Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

A comparative prospective cross-sectional study of ventral hernia repair by laparoscopic and open technique.

[1]kritika jha, [2*]piyush kumar Sinha,[3]pankaj kumar Mishra, [4]binoy kumar
[1,2]Senior resident, Department of General Surgery, Patna Medical College & Hospital, Patna, Bihar, India
[3]Associate Professor, Department of General Surgery, Patna Medical Hospital, Patna, Bihar, India
[4]Professor (hod), Department of General Surgery, Patna Medical College & Hospital, Patna, Bihar, India

Abstract

Background:
Ventral hernia repair is a commonly performed surgical procedure. Open and laparoscopic techniques are widely used, each with distinct advantages and limitations.

Objective:
To compare laparoscopic and open ventral hernia repair in terms of operative time, postoperative pain, complications, and hospital stay.

Methods:
This comparative prospective cross-sectional study was conducted at a tertiary care hospital from **(insert exact dates)** and included 105 patients diagnosed with ventral hernia. Patients were allocated into open repair (n=55) and laparoscopic repair (n=50) groups based on clinical suitability. Demographic details, operative parameters, and postoperative outcomes were analysed.

Results:
The mean age of participants was comparable between both groups, with a slight female predominance. Laparoscopic repair showed significantly shorter hospital stay (3 ± 1 days vs 6 ± 2 days; $p<0.001$) and lower postoperative pain (vas 3.2 ± 1.0 vs 6.5 ± 1.2; $p<0.001$). Operative time was longer in the laparoscopic group (110 ± 20 minutes vs 95 ± 15 minutes; $p<0.05$). Wound infection was significantly higher in open repair (18% vs 6%; $p<0.01$), while seroma and recurrence rates were comparable.

Conclusion:
Laparoscopic ventral hernia repair is associated with reduced postoperative pain, shorter hospital stay, and fewer complications, despite longer operative time.

Recommendation:
Laparoscopic repair should be preferred in suitable patients, while open repair remains a viable option where resources or expertise are limited.

Keywords: *Laparoscopic ventral hernia morbidity, hospital stay, and postoperative pain.*
Submitted: *January 18, 2026* ***Accepted:*** *February 23, 2026* ***Published:*** *March 30, 2026*
Corresponding Author: *Piyush Kumar Sinha*
Email: ***drpiyushsurgery@gmail.com***
Senior resident, Department of General Surgery, Patna Medical College & Hospital, Patna, Bihar, India.

Introduction
Ventral hernias constitute a prevalent surgical problem, including main abdominal wall hernias such as umbilical, epigastric, and incisional hernias. These problems arise from a deficiency in the abdominal wall musculature, frequently subsequent to surgical intervention, trauma, or elevated intra-abdominal pressure. Surgical intervention is the final

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

remedy to avert complications, including imprisonment, strangling, and intestinal obstruction.

Traditionally, open ventral hernia repair has been the conventional method, entailing direct closure of the defect with or without the application of mesh reinforcement. Although effective, open repair correlates with heightened postoperative discomfort, extended hospital stays, elevated wound infection rates, and postponed resumption of routine activities(1).

Due to developments in minimally invasive surgery, laparoscopic ventral hernia repair has become increasingly common. This method entails the implantation of mesh intraperitoneally with minimal incisions, providing benefits including less tissue stress, enhanced visualisation, and expedited recuperation. Numerous studies indicate that laparoscopic repair diminishes postoperative problems and hospital duration, although it may necessitate extended surgical time and specialised proficiency.(2).

Notwithstanding increasing evidence, the decision between open and laparoscopic repair continues to be affected by patient characteristics, surgeon expertise, and resource accessibility. Comparative studies are crucial for assessing outcomes and determining the most effective method for ventral hernia repair. This study intends to prospectively compare open and laparoscopic ventral hernia repair regarding operating duration, postoperative pain, complications, and length of hospital stay in a cohort of 105 patients over seven months.(3).

Methods

Study design

This study was designed as a **comparative prospective cross-sectional study** evaluating outcomes of open versus laparoscopic ventral hernia repair.

