

Comparative Study of Open Hernia Repair (Lichtenstein) versus Laparoscopic (TAPP) Mesh Repair for Inguinal Hernia**Rahul Ranjan¹, Rajendra Kumar², Priyanka Kumari³**¹Senior Resident, Department of General Surgery, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India²Assistant Professor, Department of Surgery, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India³Senior Resident, Department of Obstetrics and Gynaecology, Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India

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Abstract**Aim:** The study compares open hernia repair and laparoscopic surgery (TAPP) mesh repair in recovery time, discomfort, intra- and post-operative complications, recurrence, and time to resume regular activities.**Methods:** Lichtenstein's open mesh repair and laparoscopic hernioplasty (TAPP) were compared in the general surgery department at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India for 1 year. 120 individuals with unilateral or bilateral inguinal hernias were randomized. The length of the procedure, intra- and post-operative issues, hospital stay, recurrence, discomfort, and time to return to regular activities were compared.**Results:** The 120 participants were 100 (84.71%) men and 20 (13.29%) women. The mean age for open mesh repair was 52.06 and laparoscopic surgery 49.45. Unilateral hernia was found in 95 patients and 25 patients had bilateral inguinal hernias. Among bilateral hernias Fifteen open mesh and ten laparoscopic bilateral hernia patients were treated. Among unilateral hernias, open mesh repair and laparoscopic hernioplasty were performed on 56 and 39 patients, respectively. The typical bilateral open hernioplasty took 87.26 minutes and unilateral 46.55. Unilateral laparoscopic hernioplasty took 120.45 and 62.48 minutes. The open hernioplasty group developed 16.9% seroma (12/71) and 14.08% (10/71) wound infection. 4.08% (2/49) of laparoscopic hernioplasty patients suffered wound infection, but 12.24% (6/49) developed seroma. Open hernioplasty had 14 urinary retention instances, laparoscopic 6.14%. Laparoscopic and open hernioplasty (LH and OH) exhibited mean pain scores of 5.1 and 6.6 on POD 0 and 4.2 and 5.1 on POD 3. LH pain was 1.7 and OH 3.0 on POD 7.**Conclusion:** Skilled laparoscopic hernia repair is safer and has less post-operative morbidity than open surgery. Less postoperative morbidity makes laparoscopic inguinal hernia repair the preferred procedure; long-term outcomes and affordability of laparoscopic versus open hernia surgery should be investigated to guide treatment choices.**Keywords:** Lichtenstein's repair, Inguinal hernia, Laparoscopic hernioplasty.

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Introduction

A hernia occurs when an organ or fatty tissue protrudes through a weak wall in the body. One common surgical technique is the correction of an inguinal hernia. Over time, the understanding of inguinal canal anatomy improved, leading to various surgical techniques. In the late 19th century, Edoardo Bassini introduced a successful reconstruction technique for inguinal hernias [1]. In the latter half of the 20th century, Irving Lichtenstein's stress-free repair significantly reduced recurrence rates, becoming the preferred method [1]. However, in the early 1990s, Ralf Ger introduced laparoscopic techniques, sparking a debate over the best approach [2]. Lichtenstein's

"Tension-Free Hernioplasty" promoted the regular mesh use in hernia repair, shifting away from tissue repair. Laparoscopic tension-free repair gained popularity for promising less pain and faster recovery but had some overlooked limitations [3].

Several studies support laparoscopic hernioplasty over open hernioplasty due to less post-operative pain, fewer complications, quicker return to activity, and improved cosmetic results [4-6]. However, there are disadvantages to laparoscopic repair, including a lengthier recovery period, a more difficult learning curve, more expenses, a larger risk of potentially fatal mishaps, and a higher chance of early recurrence. Transabdominal preperitoneal repair

(TAPP) and completely extraperitoneal repair (TEP) are two types of laparoscopic hernioplasty procedures [6]. TEP lowers intraoperative risks by avoiding the peritoneal cavity, just like open hernioplasty does. This study compares laparoscopic (TAPP mesh repair) with open hernia repair in terms of duration of operation, complications, discomfort following surgery, recurrence, time spent in hospital stay, and return to regular activities.

