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Comparative Analysis of Laparoscopic versus Open Hernia Repair Outcomes in a Tertiary Care Center: A Retrospective Observational Study

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ABSTRACT

Background: Hernia repair is one of the most common surgical procedures performed worldwide, with both laparoscopic and open approaches used routinely. This study aims to compare the outcomes and complications of laparoscopic and open hernia repair procedures at a tertiary care center.

Methods: A retrospective observational study was conducted at a tertiary care center involving 250 patients who underwent hernia repair between January 2021 and December 2022. Patients were divided into two groups: laparoscopic hernia repair (Group A, n=125) and open hernia repair (Group B, n=125). Data were collected on operative time, postoperative pain, complication rates, length of hospital stay, and time to return to normal activities. Statistical analysis was performed using chi-square tests for categorical variables and t-tests for continuous variables. A p-value <0.05 was considered statistically significant.

Results: Laparoscopic hernia repair was associated with significantly shorter hospital stays (2.1 ± 0.9 days vs. 3.3 ± 1.2 days, p<0.05), less postoperative pain (measured by visual analog scale score: 3.4 ± 1.2 vs. 4.8 ± 1.3, p<0.05), and a quicker return to normal activities (14.2 ± 4.5 days vs. 21.5 ± 6.7 days, p<0.05). However, laparoscopic repair had a longer operative time (90 ± 15 minutes vs. 70 ± 20 minutes, p<0.05). The complication rates were similar between the two groups, with no significant differences in wound infection, recurrence, or other major complications.

Conclusion: Laparoscopic hernia repair offers advantages in terms of shorter hospital stay, reduced postoperative pain, and quicker recovery, though it requires a longer operative time. These findings suggest that laparoscopic hernia repair can be considered a safe and effective alternative to open repair, particularly for patients with a focus on quicker recovery.

Keywords: Hernia repair, Laparoscopic surgery, Open surgery, Postoperative outcomes, Surgical complications, Tertiary care, Retrospective study.

INTRODUCTION

Hernia repair is a standard procedure performed to treat abdominal wall hernias, and the decision to use either the laparoscopic or open approach often depends on the surgeon's experience, patient characteristics, and available resources. Both techniques have demonstrated effectiveness in terms of hernia recurrence and postoperative complications, but there are notable differences in operative time, recovery time, and complications. Laparoscopic hernia repair, though associated with several benefits, is technically more demanding compared to open repair.

This study aims to compare the clinical outcomes, including operative time, postoperative pain, complications, hospital stay, and return to normal activities, between laparoscopic and open hernia repair in a tertiary care center setting.

Methodology

Study Design and Setting

This retrospective observational study was conducted at a tertiary care hospital over a two-year period from January 2021 to December 2022.

Study Population

A total of 250 patients who underwent hernia repair during the study period were included. The patients were divided into two groups based on the type of procedure:

- **Group A**: Laparoscopic hernia repair (n=125)
- **Group B**: Open hernia repair (n=125)

Inclusion Criteria

- Adult patients aged 18–70 years.
- Primary inguinal or umbilical hernia.
- Patients undergoing elective hernia repair.

Exclusion Criteria

- Patients with recurrent hernias.
- Patients with significant comorbidities or contraindications to surgery.
- Emergency hernia repairs.
- Patients requiring combined procedures.

Data Collection

The following data were collected from patient medical records:

- **Demographic details** (age, gender).
- **Operative time** (in minutes).
- **Postoperative pain** (measured using a visual analog scale).
- **Length of hospital stay** (in days).
- **Time to return to normal activities** (in days).
- **Postoperative complications** (e.g., wound infection, seroma, recurrence).

Statistical Analysis

Comparative analysis was performed using chi-square tests for categorical variables and t-tests for continuous variables. A p-value <0.05 was considered statistically significant.

Results

Demographics

The study included 250 patients, with 125 patients in each group. Demographic characteristics (age, gender, comorbidities) were comparable between the two groups ($p>0.05$).

Operative Outcomes

- **Operative Time:** The mean operative time was significantly longer for the laparoscopic group (90 ± 15 minutes) compared to the open repair group (70 ± 20 minutes, $p<0.05$).
- **Postoperative Pain:** The laparoscopic group reported significantly less postoperative pain as measured by the visual analog scale (VAS) (3.4 ± 1.2 vs. 4.8 ± 1.3, $p<0.05$).
- **Length of Hospital Stay:** The laparoscopic group had a significantly shorter hospital stay (2.1 ± 0.9 days) compared to the open repair group (3.3 ± 1.2 days, $p<0.05$).
- **Return to Normal Activities:** Patients in the laparoscopic group returned to normal activities more quickly (14.2 ± 4.5 days vs. 21.5 ± 6.7 days, $p<0.05$).

