

Original Research Article

A COMPARISON STUDY BETWEEN OPEN TRANSINGUINAL PREPERITONEAL HERNIA REPAIR AND LICHTENSTEIN'S HERNIA REPAIR

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Received : 16/05/2026
Received in revised form : 26/06/2026
Accepted : 08/07/2026

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DOI:10.70034/ijmedph.2026.3.104

Source of Support: Nil,

Conflict of Interest: None declared

Int J Med Pub Health

2026; 16 (3); 633-637

ABSTRACT

Background: Lichtenstein tension-free mesh repair remains the standard surgical procedure for inguinal hernia repair because of its simplicity and low recurrence rates. However, chronic postoperative pain, sensory disturbances, and recurrence remain important concerns. Open transinguinal preperitoneal (TIPP) mesh repair has emerged as an alternative technique that places the mesh in the preperitoneal space, potentially reducing postoperative pain and nerve-related complications. This study compared the surgical outcomes of TIPP and Lichtenstein hernia repair. The objective is to compare the effectiveness and safety of Open Transinguinal Preperitoneal (TIPP) mesh repair with Lichtenstein tension-free mesh repair in patients undergoing elective inguinal hernia surgery.

Materials and Methods: A prospective comparative study was conducted in the Department of General Surgery, Coimbatore Medical College Hospital, Tamil Nadu, India, between November 2023 and November 2024. Fifty patients aged 20–80 years with uncomplicated inguinal hernia were randomly allocated into two equal groups. Group A (n=25) underwent Lichtenstein hernioplasty, while Group B (n=25) underwent TIPP repair using polypropylene mesh. Patients with complicated hernias, pregnancy, significant comorbidities, or unwillingness to participate were excluded. Operative duration, intraoperative complications, early postoperative complications, and late postoperative outcomes were compared. Statistical analysis was performed using the Chi-square test, with $p < 0.05$ considered statistically significant.

Results: Among the 50 patients, 49 (98%) were males and one (2%) was female. The majority (56%) were between 41 and 60 years of age. Indirect inguinal hernia was more common (58%) than direct hernia (42%). Operative time was significantly shorter in the Lichtenstein group, with 80% of procedures completed within 45 minutes compared with 40% in the TIPP group ($\chi^2=8.33$, $p=0.003$). Intraoperative complications were comparable between groups without statistical significance. Early postoperative complications, including severe pain, cord edema, seroma, scrotal collection, and surgical site infection, occurred more frequently following Lichtenstein repair. Late postoperative complications such as chronic pain (8%) and loss of sensation (12%) were observed only in the Lichtenstein group, whereas none were reported following TIPP repair.

Conclusion: Both Lichtenstein and TIPP repairs are safe and effective techniques for elective inguinal hernia repair. Lichtenstein repair offers the advantage of shorter operative duration, whereas TIPP repair demonstrates fewer postoperative complications, particularly chronic pain and sensory disturbances. TIPP represents a promising alternative technique, although additional studies with larger sample sizes and longer follow-up are necessary to evaluate recurrence rates and long-term outcomes.

Keywords: Inguinal hernia, Lichtenstein hernioplasty, Transinguinal preperitoneal repair, TIPP, Mesh hernioplasty, Chronic postoperative pain, Hernia surgery.

INTRODUCTION

Inguinal herniorrhaphy is among the most commonly performed surgical procedures, with 10-20% of surgeries addressing recurrence. Since the Bassini method was introduced in 1887, more than 70 distinct techniques for tissue repair have been documented.^[1] Bassini's initial description of herniorrhaphy emphasized the importance of bed rest and immobilization for wound healing. However, this approach was later linked to the serious risk of pulmonary embolism, leading to recommendations for early ambulation. The ideal method for inguinal hernia repair in patients is still debated. Newer tension-free techniques have demonstrated advantages over traditional tension-inducing methods. The shift towards tension-free hernioplasty using mesh was motivated by high recurrence rates, prolonged postoperative discomfort, and extended recovery times associated with tissue repairs, along with a better understanding of the metabolic causes of inguinal hernias. The Lichtenstein tension-free hernioplasty, developed in 1984, has become the gold standard for hernia repair, recognized by the American College of Surgeons, and is effectively utilized even for recurrent cases, boasting low recurrence rates.^[1,2]

However, repairing a recurrent inguinal hernia after a Lichtenstein procedure can be particularly challenging due to dense scar tissue around the mesh, which increases the risk of testicular injury and local hematomas. The preperitoneal approach, whether performed openly or laparoscopically, can alleviate these complications. Laparoscopic preperitoneal hernia repair is considered an excellent option for inguinal hernia repair, especially when executed by skilled surgeons, as it typically results in shorter hospital stays, reduced postoperative pain, and lower recurrence rates.^[3] Nonetheless, its high costs and steep learning curve are notable limitations. The open posterior preperitoneal mesh repair, popularized by Nhyus, remains a strong alternative for recurrent inguinal hernias, primarily due to its advantages in mesh placement and avoidance of scar tissue complications.^[4]

This article aims to evaluate the outcomes of open posterior preperitoneal repair for recurrent inguinal

hernias following Lichtenstein tension-free hernioplasty. The study will specifically compare the efficacy of Open Trans Inguinal Preperitoneal Hernia Repair using prolene mesh with Lichtenstein's tension-free hernia repair. Even though Lichtenstein repair has been practised there was a high recurrence rate due to the tension while repairing and also the preperitoneal mesh repair helped patients by reducing the postoperative pain.

