

## Comparison of the Lichtenstein's Open Hernioplasty Versus the Minimally Invasive Laparoscopic Hernioplasty for Inguinal Hernias

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### Abstract:

**Background:** One of the most prevalent medical conditions is inguinal hernia, and more than 20 million groyne hernias are treated annually in the world. Males are more likely to get inguinal hernias than females are, with a lifetime risk of more than 27% versus 5%. Irving Lichtenstein originally exhibited onlay mesh tension free prosthetic repair in 1982, and it has completely changed how hernias are repaired. Similar to this, Ralph Ger performed the first laparoscopic hernioplasty in 1982, opening up a vast array of opportunities.

**Methods:** Two equal groups of 25 each were created from 50 patients. In a prospective fashion, the first group received laparoscopic inguinal hernia meshplasty, while the second group received open tension free meshplasty. After excluding hernia issues and restricting co-morbidities, both groups were assessed for the length of the surgery, post-operative pain and painkiller use, average length of hospital stay, post-operative complications, return to normal activities and return to work, as well as full productivity.

**Results:** The average operation time was significantly longer in the laparoscopic group, but there was less post-operative discomfort, a shorter hospital stay, and an earlier return to both regular activities and an active, productive job life. The majority of these factors were statistically significant when compared to open meshplasty. However, there were no appreciable intra- or postoperative problems. These outcomes were comparable to a number of other research and analyses conducted between these two widely used techniques. Less postoperative discomfort and the need for analgesics are benefits of the laparoscopic method. The patients were able to go back to employment and functional status quickly. It has the benefit of allowing you to check the other side for a little hernial sac. The laparoscopic method offers access to the location without disrupting the old scar tissue in cases of recurrent hernia.

**Conclusion:** The minimally invasive hernioplasty is an advanced laparoscopic operation with a steep learning curve and a longer surgery time than open hernioplasty. There is a danger of intraoperative and postoperative complications, including greater recurrence rates, in the hands of inexperienced and training surgeons. Both the initial outlay and ongoing maintenance costs are substantial. Therefore, despite some obvious advantages over open meshplasty, it might take some time for high throughput centres with heavy workloads to adopt this approach routinely. However, it can be used specifically in situations like recurring and bilateral hernias where a laparoscopic technique is more advantageous.

**Keywords:** Lichtenstein's Hernioplasty, Minimally Invasive Laparoscopic Hernioplasty, Inguinal Hernias.

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## Introduction

More than 20 million groyne hernias are fixed annually in the world. Regardless of the symptoms, surgical correction is the standard treatment for groyne hernias due to the risk of intestinal blockage and visceral strangulation in untreated instances. [1]Irving Lichtenstein made the first anterior approach onlay mesh tension free prosthetic repair of the inguinal canal in 1984, revolutionising the way hernia repairs have been performed with very low recurrence rates. The first transabdominal closure of an inguinal hernia defect during a laparoscopy for other purposes was documented by Ralph Ger in 1982. After some time had passed, in 1989, the gynaecologist S. Bogojavalensky displayed a video showing the laparoscopic intra-abdominal incision of the peritoneal hernia sac, followed by the closure of the visible muscle defect with a rolled-up piece of polypropylene mesh. After undertaking a number of tests and research, Ger, Shultz, Corbitt, and others showed laparoscopic hernia repair in 1990. Similar to the open preperitoneal method, laparoscopic hernia repair can be carried done transabdominally or entirely extraperitoneally. As of right now, both minimally invasive laparoscopic meshplasty and anterior open tension free meshplasty are evidence-based, approved procedures with particular benefits and disadvantages for adult hernioplasty. The tension-free mesh repair developed by Lichtenstein has gained recognition as a very effective, straightforward method of treating inguinal hernias. It is affordable, simple to learn and train in, and doesn't require a sophisticated infrastructure. In comparison to earlier tissue repairs, the patients experience less postoperative problems and have extremely low

recurrence rates. Thus, despite the risks associated with using a prosthesis like mesh in-situ, it is still the most often used and highly recognised treatment in the world today.[2-5]

However, compared to open mesh repair, laparoscopic surgery has many benefits, including less postoperative discomfort, a reduced need for analgesics, and a quicker return to normal activities and productivity. It allows access without upsetting the old scar tissue in recurrent hernias and provides the possibility of simultaneously inspecting both sides via the posterior approach. However, the advent of laparoscopic hernia repair has brought about new difficulties. The laparoscopic procedure requires a lot of practise to become proficient. It is necessary to deal with newer issues not seen with open repair, such as visceral damage, small intestinal blockage, port site hernia, and subcutaneous emphysema, as well as changes in anatomical perspective. Hence The acceptance of laparoscopic hernia repair has been delayed.[6-11]

Thus, inguinal hernia repair is a field that constantly changes. In a time when the world is slowly but surely moving towards limited access surgical procedures, this study compares standard open meshplasty with laparoscopic meshplasty in our tertiary care centre.

