repair has been proven to decrease surgical site infection with possible benefits in recurrence and reoperation in small and medium hernia defects
- ❖ The risks & benefits robotic assisted laparoscopic ventral hernia repair has not been clearly reported

In 2017, we published a comprehensive systematic review and consensus statement on the management of patients with ventral hernias[1].

OBJECTIVE

❖The aims of this project were to:

(i) Compare the efficacy of minimally invasive ventral hernia repair techniques, including intraperitoneal onlay mesh (IPOM) and enhanced total extraperitoneal (eTEP) approaches, with a focus on robotic vs. laparoscopic methods.

(ii) identify gaps in the literature

METHODS

❖We performed a PRISMA guided systematic search for randomized controlled trials (RCT) on ventral hernia repair from May 1, 2015 to December 30, 2023 using the following databases: EMBASE, PubMed, Cochrane, ClinicalTrials.gov

❖Search Terms: Hernia and (ventral or incisional or umbilical or epigastric or Spigelian). We included all RCTs on the treatment and management of patients with VH.

❖Pediatric studies, hernia incidence or prevention studies, nonclinical studies, nonhuman studies, editorials/commentaries, and risk factors were excluded.

RESULTS

Of the 723 titles screened, 108 articles (93 studies) met our inclusion criteria. 10 manuscripts across 5 studies targeted minimally invasive techniques. Articles were grouped and analyzed for clinical VHR recommendations.

Key Findings:



No significant difference in overall wound complications (SSI, seroma, hematoma) between robotic (RVHR) and laparoscopic (LVHR) approaches.



Longer operative time observed in robotic procedures, though this was not explicitly analyzed across all studies.



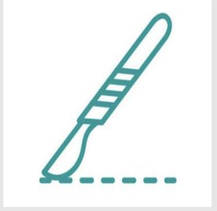
Reoperation rates lower in robotic groups



Quality of life (QoL) improvements with robotic repair



No significant differences in postoperative pain or length of stay (LOS).



Hernia recurrence rates varied:

- Some studies favored **robotic repair for lower recurrence** (e.g., Dhanani18: RR 0.3, P=0.012).
- Other trials reported **higher recurrence rates with robotic IPOM (PROVE-IT trial: 24% vs. 6%, P=0.04).**

CONCLUSIONS

❖Minimally invasive approaches reduce postoperative pain, hospital stay, wound-related complications while maintaining and improving hernia recurrence outcomes.

❖Robotic repair has the potential to reduce recurrence rates

❖Robotic repair may improve ease of fascial defect closure

❖Robotic repair may minimize the foreign body burden and encourage more slowly-absorbable sutures

❖The long-term benefits of robotic surgery continue to unfold, with promising advancements in precision, ergonomics, and patient outcomes.

❖While operative times for new technologies start longer, they improve with experience—robotic VHR, though newer, is advancing rapidly. Just as laparoscopic techniques became more efficient over time, robotic surgery is expected to follow a similar trajectory.

Future projects seek to reach and report an expert consensus on each category. Research investigating the impact on clinical practice as well as hypothesis generating literature concerning complex patients is needed.

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