MATERIALS AND METHODS

This is a prospective study with study population of 50 patients who are having inguinal hernia over a period of one year from APRIL 2023 TO APRIL 2024. In this study, the clinical material consists of patients admitted with inguinal hernia in the department of general surgery of COIMBATORE Medical College and Hospital, Coimbatore.

Inclusion Criteria

- Inguinal hernia patients admitted in Coimbatore medical college aged between 20-80years.
- Patients willing to participate in the study

Exclusion Criteria

- Patient not willing to participate in study
- Patients with co morbidities
- Pregnant
- Age below 20 yrs/ above 80 years
- Complicated hernias

At Coimbatore Medical College Hospital, around 25 transinguinal preperitoneal mesh repair surgeries were carried out between 2023 and 2024. Regardless of the kind of inguinal hernia, patient age, or extent of the defect, patients were chosen at random. A transparent, non-absorbable synthetic monofilament polypropylene surgical mesh was utilized for the repair.

Patients were closely watched for wound infection, seroma, discomfort, scrotal collection, and cord edema following surgery. After being released, they were strongly advised to attend routine follow-up appointments so that their discomfort, surgical site infection, and risk of hernia recurrence could be closely monitored.

Statistical analysis:

In this study, chi-square test is used to compare and analyse between two groups.

RESULTS

Table 1: Distribution of Patients into Groups

	Group A	Group B	
Lichtenstain repair	25	0	25
TIPP	0	25	25
	25	25	50

In this study patients were divided into 2 groups, group A contains 25 patients who underwent lichtenstain hernia repair, group B contains 25

patients who underwent transinguinal preperitoneal repair(TIPP).

Table 2: Gender distribution

	Group A	Group B
Male	24	25
Female	1	0
	25	25

In this study out of 50 patients 49 were males, 1 were female indicates male predominant disease. Group A had 24 males and 1 female, group B had all 25 males.

Table 3: Age Distribution

	Group A	Group B
<30years	2	1
31-40years	4	4
41-50years	7	8
51-60years	6	7
>60years	6	5
	25	25

In this study out of 50, 11 were <40years, 28 were between 41-60years most common age of presentation, 11 were >60years.

Table 4: Symptoms Distribution

	No. of patients	Percentage
Inguinal swelling	50	100%
Lower abdominal pain	23	46%

In this study out of 50, all patients present with swelling in groin region most common symptom of presentation, 23 patients had associated pain.

Table 5: Duration of symptoms

	No. of patients	Percentage
<3months	13	26%
3-6months	26	52%
>6months	11	22%

Graph 5 : Duration of symptoms

In this study out of 50, 13 patients present with <3months duration of symptoms, 26 patients present

between 3-6months, 11 were presents >6months of duration of symptoms.

Table 6: Type of inguinal hernia

	Group A	Group B	Total
Indirect	14	15	29
Direct	11	10	21
	25	25	50

In this study out of 50, 29 were indirect inguinal hernia, 21 were direct inguinal hernia, in group A, 14 were indirect and 11 were direct. In group B, 15

were indirect and 10 were direct hernia. Indicating indirect hernia was the most common type in this study.

Table 7: Co-Morbid Illness

Co-morbid illness	No. of patients
DM	12
Hypertension	10
COPD	4
CAD	3

In this study out of 50 patients, 12 were had DM, 10 were had hypertension, 4 were had COPD, 3 were had CAD.

Table 8: Duration of surgery

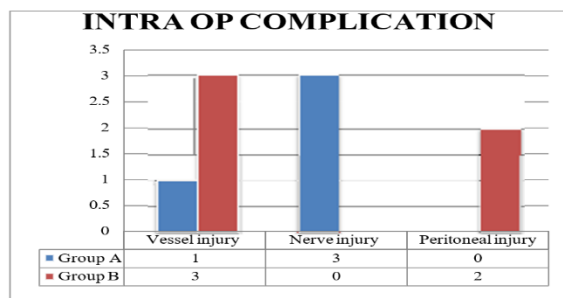
	Group A	Group B	
<45min	20	10	Chi-squ: 8.33 p-value: 0.003(<0.05)
45min-1hours	5	13	
>1hours	0	2	

In this study, lichtenstain hernia repair, out of 25 patients 20 patients duration of surgery were <45min, 5 patients were between 45min-1hour. But in TransInguinal PreParitoneal (TIPP) only 10 were

finished <45mins, 25 were >45mins with p-value: 0.003(<0.05) statistically significant. Indicates Lichtenstain repair is finished faster than TIPP.

