

Comparative Study between Open and Laproscopic Inguinal Hernia Repair

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Abstract: *Background:* Inguinal hernia is a common surgical problem around the globe. The prevalence of the inguinal hernia is notably higher in males. Recently, laparoscopic hernia repair has become more popular, with the decreased frequency of chronic post-operative pain. This study aims to distinguish between open and laparoscopic approaches to inguinal hernia surgery. *Methods:* This prospective observational study included 47 inguinal hernia patients from the In-patient ward of General Surgery of Raipur Institute of Medical Sciences, Raipur, Chhattisgarh. Visual analog scales (VAS) were used for post operative pain assessments. All the statistical analysis were done by using SPSS software version 24.0, and p-value less than 0.05 was considered as significant. *Results:* In present study, among the 47 patients, the majority of patients were from ages group 50 to 60 years, and mean age was 49.07 (± 12.95) years. Findings revealed that the average time taken to complete a laparoscopic hernia repair (105.3 ± 16.2 mins) was significantly higher (p -value < 0.001) compared to open hernia repair (27.5 ± 6.9 mins). The mean postoperative pain scores (VAS) were found more with open hernia repair compared to laparoscopic procedure. The time taken for return to work was earlier in patients treated with laparoscopic hernia repair (4 days) compared to open surgery (7 days). *Conclusions:* Study concluded that laparoscopic hernia repair has been found to be superior to open surgery in term post-operative discomfort, and an earlier return to work. To evaluate chronic discomfort and recurrence rates after laparoscopic hernia repair, further studies and follow-up are required.

Keywords: Inguinal hernia, laparoscopic hernia repair, open surgery

1. Introduction

Inguinal hernias are common surgical conditions, which have grown into frequent surgical problems. The approach to their repair has changed in the past few decades with continued research in this field. There are two main types of groin hernias: femoral and direct and indirect inguinal. Through an open internal inguinal ring, the peritoneum with or without peritoneal contents can protrude laterally to the inferior epigastric veins resulting in what is referred to as an indirect hernia most often encountered [1, 2].

Over the last twenty years, hernioplasty, a standard general surgery procedure that was previously managed using an open technique has been revolutionized by means of minimally invasive surgery [3, 4]. For males these may be located along the spermatic cord extending onto the scrotum while for females they may track along with round ligament up to labia majora [5]. In particular, abdominal wall hernias occur commonly overall prevalence of 1.7% and 4% in people aged over 45 years old. In fact, about 75% of abdominal wall hernias are inguinal hernias that happen to approximately 27 % of men and only about 3% among women at any time during their lifespan [6].

Lichtenstein's tension-free Inguinal Hernioplasty is the preferred method of open inguinal hernia repair that uses a prosthetic mesh. Compared to tissue repairs, which can have recurrence rate as high as 15%, this technique has less than 1% recurrence rate in experienced hands. Morbidity following surgery is low and patients recover quickly [7]. Laparoscopy is commonly being used in modern day surgery. The advantages and efficacy of laparoscopic surgery over open surgery are well-documented, rendering it the gold standard for handling gallstone disease. Several studies have reported on the benefits of laparoscopic hernioplasty (LH) compared with open hernioplasty (OH), including lower postoperative pain scores and morbidity rates, fewer wound

complications, earlier return to activity and work, better cosmetic results and improved patient satisfaction [8-10]. However, it has drawbacks such as increased operative time, steep learning curve, higher hospital costs, potential for severe accidents and higher early postoperative period recurrence rates compared to open surgery. There are two ways of performing laparoscopic hernioplasty: trans-abdominal preperitoneal repair (TAPP) and totally extraperitoneal repair (TEP). In this type, the peritoneal cavity is not violated, which makes it similar to open hernioplasty and eliminates intraoperative injuries. The intention of present study is to evaluate the open and laparoscopic approaches to inguinal hernia surgery in terms of surgical duration, seroma formation, length of hospitalization, and recovery time before returning to regular activity.

2. Materials and Methods

A prospective comparison study was conducted in the indoor patients of General surgery ward at Raipur Institute of Medical Sciences, Raipur, Chhattisgarh and its associated hospitals from May 2022 to April 2023. In present study, 47 patients with Inguinal Hernia from the In-patient ward of General Surgery were included. The selection of cases was based on clinically diagnosis and USG findings. Patients with obstructed hernia were excluded from the study.

The study comprised patients with inguinal hernias who agreed to laparoscopic and open hernia surgery. Two groups of patients undergoing open and laparoscopic repairs were observed for the study. The patients were brought in for surgery, and the duration of the procedure was recorded. Patients were treated with appropriate analgesics following surgery, mostly non-steroidal anti-inflammatory drugs (NSAIDs) with no contraindication, and the pain was evaluated utilizing the Visual Analogue Scale (VAS). An analysis of pain was done 12 hours, 24 hours, and 48 hours after surgery. The patients were clinically evaluated for any

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mesh displacement before discharge.

Statistical analyses were performed in order to determine the difference in the responses of the patients. The categorical demographic variables and clinical parameters were presented as percentage and frequency. The continuous demographic variables like age, pain score etc. were presented as mean and standard deviation (SD). Independent samples t-test was performed to identify the statistical significance in the difference of the mean value of the various responses. All the statistical analyses were performed using SPSS version 24 software.

3. Results

A total 47 patients were included in the study out of which open hernia repair (Group A) had 30 patients and laparoscopic hernia repair (Group B) had 17 patients. The mean age of the patients in two groups were compared. The maximum age of patient included in the study was 77 years and the minimum age was 22 years. Majority of patients were from ages group 50 to 60 years (Table 1). The mean age of studied population 49.07 (± 12.95) years. The mean age difference between the two groups was statistically insignificant (p value = 0.784).

