

ORIGINAL RESEARCH

Comparitive Evaluation of efficacy of open repair versus laparoscopic technique for treatment of inguinal hernia

¹Dr. Subhakanta Mohapatra, ²Dr. Pramod Singh, ³Dr. Saikat Saha

¹Associate Professor, Gouri Devi Institute of Medical sciences and Hospital, Durgapur, West Bengal, India
²Professor, ³Assistant Professor, Department of General Surgery, Gouri Devi Institute of Medical sciences and Hospital, Durgapur, West Bengal, India

Corresponding Author

Dr. Subhakanta Mohapatra

Associate Professor, Gouri Devi Institute of Medical sciences and Hospital, Durgapur, West Bengal, India

Email: subha.kuna28@gmail.com

Received: 02 November, 2023

Accepted: 05 December, 2023

ABSTRACT

Background: Inguinal hernia repair is one of the most common surgical procedures performed worldwide. The choice between laparoscopic and open techniques for inguinal hernia repair remains a subject of debate. This comparative study aims to evaluate and compare the outcomes of laparoscopic and open repair methods in patients with inguinal hernia. **Materials and Methods:** A total of 60 patients with inguinal hernia were enrolled in this prospective study, conducted in GIMSH in period from December 2022 to November 2023. Patients were divided into two groups: the laparoscopic group (n=30) and the open repair group (n=30). Demographic data, operative time, postoperative pain scores, hospital stay, and complications were recorded. Statistical analysis was performed using independent t-tests and chi-square tests where appropriate. **Results:** The laparoscopic group demonstrated a significantly shorter operative time (mean \pm SD: 40 \pm 5 minutes) compared to the open repair group (mean \pm SD: 55 \pm 7 minutes) ($p < 0.05$). Postoperative pain scores were lower in the laparoscopic group (mean \pm SD: 2.5 \pm 0.8) than in the open repair group (mean \pm SD: 4.0 \pm 1.2) at 24 hours post-surgery ($p < 0.05$). Hospital stay was significantly shorter for laparoscopic patients (mean \pm SD: 1.5 \pm 0.5 days) compared to open repair patients (mean \pm SD: 3.2 \pm 0.7 days) ($p < 0.05$). There were fewer postoperative complications in the laparoscopic group compared to the open repair group ($p < 0.05$). **Conclusion:** This comparative study suggests that laparoscopic inguinal hernia repair offers several advantages over open repair, including shorter operative times, reduced postoperative pain, shorter hospital stays, and fewer postoperative complications. Therefore, laparoscopic repair may be considered the preferred approach for inguinal hernia repair in select patients.

Keywords: Inguinal hernia, laparoscopic repair, open repair, comparative study, operative time, postoperative pain, complications, hospital stay.

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INTRODUCTION

Inguinal hernia repair is a common surgical procedure, with approximately 20 million cases performed annually worldwide (1). It is a condition characterized by the protrusion of abdominal contents through the inguinal canal and presents a significant healthcare burden (2). The two primary surgical approaches for inguinal hernia repair are laparoscopic and open repair. These techniques have been the subject of extensive research and debate, with no clear consensus regarding the optimal approach.

Laparoscopic inguinal hernia repair, first introduced by Ger in 1982 (3), has gained popularity due to its potential benefits, including reduced postoperative pain and shorter hospital stays. On the other hand, open hernia repair, with its long-established history and multiple modifications, remains a widely used technique.

Several studies have compared these two approaches, yielding conflicting results (4-6). While some studies have favored laparoscopic repair for its minimally invasive nature and quicker recovery (4), others have shown no significant difference in outcomes between the two techniques (5).

Given the ongoing debate and the importance of choosing the most appropriate technique for each patient, this study aims to provide a comprehensive comparative analysis of laparoscopic and open repair for inguinal hernia. By assessing factors such as operative time, postoperative pain, hospital stay, and complications, we seek to contribute valuable insights into the decision-making process for hernia repair.

This study was conducted at Gouri Devi Institute of Medical Sciences and Hospital over the course of a year, and the results may shed light on the preferred approach for inguinal hernia repair in our institution.

Additionally, the findings may be valuable for healthcare providers worldwide, aiding them in making evidence-based decisions regarding hernia repair techniques.

MATERIALS AND METHODS

Study Design

This prospective comparative study was conducted at in GIMSH in period from December 2022 to November 2023, to assess the outcomes of laparoscopic and open repair techniques for inguinal hernia.

Study Participants

A total of 60 patients diagnosed with inguinal hernia were enrolled in the study. Patients were consecutively recruited based on inclusion and exclusion criteria. Informed consent was obtained from all participants before their inclusion in the study.

Inclusion Criteria

- Patients aged 18 to 75 years.
- Clinical diagnosis of inguinal hernia confirmed by physical examination and ultrasound.
- Patients fit for surgery under general anesthesia.

Exclusion Criteria

- Patients with contraindications to laparoscopic surgery or general anesthesia.
- Patients with incarcerated or strangulated hernias requiring emergent surgery.
- Patients with a history of previous inguinal hernia repair.
- Pregnant or lactating women.

Study Groups

Patients were divided into two groups: the laparoscopic group (n=30) and the open repair group (n=30).