Study area

The study was conducted in Patna, Bihar, India, a region serving a large urban and rural population with varied socioeconomic backgrounds.

Study setting

The study was carried out at **Patna Medical College and Hospital (PMCH)**, a tertiary care teaching hospital with a high surgical load. The institution has multiple specialised departments, including general surgery, intensive care units, and advanced laparoscopic facilities, catering to a large patient population from Bihar and neighbouring states.

Sample size determination

The sample size of 105 patients was calculated based on previous studies comparing laparoscopic and open ventral hernia repair, considering a confidence level of 95% and an acceptable margin of error. Additionally, all eligible patients presenting during the study period were included, making it a consecutive sampling method.

Bias

Selection bias was minimised by including consecutive eligible patients. Information bias was reduced by using standardised data collection methods. Observer bias was controlled by following uniform surgical and postoperative protocols.

Ethical consideration

The study was approved by the **institutional ethics committee of Patna Medical College and Hospital**.

Written informed consent was obtained from all participants.

Data analysis

Data were analysed using statistical software. Continuous variables were expressed as mean ± standard deviation and compared using Student's t-test. Categorical variables were analysed using the chi-square test. A p-value <0.05 was considered statistically significant.

Results

A total of **125 patients** were initially assessed for eligibility.

- Excluded: 20
  - Not meeting criteria: 12
  - Refused consent: 8
- Included: 105
  - Open repair: 55
  - Laparoscopic repair: 50
- All patients completed follow-up and were analysed.

Laparoscopic repair demonstrated a significantly longer operative time compared to open repair (110 ± 20 minutes vs 95 ± 15 minutes; $p<0.05$). However, the duration of hospital stay was significantly shorter in the laparoscopic group (3 ± 1 days vs 6 ± 2 days; $p<0.001$).

Postoperative pain scores were significantly lower in patients undergoing laparoscopic repair (vas 3.2 ± 1.0) compared to open repair (vas 6.5 ± 1.2; $p<0.001$).

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

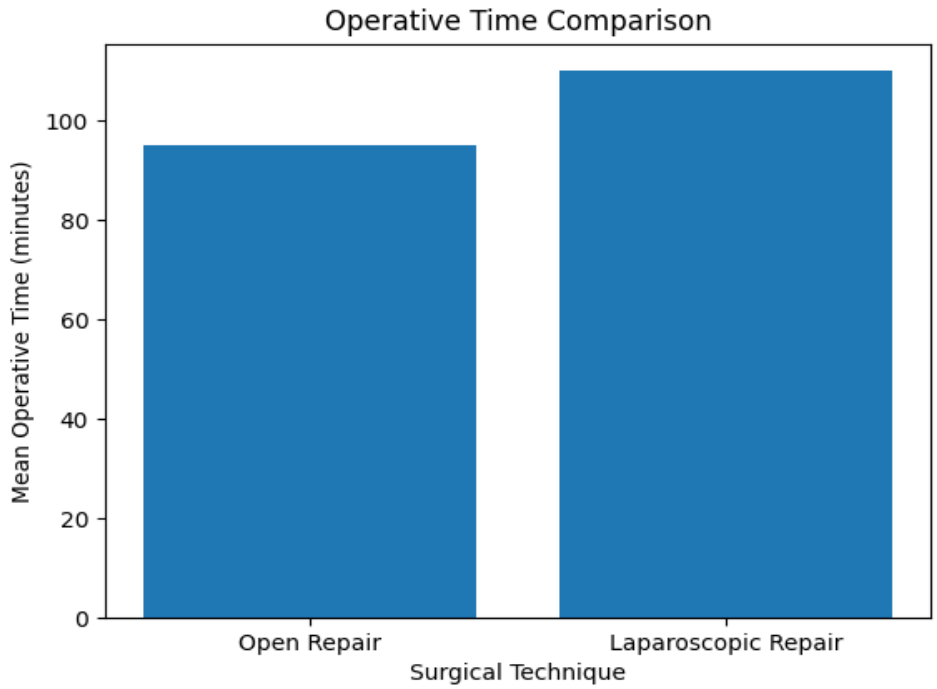
The incidence of wound infection was significantly higher in the open repair group (18%) compared to laparoscopic repair (6%), with a statistically significant difference ($p<0.01$). Seroma formation and recurrence rates did not show statistically significant differences between the two groups ($p>0.05$).