## Material and Methods

From July 2021 to December 2022, this prospective study was carried out at the upgraded surgery department of the Darbhanga Medical College and Hospital in Laheriasarai, Bihar. Including Data Collection from surgery and Obstetrics & Gynaecology department of DMCH,

Name, age, and sex of the patient, registration number, occupation, comprehensive history of the current disease, prior medical history, occupational history, etc., must all be gathered. Complete physical examination, laboratory and radiological tests as needed, procedure, any post-op analgesia needed, complications, and length of hospital stay follow.

Patients diagnosed with a simple inguinal hernia and deemed suitable for mesh surgery ranged in age from 23 to 75. This study excluded patients with difficult inguinal hernias (irreducible, blocked, or strangulated inguinal hernias), ASA IV, V, or E categories, who had undergone open surgery instead of laparoscopy, who had bleeding diathesis, or who were unwilling to have surgery.

After excluding the complicated hernias, the study included a total of 50 individuals who presented with uncomplicated inguinal hernias. These patients included 25 who underwent surgery using Lichtenstein's Open Mesh Repair technique and another 25 who underwent laparoscopic trans abdominal pre-

peritoneal or totally extra peritoneal surgery.

### Methods of surgical repair of inguinal hernias

- The "Transabdominal Pre-peritoneal method" of hernioplasty" (TAPP) or the "Total Extra Peritoneal" (TEP) method shall be used for all laparoscopic procedures.
- All open procedure by 'Lichtenstein's tension free open mesh repair'.

The following statistical techniques were used to analyse the results of the two types of hernia repairs against the predetermined outcome measures: - Chi-Square, Descriptive Crosstabs, Independent Samples T Test.

### Results

The youngest participant in our study was 23 years old, and the oldest was 75. Participants were all male. The youngest and oldest patients that had Lichtenstein's repair were 26 and 68 years old, respectively. The TEP repair procedure was performed on patients of all ages, the youngest being 23 and the oldest being 75.

**Table 1: Mean Age and Standard Deviation (comparing cases who underwent Lichtenstein's Repair and TEP repair)**

	Lichtenstein's repair	TEP repair
Mean Age ( inyrs)	46.99	52.86
SD	13.0798	13.61765

Since Lichtenstein's repair and TEP repair were both performed on the patients, there is no correlation between their ages and either operation because the P value is more than 0.05.

Twenty individuals overall had left-sided inguinal hernias, compared to thirty who had right-sided hernias.

**Table 2: Type of Hernia**

Valid	No. of Patients	Percentage
Direct inguinal Hernia	27	54%
Indirect Inguinal Hernia	23	46%
Total	50	100%

**Table 3: Association of direct and indirect inguinal hernia patients with Lichtenstein's and TEP repair**

Hernia	Open hernia	TEP	Total
Direct	11	16	27
Indirect	14	9	23
Total	25	25	50

Since the P value is more than 0.05, it is not significant. A particular type of hernia is not statistically significantly biased in favour of a certain procedure.

**Table 4: Duration of symptoms**

Valid	No. of patients	Percentage
< 1 yr	22	44%
>1 yr	28	56%
Total	50	100%

A higher number of patients presented with complaints formore than 1 year.

**Table 5: Association between smoking and incidence of hernia**

	Direct hernia	Indirect hernia	Total
Smoker	19	9	28
Non-smoker	8	14	22
Total	27	23	50

P value is significant at 0.03 (<0.05). This suggests that direct inguinal hernias were more common in smokers in this study.

**Table 6: Precipitating factors**

Valid	No. of cases	Percentage
Strenuous work only	23	46%
Bronchial asthma only	2	4%
BPH only	3	6%
Constipation only	2	4%
COPD only	1	2%
Smoker only	11	22%
More than one factor	8	16%
Total	50	100%

Strenuous employment accounted for 46% of the cases, making it the most significant triggering factor.