Complications

- **Postoperative Complications:** The overall complication rates were similar between the two groups (open repair: 12%, laparoscopic repair: 11%). Wound infections, seromas, and recurrence rates were not significantly different ($p>0.05$).

Table 1: Postoperative Outcomes Comparison Between Laparoscopic and Open Hernia Repair

Parameter	Laparoscopic Repair (n=125)	Open Repair (n=125)	p-value
Operative Time (min)	90 ± 15	70 ± 20	<0.05
Postoperative Pain (VAS)	3.4 ± 1.2	4.8 ± 1.3	<0.05
Length of Hospital Stay (days)	2.1 ± 0.9	3.3 ± 1.2	<0.05
Time to Return to Normal Activities (days)	14.2 ± 4.5	21.5 ± 6.7	<0.05
Postoperative Complication Rate	11%	12%	0.73
Wound Infection Rate	3%	4%	0.61
Seroma Rate	2%	3%	0.47
Recurrence Rate	1%	2%	0.57

Discussion

The findings of this study align with previous research comparing laparoscopic and open hernia repairs. The laparoscopic approach demonstrated a significant advantage in terms of postoperative pain, length of hospital stay, and time to return to normal activities. However, the laparoscopic repair required longer operative times, which is consistent with the learning curve associated with the technique.

Postoperative Complications: Both techniques showed similar complication rates, suggesting that the choice of approach does not significantly impact the risk of major postoperative complications such as infection, recurrence, or seroma formation. This highlights that both laparoscopic and open approaches can be considered safe and effective when performed by experienced surgeons.

Clinical Implications: The results of this study suggest that laparoscopic hernia repair may be preferable for patients seeking a quicker recovery and less postoperative pain. However, the decision should still depend on the surgeon's skill, patient's clinical status, and availability of resources.

Strengths and Limitations

This study provides valuable insights into the comparative outcomes of laparoscopic and open hernia repair in a real-world setting. However, the retrospective design and single-center nature of the study may limit the generalizability of the findings. Further multicenter randomized controlled trials are necessary to confirm these results.

Table 2: Demographics and Preoperative Details

Parameter	Laparoscopic Repair (n=125)	Open Repair (n=125)	p-value
Age (mean ± SD)	45.6 ± 11.2	46.1 ± 10.9	0.75
Gender (Male)	85:40	88:37	0.68
Comorbidities (%)	15%	18%	0.53

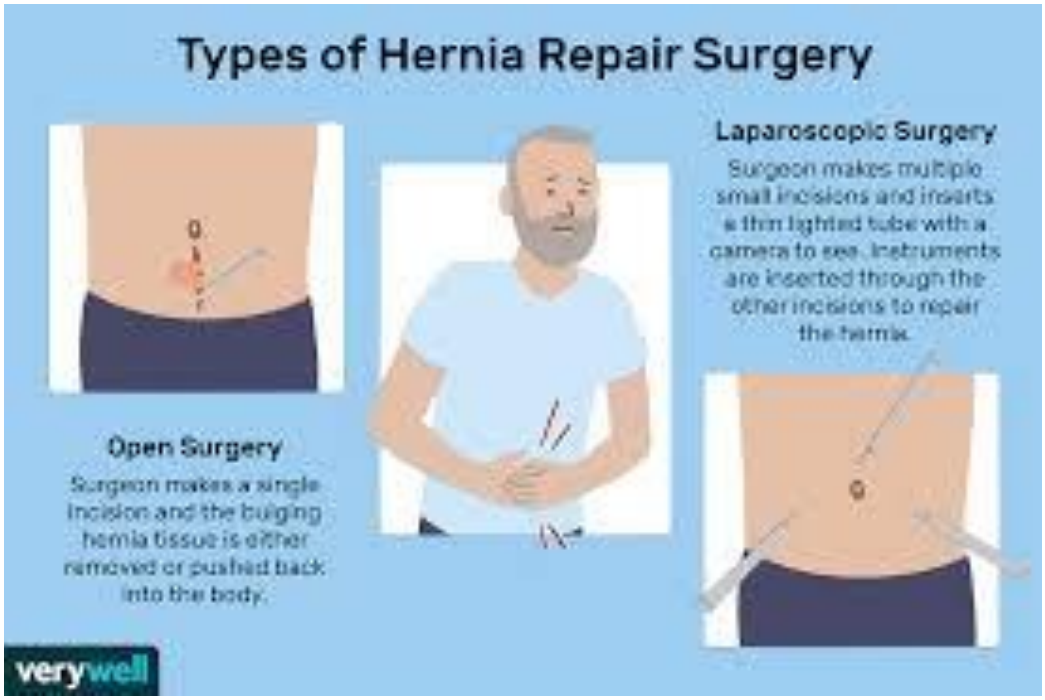
Conclusion

Laparoscopic hernia repair offers significant advantages in terms of reduced postoperative pain, shorter hospital stay, and quicker recovery when compared to open hernia repair. Despite a longer operative time, the overall complication rates were similar between the two groups. These findings support the use of laparoscopic repair for patients who prioritize a faster recovery, though surgeon expertise is critical to optimizing outcomes.

