

Comparison and Future Prospects of Ventral Hernia Repair: Laparoscopic Vs. Open Techniques

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Abstract:

Background: This study compares laparoscopic and open ventral hernia repair procedures.

Methods: From January 2022 to December 2023, 40 patients—15 laparoscopic and 25 open—at Jawahar Lal Nehru College & Hospital in Bhagalpur participated in the study. Data on recurrence, postoperative care, and intraoperative care were examined.

Outcomes: Although laparoscopic surgery required more time, it was associated with shorter hospital stays, quicker recovery, and less pain after surgery. In comparison to the open group, they also saw less issues and recurrences after a year.

In conclusion, even though laparoscopic ventral hernia repair takes longer, it is preferred when it can be done because of the better patient results.

Keywords: Surgical Results, Pain Following Surgery, Recurrence Rate, Laparoscopic And Open Ventral Hernia Repair.

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Introduction

One frequent surgical method used to treat hernias in the abdominal wall is ventral hernia repair. Numerous factors, such as congenital abnormalities, prior surgeries, or elevated intra-abdominal pressure, might result in these hernias. Traditional open surgery and minimally invasive laparoscopic surgery are the two main ways to repair ventral hernias. The patient's condition, the surgeon's experience, and the particulars of the hernia can all influence which approach is best. Each approach has pros and cons of its own. [1]

The open method, which has been around for a number of decades, requires a bigger incision in order to reach the hernia and fix it. [2] This technique, which is frequently chosen in complicated or repeated instances, enables an immediate approach to the hernia defect. It does, however, come with a higher risk of wound complications, longer recovery times, and more postoperative pain. [3]

However, the laparoscopic method, which employs specialised tools and a camera to accomplish repairs through small incisions, was introduced in the late 20th century. [4] Shorter hospital stays, a quicker return to normal activities, and less pain after surgery are all associated with this less invasive technique. However, it may not be suitable

for many patients or types of hernias, and it does require advanced surgical methods and instruments. [5]

As surgical techniques and technology progress, it is imperative to evaluate and compare the outcomes of these two approaches. [6] This prospective, comparative study compares laparoscopic and open ventral hernia repairs to assess their respective efficacy, safety, and long-term results. To facilitate optimal decision-making for patients and surgeons about ventral hernia surgery, this study examines multiple variables, such as recurrence rates, patient satisfaction, recovery timeframes, and complication rates. [7]

Methodology

Study Design

The purpose of this prospective, comparative study was to compare the results of laparoscopic versus open ventral hernia repair. The study was conducted at Jawahar Lal Nehru College & Hospital in Bhagalpur over two years, from January 2022 to December 2023.

Patient Selection

The study comprised forty patients who had been diagnosed with ventral hernias. The surgical method employed to correct the hernia in these patients resulted in their division into two groups:

- Laparoscopic group: fifteen individuals
- 25 patients in the open group

Inclusion Criteria

Those who have been diagnosed with a ventral hernia.

- Individuals who have reached the age of eighteen.
- People who agreed to participate in the study after providing informed consent.

Exclusion Criteria

Individuals who should not have laparoscopic surgery.

Individuals who needed a new surgical strategy due to a recurring ventral hernia.

Individuals with serious co-occurring conditions that may compromise surgical results.

Surgical Procedures

Laparoscopic Technique

The individuals in the laparoscopic group had their hernias repaired using standard laparoscopic techniques.

1. This involved the administration of general anaesthesia.
2. Making very small incisions in the abdominal wall.
3. The use of a laparoscope and specific surgical tools.
4. Excision of the hernia's contents and mesh implantation for supporting the abdominal wall.
5. Sealing the incisions with surgical staples or sutures.

Open Technique

The traditional open technique was used to repair hernias in patients in the open group.

1. The administration of local or general anaesthesia was involved in this.

2. Making a deeper cut right above the hernia location.
3. Reduction of the contents of the hernia and defect correction by mesh installation and sutures.
4. Using surgical staples or sutures to seal the incision.

Data Collection

For every patient, information was gathered on a number of factors, such as:

- Demographic information (age, gender)
- The hernia's clinical history and features
- The length of the procedure - Any intraoperative problems
- Analgesic needs and postoperative pain
- Duration of hospital stay - Restart time for regular activities
- Complications following surgery (such as seroma development and wound infection) - Rates of recurrence

Data Analysis

Software for statistical analysis was used to examine the gathered data. The clinical and demographic features of the patients were compiled using descriptive statistics. To assess the variations in the results among the laparoscopic and open groups, a comparative study was carried out. Using the necessary tests, statistical significance was established; a p-value of less than 0.05 was deemed significant.

Ethical Considerations

The Jawahar Lal Nehru College & Hospital's institutional ethics committee gave the study their blessing in Bhagalpur. Before being included in the study, each subject gave their informed consent. Patient data was kept anonymous and confidential for the duration of the investigation.

Results

Forty patients in all with ventral hernias were enrolled in the study and were split into two groups: fifteen underwent laparoscopic hernia surgery and twenty-five got open hernia repair.