Table 1: Age wise distribution of studied subjects

Age (Years)	No. of patients	%
21 – 30	7	14.9
31 – 40	4	8.5
41 – 50	11	23.4
51 – 60	19	40.4
Above 60	6	12.8
Total	47	100

Table 2: Distribution of inguinal hernias based on side among the groups

Side of inguinal hernia	Group A (n=30)	Group B (n=17)	Total (n=47)
Bilateral	0 (0.0%)	1 (5.9%)	1 (2.1%)
Left	8 (26.7%)	5 (29.4%)	13 (27.7%)
Right	22 (73.3%)	11 (64.7%)	33 (70.2%)
Total	30 (100%)	17(100%)	47 (100%)

The distribution of inguinal hernias based on side was compared between the groups. The number of right-side hernias was found to be more in Group A. The bilateral hernia was found in only one patient (Table 2). There was no statistically significant difference between two groups (p -value = 0.385), indicated equally well matched for side of hernia.

Table 3: Mean operative time between two groups

Time (mins)	Group A	Group B	P-value
Mean	27.50	105.29	<0.001
SD	6.92	16.25	

The mean operative time for Group A was 27.50 (± 6.92) mins and that for Group B was 105.29 (± 16.25) mins (Table 3). Thus, the mean time taken to complete a laparoscopic hernia was significantly higher (p -value <0.001) than the time to complete the open hernia surgery.

Table 4: Mean postoperative pain score (VAS) among the groups

Time	Group A	Group B	P-value
12 hrs	3.90 \pm 0.71	2.12 \pm 1.11	<0.001
24 hrs	3.13 \pm 0.68	1.59 \pm 1.23	<0.001
48 hrs	2.90 \pm 0.66	1.53 \pm 1.01	<0.001

The mean postoperative pain score (VAS) of Group B were found lower at 12 hrs, 24 hrs and 48 hrs than that of Group A (Table 4). The difference mean pain score between two groups was found to be statistically significant (P -value<0.001). These findings indicated that laparoscopic hernia repair caused significantly less pain compared to open hernia repair.

Table 5: Comparisons of incidences among the groups

Variables	Group A (n=30)	Group B (n=17)	Total (n=47)
Seroma	7 (23.3%)	0 (0%)	7 (14.9%)
Infection	0 (0%)	1 (5.9%)	1 (2.1%)
Hematoma	0 (0%)	0 (0%)	0 (0%)

The number of seromas after open hernia surgery was 7 (23.3%), whereas, no seromas formation was observed after laparoscopic hernia repair. Infection was found in only patient (Table 5).

Table 6: Comparison of return to work (days) between the groups

Return to work (Days)	Group A	Group B	P-value
Mean \pm SD	7.17 \pm 0.75	4.35 \pm 0.99	<0.001

The recovery times for open and laparoscopic repairs were 7.17 days and 4.35 days respectively (Table 6). Laparoscopic hernia repair required significantly less recovery time and early return to work than open hernia repair (p -value<0.001).

4. Discussion

Laparoscopic hernia repair has improved the surgical hernia patient's management, importantly reducing morbidity associated with open hernia repair. Currently, laparoscopic hernia repair has gained clinical significance, especially in cases of recurrent hernias, demonstrating no postoperative surgical weaknesses. In this study, the time required for laparoscopic hernia repair exceeded that of open hernia repair, while the time for direct hernia repair was shorter than that for indirect hernias in both groups. This aligns with the findings of Bringman et al. and Go [11, 12]. However, the laparoscopy group exhibited significantly less time needed for daily activities and return to work, making the argument for longer surgical time less substantial [13, 14].

No major complications were observed in either group, and the study indicated a nonsignificant difference between the two groups, consistent with observations by Ramshaw et al [15]. Postoperative pain following laparoscopic hernia repair was lower at 12 hrs, 24 hrs, and 48 hrs compared to open hernia repair, and this difference was statistically significant. This may be attributed to reduced incision size, avoiding extra or bilateral incisions in bilateral hernias, minimal dissection, and less manipulation of cord structures. Similar findings were reported by Fujita et al., and Pokorny et al. [16, 17] based on Visual Analog Scale (VAS) scores and the need for additional analgesics.

The main drawbacks to laparoscopic hernia repair were mesh displacement in the early postoperative period and early recurrence. This study revealed that the recovery time for open and laparoscopic repairs was 7.17 days and 4.35 days, respectively. Laparoscopic hernia repair required significantly less recovery time and facilitated an earlier return to work compared to open hernia repair (p -value < 0.001). The faster return to work was attributed to reduced postoperative pain and fewer chances of cord edema. These findings were consistent with previous studies, particularly those by Lal et al. [18]. Seroma formation after open hernia surgery occurred in 23.3% of cases, whereas no seromas were observed after laparoscopic hernia repair. Infection was found in only one patient, similar to the results reported by Winslow et al. [19]. Overall, laparoscopic procedures tended to yield better outcomes in terms of quick recovery.

5. Conclusion

In conclusion, laparoscopic hernia repair is a safe option with reduced postoperative morbidity. It offers numerous advantages over open hernia repair, including an early return to work and improved subjective and objective cosmetic outcomes. However, it comes with certain limitations, such as a longer operative time. Therefore, in inguinal hernias, especially in cases of bilateral, the laparoscopic approach is recommended.

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