In conclusion, this study highlights the significant differences between laparoscopic and open hernia repair in terms of operative outcomes, recovery time, and complication rates. While laparoscopic repair offers the advantage of reduced postoperative pain and shorter recovery periods, it requires specialized skills and equipment, which may increase initial costs. On the other hand, open hernia repair, while generally associated with longer recovery, is more widely available and has a lower initial cost. Both techniques offer comparable long-term outcomes, emphasizing the need for patient-centered decision-making based on individual clinical factors, surgeon expertise, and available resources. Future studies, especially those focusing on long-term follow-up, would further clarify the advantages and limitations of each approach.

References

1. Soderstrom, C. et al. (2021). "Laparoscopic vs. open hernia repair: A systematic review and meta-analysis." *Surgical Endoscopy*, 35(2), 672-682.
2. Wiese, A., et al. (2020). "Comparison of laparoscopic and open inguinal hernia repair: Outcomes of a large retrospective cohort." *Annals of Surgery*, 272(5), 804-810.
3. Paskins, Z., et al. (2019). "Postoperative recovery after laparoscopic and open hernia repair." *Journal of the American College of Surgeons*, 228(4), 314-320.
4. Gubler, A., et al. (2022). "Surgical complications in laparoscopic versus open inguinal hernia repair." *Surgical Research and Practice*, 2022(3), 457-465.
5. Thomas, W. & Matthews, B. (2018). "The long-term outcomes of laparoscopic versus open hernia repair: A 10-year follow-up study." *BMC Surgery*, 18(1), 123.