Table 9: Intra Op Complication

	Group A	Group B	
Vessel injury	1	3	p-value: 0.29(>0.05)
Nerve injury	3	0	p-value: 0.07(>0.05)
Peritoneal injury	0	2	p-value: 0.14(>0.05)

**Figure 1: Intra op complication**

In this study, in group A during intra op 3 had nerve injury, 1 had vascular injury, in group B 3 had vascular injury, 2 had peritoneal injury all were p-value (>0.05) statistically not significant.

In this study early post op complication, in group A, 4 experienced severe pain, 3 had cord edema, 1 had scrotal collection, 3 had seroma, 2 developed SSI. In group B, 2 experienced severe pain, 1 had SSI, no one had cord edema, scrotal collection, seroma.

Table 10: Early post op complication

	Group A	Group B	
Severe Pain	4	2	p-value: 0.38(>0.05)
Cord edema	3	0	p-value: 0.07(>0.05)
Scrotal collection	1	0	p-value: 0.31(>0.05)
SSI	2	1	p-value: 0.55(>0.05)
Seroma	3	0	p-value: 0.07(>0.05)

Table 11: Late Post Op Complication

	Group A	Group B	
Chronic pain	2	0	p-value: 0.14(>0.05)
Loss of sensation	3	0	p-value: 0.07(>0.05)

In this study late post op complication, in group A 2 had chronic pain, 3 had loss of sensation, in group B no such complication.

DISCUSSION

In this study out of 50 patients 49 were males, 1 were female indicates male predominant disease. Out of 50, 11 were <40 years, 28 were between 41-60 years most common age of presentation, 11 were >60 years. Out of 50, all patients present with swelling in groin region most common symptom of presentation, 23 patients had associated pain. These findings are same with results of few studies.^[5-7]

Out of 50, 13 patients present with <3 months duration of symptoms, 26 patients present between 3-6 months, 11 were presents >6 months of duration of symptoms. Out of 50, 29 were indirect inguinal hernia, 21 were direct inguinal hernia, Lichtenstein hernia repair, out of 25 patients 20 patients duration of surgery were <45 min, 5 patients were between 45 min-1 hour. But in Trans Inguinal Pre Paritoneal (TIPP) only 10 were finished <45 mins, 25 were >45 mins with p-value: 0.003(<0.05) statistically significant. Lichtenstein repair is finished faster than TIPP. Findings similar with international studies.^[8-10]

In Lichtenstein hernia repair during intra op 3 had nerve injury, 1 had vascular injury, in TransInguinal PreParitoneal (TIPP) 3 had vascular injury, 2 had peritoneal injury all were p-value(>0.05) statistically not significant. Early post op complication, in

Lichtenstein hernia repair, 4 experienced severe pain, 3 had cord edema, 1 had scrotal collection, 3 had seroma, 2 developed SSI. In TransInguinal PreParitoneal (TIPP), 2 experienced severe pain, 1 had SSI, no one had cord edema, scrotal collection, seroma. Late post op complication, in Lichtenstein hernia repair 2 had chronic pain, 3 had loss of sensation, in TransInguinal PreParitoneal(TIPP) no such complication. Results similar to few studies.^[11,12]

Summary

A study comparing open transinguinal preperitoneal hernia repair and Lichtenstein's hernia repair was conducted in the Department of General Surgery at Coimbatore Medical College over the span of one year.

Data were collected using a predefined proforma and carefully analyzed to assess the duration of surgery, as well as intraoperative, early postoperative, and late postoperative complications. The study involved 50 patients divided into two groups for comparison. The first group included 25 patients who underwent Lichtenstein tension-free mesh repair, while the second group comprised 25 patients who had transinguinal preperitoneal hernia repair. Cases were selected randomly.

All 50 patients completed the study protocol, with the most common presenting symptom being groin swelling, noted in all patients. Additionally, 23 patients reported accompanying pain. The majority of the study population was male, with 49 males and 1 female.

Out of the 50 patients, 29 were diagnosed with indirect inguinal hernia and 21 with direct inguinal hernia. In the Lichtenstein repair group, 20 out of 25 patients had surgery lasting less than 45 minutes, while 5 patients took between 45 minutes to 1 hour. In contrast, within the TIPP group, only 10 patients had surgeries under 45 minutes, with 25 patients taking longer than 45 minutes. This indicates that Lichtenstein procedures were generally completed more quickly than TIPP procedures.

Regarding early postoperative complications, the Lichtenstein group experienced severe pain in 4 patients, cord edema in 3, scrotal collection in 1, seroma in 3, and surgical site infection (SSI) in 2 patients. Conversely, the TIPP group reported severe pain in 2 patients, SSI in 1, but had no cases of cord edema, scrotal collection, or seroma.

In terms of late postoperative complications, the Lichtenstein repair group had 2 cases of chronic pain and 3 instances of loss of sensation, while the TIPP group did not report any such complications.

CONCLUSION

There was no discernible results in performance between the TIPP procedure and the Lichtenstein technique according to this study design. In both groups, the study's reported incidence of chronic pain was minimal.

But the Lichtenstein method requires less time in the operating room. Lichtenstein is widely practiced worldwide, and TIPP requires little prior training to execute.

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