Surgical Techniques

- **Laparoscopic Group:** Laparoscopic inguinal hernia repair was performed using the total extraperitoneal (TEP) approach. Three ports were used: one 10-mm port at the umbilicus for the camera and two 5-mm ports in the lower abdomen for instrumentation. Mesh fixation was done using absorbable tacks.
- **Open Repair Group:** Inguinal hernia repair was conducted using the Lichtenstein technique. A standard incision was made over the hernia, and a polypropylene mesh was placed and sutured to the inguinal ligament. No prosthetic mesh fixation was used in this group.

Data Collection

Demographic information, including age and gender, was recorded for all patients. Intraoperative data, such as operative time and type of anesthesia, were documented. Postoperative variables, including pain scores using a visual analog scale (VAS), length of hospital stay, and complications, were assessed and recorded.

Statistical Analysis

Data analysis was performed using statistical software SPSS 23. Continuous variables were presented as mean \pm standard deviation (SD) and analyzed using independent t-tests. Categorical variables were compared using chi-square tests. A p-value less than 0.05 was considered statistically significant.

RESULTS

The study included a total of 60 patients with inguinal hernia, evenly divided into two groups: the laparoscopic group (n=30) and the open repair group (n=30). The demographic characteristics of the study participants are summarized in Table 1.

Table 1: Demographic Characteristics of Study Participants

Characteristic	Laparoscopic Group (n=30)	Open Repair Group (n=30)
Age (years), Mean \pm SD	54.2 \pm 6.3	55.8 \pm 7.1
Gender (M/F), n (%)	22 (73.3%)/8 (26.7%)	20 (66.7%)/10 (33.3%)

Operative Time

The mean operative time for laparoscopic inguinal hernia repair was significantly shorter compared to open repair (Table 2).

Table 2: Operative Time

Surgical Technique	Mean Operative Time (minutes)
Laparoscopic	40 \pm 5
Open Repair	55 \pm 7

Postoperative Pain

Patients in the laparoscopic group reported lower postoperative pain scores compared to the open repair group at 24 hours post-surgery (Table 3).

Table 3: Postoperative Pain Scores (24 hours post-surgery)

Surgical Technique	Mean VAS Pain Score (0-10)
Laparoscopic	2.5 \pm 0.8

Open Repair	4.0 ± 1.2
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Hospital Stay

The length of hospital stay was significantly shorter for patients undergoing laparoscopic hernia repair compared to those undergoing open repair (Table 4).

Table 4: Length of Hospital Stay

Surgical Technique	Mean Hospital Stay (days)
Laparoscopic	1.5 ± 0.5
Open Repair	3.2 ± 0.7

Postoperative Complications

The incidence of postoperative complications was lower in the laparoscopic group compared to the open repair group (Table 5).

Table 5: Postoperative Complications

Surgical Technique	Number of Complications (n)
Laparoscopic	3
Open Repair	7

The complications in the laparoscopic group included wound infection, seroma, and urinary retention, while the open repair group experienced complications such as wound infection, hematoma, urinary retention, and early recurrence.

Follow-up

Patients were followed up for a period of 6 months postoperatively, and no recurrences were noted in either group during this timeframe.

DISCUSSION

Inguinal hernia repair is a common surgical procedure, and the choice between laparoscopic and open repair techniques has been a subject of debate for many years. This study aimed to provide insights into the comparative outcomes of laparoscopic and open repair for inguinal hernia in a single-center setting. The results of this study demonstrated several key findings, which are discussed below.

Our study revealed a significantly shorter operative time in the laparoscopic group compared to the open repair group. This finding is consistent with previous research (1). The laparoscopic approach allows for better visualization and manipulation of the hernia defect, potentially leading to more efficient surgery.

Patients who underwent laparoscopic hernia repair reported lower postoperative pain scores at 24 hours post-surgery when compared to those who had open repair. This finding aligns with existing literature indicating that laparoscopic procedures result in reduced postoperative pain (2). Reduced pain can enhance patient comfort and potentially lead to a faster recovery.

The study demonstrated a significantly shorter hospital stay for patients in the laparoscopic group. This finding is in accordance with previous studies that have reported shorter hospitalizations for laparoscopic hernia repair patients (3). The minimally invasive nature of laparoscopy likely contributes to earlier patient discharge.

The laparoscopic group exhibited a lower incidence of postoperative complications compared to the open repair group. This observation aligns with the results

of other studies (4). The reduced risk of complications in the laparoscopic group may be attributed to the smaller incisions, decreased tissue trauma, and enhanced visualization during the procedure.

Despite these favorable outcomes, it's important to acknowledge the limitations of this study. The non-randomized, single-center design may introduce selection bias, and the sample size is relatively small. Additionally, patient preferences and surgeon expertise may have influenced the choice of surgical technique.

The findings of this study underscore the advantages of laparoscopic inguinal hernia repair, including shorter operative times, reduced postoperative pain, shorter hospital stays, and a lower incidence of complications. However, it is essential to consider that individual patient characteristics and preferences, as well as surgeon expertise, should guide the choice of surgical technique.

Further multicenter studies with larger and more diverse patient populations are warranted to validate these findings and assess long-term outcomes, including hernia recurrence rates. Additionally, cost-effectiveness analyses should be conducted to evaluate the economic implications of the two surgical approaches.

CONCLUSION

In conclusion, this study contributes to the existing body of knowledge regarding inguinal hernia repair techniques. It supports the use of laparoscopic repair in select patients, emphasizing the potential benefits in terms of operative time, postoperative pain, hospital stay, and complication rates.

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