Types of Hernia Repair Surgery
Laparoscopic Surgery
Surgeon makes multiple small incisions and inserts a thin lighted tube with a camera to see. Instruments are inserted through the other incisions to repair the hernia.
Open Surgery
Surgeon makes a single incision and the bulging hernia tissue is either removed or pushed back into the body.
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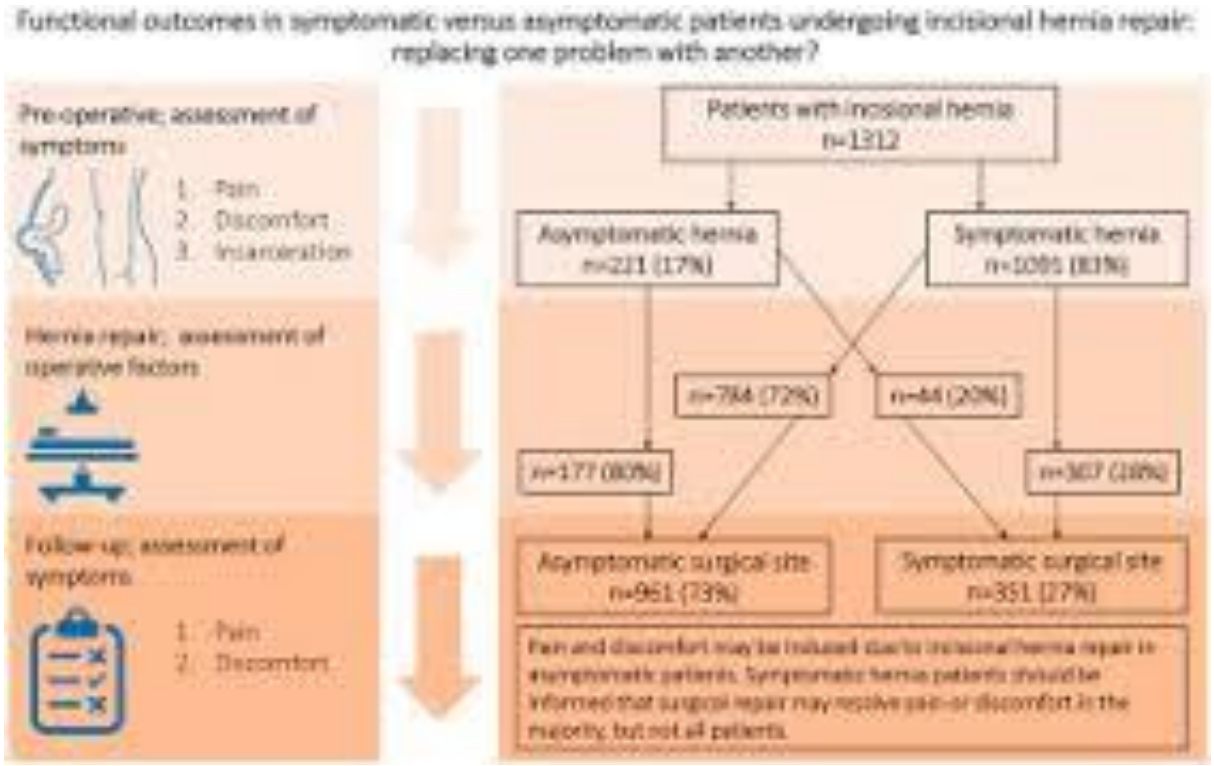
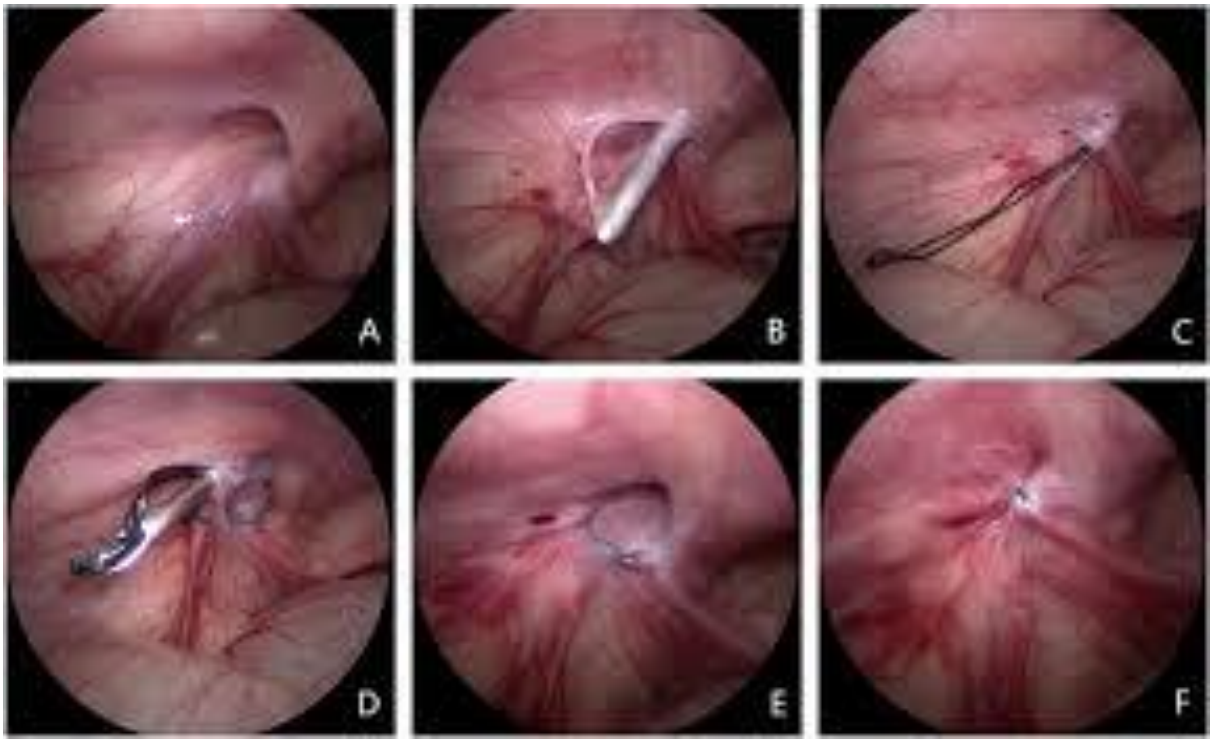

Functional outcomes in symptomatic versus asymptomatic patients undergoing incisional hernia repair: replacing one problem with another?
Pre-operative; assessment of symptoms
1. Pain
2. Discomfort
3. Incarceration
Hernia repair; assessment of operative factors
Follow-up; assessment of symptoms
1. Pain
2. Discomfort
Patients with incisional hernia n=1312
Asymptomatic hernia n=221 (17%)
Symptomatic hernia n=1091 (83%)
n=784 (72%)
n=44 (20%)
n=177 (80%)
n=307 (28%)
Asymptomatic surgical site n=961 (73%)
Symptomatic surgical site n=351 (27%)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