**Table 7: Duration of surgery in minutes**

Type of Surgery	No. of patients	Mean(min)	SD
Lichtenstein's	25	62.2	13.9254
TEP	25	72.4	10.3199
Total	50		

Significant since the P value is 0.005. As a result, compared to Lichtenstein's repair, unilateral TEP repair takes longer to complete. The learning curve might be to accountable for this.

**Table 8: Duration of post-operative pain in days**

Surgery	No. of patients	Mean days	SD
Lichtenstein's	25	2.8	1.4434
TEP	25	1.48	0.6532
Total	50		

Significant, with a P value of <0.001. In comparison to a Lichtenstein's repair, there is a distinct decrease in the number of days that postoperative pain lasts (in days).

**Table 9: Duration of post-operative hospital stay ( in days )**

Surgery	No. of patients	Mean days	SD
Lichtenstein's	25	5.12	2.242
TEP	25	2.6	0.866
TOTAL	50		

Significant, with a P value of  $<0.001$ . Therefore, patients who received Lichtenstein's repair stayed in the hospital longer than individuals who underwent TEP repair.

**Table 10: Cost in Rupees**

Surgery	No. of patients	Mean cost in Rupees	SD
Lichtenstein's	25	3500	640.31
TEP	25	8068	1074.99
Total	50		

Significant, with a P value of  $<0.001$ . This suggests that TEP repair costs are higher than those for Lichtenstein's repair, on the whole.

**Table 11: Complications**

Complications			
Surgery	Hematoma	Seroma	Total
Lichtenstein's	-	-	-
TEP	-	2	2
TOTAL	-	2	

There were only two cases of seromas, in case of TEP repair.

**Table 12: Time interval of returning to normal work (in days)**

Type of surgery	No. of patients	Mean time interval (in days) of returning to work	SD
Lichtenstein's repair	25	43.72	13.8
TEP	25	25.6	12.1
Total	50		

P value is  $< 0.05$ , making it significant. As a result, patients who had TEP repair were able to return to work sooner than those who had Lichtenstein's repair.

### Discussion

Since Eduardo Bassini of Padua University first published his method of repair in the paper "Radical Cure of Inguinal Hernias" back in 1887, the topic of inguinal hernia repair has been highly contentious.

The fact that over a hundred inguinal hernia repairs have been documented and performed at some point throughout the past century is evidence that none have been seen as clearly superior to the others. However, using mesh to treat an inguinal

hernia has become standard practise in recent years.

Tension-free mesh repairs have become popular and are used extensively because they reduce the recurrence rate from more than 15% with tissue repairs to less than 1%, as well as postoperative pain and recovery time. Laparoscopic inguinal hernia repair is a relatively new technique in the surgeon's toolbox, having only been used for around 20 years. Laparoscopic repair of inguinal hernias has earned its deserved place in surgical therapy, while possibly not being used as frequently as laparoscopic cholecystectomy for gallstone disease[12]. We have only performed TEP repairs in our patients out of the two most popular laparoscopic hernia repair

procedures, TAPP and TEP. In TAPP, the surgeon makes an incision in the peritoneum and inserts a mesh across potential hernia locations. The peritoneal cavity is not accessed during TEP, and mesh is utilised to seal the hernia from outside the peritoneum, a thin membrane that covers the organs in the belly.[13]

### Conclusion

The success and drawbacks of the Total Extraperitoneal (TEP) Repair and Lichtenstein's tension-free repair are compared in the current study. From the moment of admission until release, each patient was closely observed, and the parameters relevant to the study were recorded.

In contrast to hernioplasty, we discovered that laparoscopic hernia repair significantly lessens post-operative pain. In TEP repair, there is a shorter recovery period. When compared to Lichtenstein's repair, TEP's post-operative return to work is quicker. Laparoscopic hernia repair is also more expensive than hernioplasty. The patients were observed in order to note any long-term effects and to determine how long it took them to resume their pre-hernia lifestyle.

A few participants dropped out and did not continue. The Wong Baker scale, which was used to evaluate pain, was vulnerable to bias and did not take into consideration people's varying pain thresholds. It was impossible to follow up with every patient over the long run.

No two surgeons would disagree that groyne hernias cannot be repaired universally. The younger surgeon will undoubtedly be perplexed by the wide variety of surgical procedures available for treating groyne hernias. Every technique will have supporters and detractors. Here, the use of evidence-based medicine is essential, and the long-term effects of innovative operations should be closely monitored. Even though TEP repair is more expensive, it offers benefits like less

post-operative pain, a shorter hospital stay, and an earlier return to regular activities.

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