Table 1: Provides an overview of the clinical and demographic traits of each group of patients.

| Characteristic | Laparoscopic Group (n=15) | Open Group (n=25) |
|--------------------------|---------------------------|-------------------|
| Age (years) | 45.2 ± 10.3 | 47.8 ± 12.1 |
| Sex (M/F) | 10/5 | 17/8 |
| Hernia size (cm) | 3.5 ± 1.2 | 4.1 ± 1.5 |
| BMI (kg/m ²) | 27.3 ± 3.2 | 28.1 ± 4.0 |

Table 2: The intraoperative outcomes, including the duration of surgery and intraoperative complications, are presented in Table 2.

| Outcome | Laparoscopic Group (n=15) | Open Group (n=25) |
|------------------------------|---------------------------|-------------------|
| Duration of surgery (min) | 95.4 ± 15.6 | 75.2 ± 10.8 |
| Intraoperative complications | 1 (6.7%) | 2 (8.0%) |

The postoperative outcomes, including postoperative pain, length of hospital stay, time to return to normal activities, and postoperative complications, are summarized in Table 3.

Table 3:

| Outcome | Laparoscopic Group (n=15) | Open Group (n=25) |
|--|---------------------------|-------------------|
| Postoperative pain (VAS) | 3.2 ± 1.1 | 5.4 ± 1.5 |
| Length of hospital stay (days) | 2.5 ± 0.7 | 5.8 ± 1.2 |
| Time to return to normal activities (days) | 14.3 ± 3.5 | 25.6 ± 5.4 |
| Postoperative complications | 2 (13.3%) | 6 (24.0%) |
| Wound infection | 1 (6.7%) | 3 (12.0%) |
| Seroma formation | 1 (6.7%) | 2 (8.0%) |

Table 4: The recurrence rates of ventral hernia at the 12-month follow-up are shown in Table 4.

| Outcome | Laparoscopic Group (n=15) | Open Group (n=25) |
|-----------------|---------------------------|-------------------|
| Recurrence rate | 1 (6.7%) | 3 (12.0%) |

Discussion

Both laparoscopic and open ventral hernia repair were compared in this study. With 15 laparoscopic and 25 open surgeries, 40 individuals were studied. The results reveal the pros and cons of each surgical method. [8]

The laparoscopic technique took longer than the open technique (95.4 ± 15.6 minutes vs. 75.2 ± 10.8 minutes). The complexity of laparoscopic procedures and the necessity for specialised equipment make them time-consuming, according to the literature. In institutions where laparoscopic surgery is less common, the learning curve may lengthen operative times. [9]

With one (6.7%) in the laparoscopic group and two (8.0%) in the open group, intraoperative problems were comparatively modest in both groups. This result implies that, in the hands of skilled surgeons, both methods are fairly safe. The types of complications, however, may vary. Although the open technique may provide problems with larger incisions and direct treatment of the hernia site, the laparoscopic approach may pose hazards associated to trocar installation and pneumoperitoneum. [10]

Compared to patients in the open group, those in the laparoscopic group experienced much reduced postoperative discomfort (VAS score 3.2 ± 1.1 vs. 5.4 ± 1.5). This is consistent with the laparoscopic technique's minimally invasive nature, which calls for fewer incisions and less tissue stress. One of the main benefits of laparoscopic surgery is less pain after surgery, which enhances patient comfort and satisfaction. [11]

Comparing to the open group (5.8 ± 1.2 days), the laparoscopic group experienced a shorter hospital

stay (2.5 ± 0.7 days). Short hospital stays are advantageous for patient comfort and convenience as well as for lower healthcare expenses. Patients can return home and resume regular activities sooner because of laparoscopic surgery's quicker recovery. [12]

Individuals who had laparoscopic surgery recovered to their regular activities more quickly than those who had open surgery (14.3 ± 3.5 days vs. 25.6 ± 5.4 days). The functional advantages of the laparoscopic technique, which reduces postoperative discomfort and expedites recovery, are highlighted by this finding. For patients who lead busy lifestyles or who work, a prompt return to normal activities is especially crucial. [13]

Compared to the open group (24.0%), the laparoscopic group saw a reduced risk of postoperative complications (13.3%). In the group that underwent laparoscopic surgery, common problems including seroma development and wound infections also occurred less frequently. The laparoscopic technique's smaller incisions and less invasive nature likely contribute to the lower incidence of complications by lowering the likelihood of wound-related problems. [14]

In comparison to the open group (12.0%), the laparoscopic group had a decreased recurrence rate (6.7%) at the 12-month follow-up. Recurrence is an important outcome metric for hernia repair since it has an immediate effect on how well the surgery works in the long run. The ability to cover larger portions of the abdominal wall using minimally invasive procedures and the careful positioning of the mesh may be the reason for the reduced recurrence rate in the laparoscopic group. [15]

Conclusion

Compared to open surgery, laparoscopic ventral hernia repair has fewer side effects, requires shorter hospital stays, promotes quicker healing, and has a lower recurrence rate. These advantages are supported by a future and comparative analysis. Laparoscopic surgery, however, necessitates longer operating time and more training. Due to its better patient results and quicker recovery, laparoscopic ventral hernia repair may be recommended when it is practical. Further investigations utilising greater sample sizes and extended follow-up periods are required to validate these results and improve surgery for ventral hernia repair.

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