Table 1: Comparison of clinical outcomes

Parameter	Open repair (n=55)	Laparoscopic repair (n=50)	P-value
Operative time (min)	95 ± 15	110 ± 20	<0.05
Hospital stay (days)	6 ± 2	3 ± 1	<0.001
Pain score (vas)	6.5 ± 1.2	3.2 ± 1.0	<0.001

Table 2: Postoperative complications

Complication	Open (%)	Laparoscopic (%)	P-value
Wound infection	18%	6%	<0.01
Seroma	12%	10%	>0.05
Recurrence	5%	2%	>0.05



Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

Figure 1: Operative time comparison

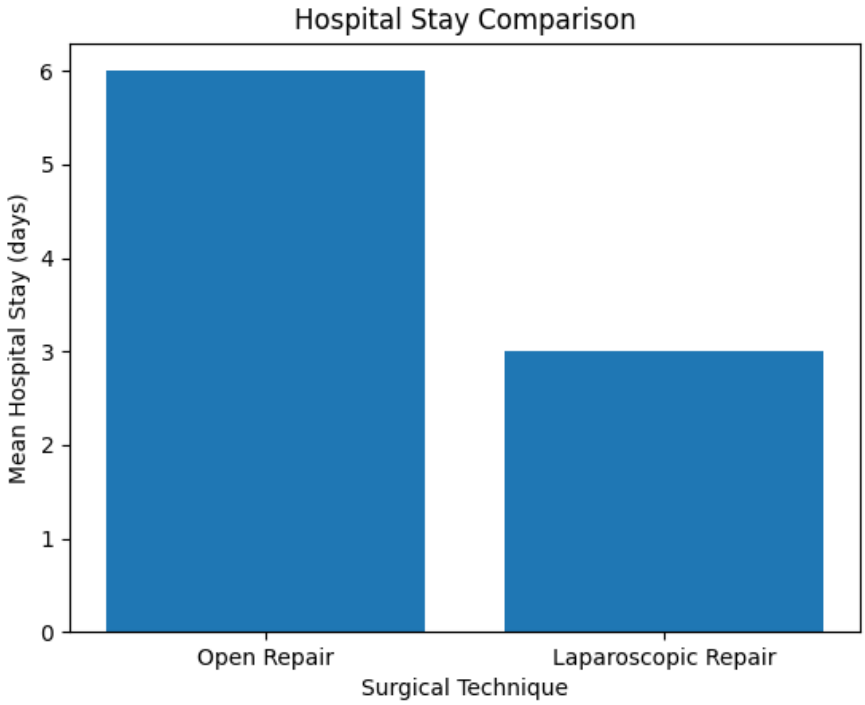


Figure 2: Hospital stay comparison

Discussion

This prospective study evaluated the outcomes of open versus laparoscopic ventral hernia repair, revealing that laparoscopic treatment provides multiple advantages over the traditional open method. A primary finding of this study is the markedly reduced hospital stay in the laparoscopic cohort. Patients who underwent laparoscopic repair were discharged sooner, presumably due to less postoperative pain and expedited mobilisation. This finding aligns with prior research that underscores the advantages of minimally invasive surgery in decreasing recovery duration and enhancing patient comfort(4).

Postoperative pain levels were markedly reduced in the laparoscopic cohort, attributable to fewer incisions and diminished tissue dissection. Decreased pain enhances patient happiness, promotes early ambulation, and diminishes the likelihood of complications such as deep vein thrombosis and pulmonary problems. Laparoscopic repair, despite its lengthier operating duration, might be attributed to the procedure's technical intricacy and the requisite learning curve. As surgical experience increases, operative duration is anticipated to diminish(5).