Methodology

Study Design: In the general surgery department at Jawaharlal Nehru Medical College & Hospital, Bhagalpur, Bihar, India, a comparative study was carried out from August 2022 to August 2023.

Participants: 120 individuals with bilateral and unilateral inguinal hernias had surgery.

Ethical Considerations: Informed consent was taken from all the participants.

Inclusion criteria: Individuals suffering from either one or both main inguinal hernias.

Exclusion Criteria: Individuals with complex hernias (irreducible, obstructed, strangulated) and large size sacs are excluded. Individuals suffering from disorders related to the heart, kidneys, liver or chronic cough.

Methodology: Using a computer random sequence generator, the sixty participants were divided into 2 groups and randomly assigned to either open hernioplasty or laparoscopic surgery. The treating surgeon documented the following information on the research proforma: demographics, medical history, concurrent medications, physical

examination, and pertinent investigations such complete blood count and abdominal and pelvic ultrasonography during the baseline visit. While individuals in group B underwent open hernia mesh surgery, those in group A underwent laparoscopic hernioplasty. Lichtenstein performed a stress-free repair for an open hernioplasty while under spinal anesthesia. The laparoscopic repair was performed using the TAPP mesh repair technique under general anesthesia. Among the metrics assessed were the duration of the operation, complications during and after the procedure, discomfort afterward, duration of hospital stay, the duration of recovery & recurrence.

Statistical Analysis: The mean±SD was used to represent the data. The post-operative pain was measured using a visual analog pain scale. The t-test was used to compare the means of the two groups; a p-value of less than 0.05 was deemed statistically significant.

Result

Out of the 120 individuals in the study, 100 were men (84.71%) and 20 were women (13.29%). Patients undergoing open mesh repair had an average age of 52.06 years, whereas patients undergoing laparoscopic surgery had an average age of 49.45 years. 95 of the 120 patients had unilateral hernias, while 25 of the patients had bilateral inguinal hernias. Fifteen got open mesh surgery and ten had laparoscopic treatment for their bilateral hernias. 39 patients had laparoscopic hernioplasty for unilateral hernias, while 56 had open mesh repair (Table 1).

Table 1: Type of hernia

	Unilateral inguinal hernia	Bilateral inguinal hernia	Total
Laparoscopic hernioplasty	39	10	49
Open Hernioplasty	56	15	71
	95	25	120

For a unilateral open hernioplasty, the average operating time was 46.55 min., whereas for a bilateral procedure, it was 87.26 minutes. The average duration for unilateral laparoscopic hernioplasty was 63.48 minutes, whereas the average duration for bilateral laparoscopic repair was 120.45 minutes.

There were no documented incidences of intra-operative complications in either the open or laparoscopic hernioplasty groups, including damage to the intestines, arteries, or spermatic cord. On the other hand, in the open hernioplasty group, 16.9% (12/71) experienced seroma formation and 14.08% (10/71) experienced wound infection. Of the 49 patients undergoing laparoscopic hernioplasty, 4.08% (2/49) developed wound infections, while

12.24% (6/49) developed seromas. 20.43% of the open hernioplasty group and 6.14% of the laparoscopic hernioplasty group had urinary retention.

After three months of observation, neither mesh rejection nor hernia recurrence was noted in either group. Furthermore, the group that had laparoscopy did not exhibit any port site hernia. The mean pain scores that were recorded on post-operative days (POD) 0, 3, and 7. Laparoscopic hernioplasty (LH) and open hernioplasty (OH) had mean pain scores of 5.1 and 6.6 on POD 0; 4.2 and 5.1 on POD 3; and 1.7 and 3.0 for LH and OH, respectively, on POD 7.

Laparoscopic hernioplasty required an average hospital stay of 4.1 days, but open hernioplasty

required an average hospital stay of 6.7 days. After open hernioplasty, the average recovery period was 8.6 days, and after a laparoscopic hernioplasty, it was 4.8 days.

Discussion

Because laparoscopic surgery eliminates the risks involved with open surgery, it has completely changed the way doctors treat patients. In this study, the results of patients who had either Lichtenstein's open mesh repair or laparoscopic hernioplasty (TAPP) for inguinal hernias, both unilateral and bilateral, were compared. In line with earlier studies [6, 7], both groups' patient mean ages were comparable. Out of the 120 patients, the study covered both unilateral and bilateral cases, in contrast to earlier studies that exclusively examined unilateral hernias [7, 8]. Of them, 15 got open mesh surgery and 10 patients with bilateral hernias underwent laparoscopic treatment. 39 individuals had laparoscopic hernioplasty and 56 had open mesh surgery for their unilateral hernias.

For unilateral open hernioplasty, the average operating duration was 46.55 minutes, while for bilateral hernioplasty, it was 87.26 minutes. On the other hand, the bilateral laparoscopic repair took an average of 120.45 minutes, and unilateral laparoscopic hernioplasty took an average of 63.48 minutes. This is in line with research by Rathod *et al.* and Hamza *et al.*, who discovered that compared to Lichtenstein's open mesh repair, laparoscopic mesh repair required more time [7, 8].

Consistent with findings published by Sudarshan *et al.* [6] and Hamza *et al.* [7], neither group experienced any intraoperative problems, such as damage to the spermatic cord, vasculature, or viscera. On the other hand, a greater incidence of intra-operative problems in laparoscopic operations was discovered by Neumayer *et al.* [9]. Additionally, a meta-analysis by McCormack *et al.* found that laparoscopic procedures were related with a higher risk of surgical complications, particularly bladder and vascular injuries [10]. A number of previous research found that laparoscopic procedures had more problems [11, 12].

Of the 71 patients in the open hernioplasty group, 14.08% experienced post-operative problems, such as wound infection, and 16.9% developed seroma development. Of the 49 patients undergoing laparoscopic hernioplasty, 4.08% developed wound infections, while 12.24% developed seromas. Out of 71 patients, 20.43% of the open hernioplasty group and 6.14% of the laparoscopic hernioplasty group had urinary retention. These outcomes are in line with research on seroma development and urine retention conducted by Sudarshan *et al.* [6]. When comparing the two groups' mean pain scores, POD 0 showed that the differences were not statistically

significant. On the other hand, the pain scores on postoperative days 3 and 7 for laparoscopic hernia repair were statistically significant and showed significantly less pain. Similar findings were observed in a study by Sudarshan *et al.* [6].

The mean length of hospital stays for laparoscopic surgery and open hernioplasty was found to differ statistically significantly, with a 4-day stay and a 7-day stay, respectively. Similar outcomes, with the laparoscopic group remaining for 4.56 days and the open group for 5.76 days, were also reported by Rathod *et al.* [8]. It took an average of 4.8 days following laparoscopic hernioplasty and 8.6 days following open hernioplasty in the study to resume regular activities, a difference that was statistically significant. These outcomes align with the research conducted by Rathod *et al.* [8]. Because it contrasts Lichtenstein's open mesh repair- which addresses both unilateral and bilateral hernias- with TAPP mesh repair, this study is especially valuable.

Limitations and Recommendations

The limitations include the exclusion of complex hernias and the absence of long-term follow-up data. The utilization of laparoscopic inguinal hernia repair is favored as it has been associated with reduced postoperative morbidity. The investigation of the long-term outcomes and cost-effectiveness of laparoscopic hernia repair in comparison to open hernia repair is crucial in order to provide valuable insights for clinical decision-making regarding treatment options.

Conclusion

Laparoscopic hernia repair is deemed to be a safe procedure, exhibiting reduced postoperative morbidity when performed by experienced surgeons. Compared to open repair, this method has a number of benefits, such as a quicker return to regular activities and employment, as well as improved subjective and objective cosmetic outcomes. However, it is important to note that laparoscopic hernia repair does have certain limitations, such as increased operative time, the potential need for drainage, and a higher recurrence rate as per literature. When managing bilateral and recurring inguinal hernias, laparoscopic surgery is advised.

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