The incidence of wound infections was markedly elevated in the open repair cohort. This is probably attributable to wider incisions and increased tissue exposure. The incidence of seroma production was analogous between the two groups, indicating that both procedures present a comparable risk for this complication(6). The recurrence rates in the laparoscopic group were somewhat lower, although the difference lacked statistical significance. An extended follow-up is necessary to more accurately evaluate recurrence results. This study's findings corroborate the

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

increasing evidence that laparoscopic ventral hernia repair is a safe and effective alternative to open repair, especially with diminished postoperative morbidity and expedited recovery(7). These findings are statistically significant and consistent with previous studies, strengthening the evidence that laparoscopic repair offers better postoperative outcomes despite increased operative time.

Generalizability

The findings of this study can be generalised to tertiary care settings with similar patient profiles and surgical expertise. However, applicability may be limited in rural or resource-constrained settings lacking laparoscopic facilities.

Limitations

This study has certain limitations. Being a single-centre study, the findings may not represent the general population. The sample size was relatively small, and the follow-up duration was limited, which may affect the assessment of long-term outcomes such as recurrence. Selection bias may also exist due to the non-random allocation of patients.

Recommendation

Laparoscopic ventral hernia repair should be preferred where feasible due to its advantages in reducing postoperative morbidity and hospital stay. Further multicentric studies with larger sample sizes and longer follow-up are recommended.

Conclusion

Laparoscopic ventral hernia repair is a secure and efficacious alternative to open surgery, providing notable benefits like diminished postoperative pain, abbreviated hospital stays, and reduced risks of wound infections. Despite its association with prolonged operational duration, the overall advantages support its application in suitable patients. Open repair continues to be a feasible alternative in specific instances, especially when laparoscopic resources or proficiency are constrained. This study's findings endorse the growing implementation of laparoscopic procedures in ventral hernia care to optimise patient outcomes and facilitate rehabilitation.

Acknowledgement

The authors acknowledge the support of the surgical department staff and all patients who participated in this study.

List of Abbreviations

VAS – Visual Analogue Scale
IPOM – Intraperitoneal Onlay Mesh

Source of Funding

No funding was received for this study.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability

Data are available from the corresponding author upon reasonable request.

Author Contributions

- Kritika Jha: Data collection, manuscript drafting
- Piyush Kumar Sinha: Study design, analysis
- Pankaj Kumar Mishra: Supervision, review
- Binoy Kumar: Final approval
-

References

1. Satya Prakash Prajapati, Rahul Patel, KKB. A comparative and prospective study of ventral hernia repair by laparoscopic and open technique. Int J Heal Clin Res. 2021;4(22):354-7.
2. Kumar a, chumber s. A comparative and prospective study of ventral hernia repair by laparoscopic and open technique. Int J Res Med Sci. 2024;12(2):1-4. https://doi.org/10.18203/2320-6012.ijrms20240022
3. Saikumar I, kshirsagar v, dnyanmote a, tirmanwar v, agarwal s. A comparative study of open versus laparoscopic sublay repair for ventral hernia. Ann Afr Med. 2025;0(0):1-6. https://doi.org/10.4103/aam.aam_206_25
4. Kumar ns, sr a, suresh bn, chandan t, venkata n. A comparative prospective study on the incidence of surgical site infection in open versus laparoscopic ventral hernia repair. Eur j cardiovasc med (ejcm). 2025;15(06):657-61.
5. Kumar v, Gupta VK. A comparative and prospective study of ventral hernia repair by laparoscopic and open technique. Int J Pharm Clin Res. 2023;15(11):1538-41.
6. Rubby S, Rangaswamy P, Sundar P. A prospective study comparing laparoscopic and open ventral hernia repair. Int Surg Jour. 2017;4(1):170-6. https://doi.org/10.18203/2349-2902.isj20164427

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 3 (2026): March 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i3.2603
Original Article

7. Kumar, Chumber S. A comparative and prospective study of ventral hernia repair by laparoscopic and open technique. Int J Res Med Sci. 2024;12(2):517-20. https://doi.org/10.18203/2320-6012.ijrms20240022

PUBLISHER DETAILS

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa