e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(6); 652-656

Original Research Article

Comparative Study between Lichtenstein Repair and Trans Abdominal Pre Peritoneal Repair for Inguinal Hernia

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Received: 01-03-2026 / Revised: 15-04-2026 / Accepted: 21-05-2026

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Conflict of interest: Nil

Abstract

Background: Inguinal hernia is one of the most common surgical conditions, and both open Lichtenstein repair and laparoscopic Transabdominal Preperitoneal (TAPP) repair are widely used techniques. The choice of the optimal procedure remains debated due to differences in operative time, postoperative pain, recovery, complications, and cost.

Aim: To compare the clinical outcomes of Lichtenstein repair and laparoscopic TAPP repair in patients with inguinal hernia.

Materials and Methods: This prospective cohort study was conducted in the Department of General Surgery at People's College of Medical Sciences & Research Centre and associated People's Hospital from April 2024 to December 2025. A total of 75 patients with uncomplicated unilateral or bilateral inguinal hernia were included. Sixty patients underwent open Lichtenstein tension-free mesh repair, while fifteen patients underwent laparoscopic TAPP repair. Operative time, postoperative pain using Visual Analogue Scale, hospital stay, return to work, postoperative complications, and early recurrence were assessed. Data were analyzed using appropriate statistical tests, with $p<0.05$ considered significant.

Results: The mean operative time was significantly longer in the TAPP group compared with the Lichtenstein group. However, TAPP repair was associated with significantly lower postoperative pain scores, shorter hospital stay, and earlier return to work. Wound hematoma, wound infection, groin pain, and early recurrence were comparatively higher in the Lichtenstein group.

Conclusion: Both Lichtenstein and TAPP repairs are safe and effective for inguinal hernia management. TAPP repair offers better postoperative comfort, faster recovery, shorter hospitalization, and improved cosmetic outcomes, while Lichtenstein repair remains a simpler, cost-effective, and reliable option, especially in resource-limited settings.

Keywords: Inguinal hernia, Lichtenstein repair, TAPP repair, laparoscopic hernia repair, postoperative pain, hospital stay, recurrence.

DOI: 10.25258/ijcpr.18.6.109

Introduction

An inguinal hernia is defined as the protrusion of abdominal contents, such as bowel or omentum, through a weak area in the inguinal canal. It is one of the most common surgical conditions encountered worldwide and represents a major part of general surgical practice. Hernia repair is among the most frequently performed operations globally, with millions of procedures carried out annually. Despite continuous advancements in surgical techniques, the ideal method of repair remains a topic of ongoing debate. [1]

Inguinal hernias are more common in males and may be classified as direct or indirect depending on their anatomical location. Several risk factors contribute to the development of inguinal hernia, including advanced age, male gender, smoking, chronic cough, constipation, obesity, and occupations involving heavy physical activity that increase intra-abdominal pressure. If left untreated, inguinal hernias may result in complications such

as incarceration, obstruction, and strangulation. [2,3]

Patients commonly present with groin swelling associated with pain, heaviness, or discomfort, which often interferes with daily activities and quality of life. Surgical repair remains the definitive treatment for symptomatic inguinal hernia. Over time, tension-free mesh repairs have become the standard approach due to lower recurrence rates and improved outcomes. [4]

Among open techniques, the Lichtenstein tension-free mesh repair is widely accepted as the gold standard because of its simplicity, effectiveness, and low recurrence rate. However, postoperative pain and delayed recovery remain important concerns. [5] With the advancement of minimally invasive surgery, laparoscopic Transabdominal Preperitoneal (TAPP) repair has gained popularity. TAPP repair provides advantages such as reduced postoperative pain, shorter hospital stay, faster return to normal activities, improved cosmetic results, and the ability to detect occult contralateral hernias. [6,7]

Although both techniques are widely practiced, controversy persists regarding the superior approach. Therefore, the present study was undertaken to compare Lichtenstein repair and TAPP repair in terms of operative time, postoperative complications, hospital stay, recovery, and overall clinical outcomes in patients with inguinal hernia.

Material & Methodology

This prospective cohort study was conducted in the Department of General Surgery at People's College of Medical Sciences & Research Centre and its associated People's Hospital. The study included patients presenting with inguinal hernia between April 2024 and December 2025. A total of 75 eligible patients diagnosed with unilateral or bilateral uncomplicated inguinal hernia were enrolled after obtaining written informed consent. Patients aged 18–60 years of either sex with direct and/or indirect inguinal hernia were included in the study, while patients with obstructed or incarcerated hernia, previous laparoscopic hernia repair, bleeding disorders, cardiopulmonary compromise, untreated bladder outlet obstruction, or those unwilling to participate were excluded.

The patients were allocated into two study groups according to the surgical procedure selected. Group A comprised 60 patients who underwent open tension-free mesh repair using the Lichtenstein technique, while Group B included 15 patients who underwent laparoscopic Transabdominal Preperitoneal (TAPP) repair. A detailed clinical history, physical examination, laboratory investigations, and relevant radiological findings were recorded preoperatively using a structured proforma. Intraoperative findings including duration of surgery and injury to adjacent organs or viscera were documented during the procedure.

Postoperatively, all patients were monitored throughout their hospital stay for complications such as wound hematoma, seroma, wound infection, groin pain, and early recurrence. Pain assessment was performed using the Visual Analogue Scale (VAS).

Duration of hospital stay and return to work were also recorded. Data were entered into MS Excel and analyzed using SPSS trial version 25.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were presented as frequency and percentage. Student's independent t-test, Chi-square test, and Fisher's exact test were applied as appropriate. A p-value of <0.05 was considered statistically significant.

Result

A total of 75 patients with inguinal hernia were included in the study, of whom 60 underwent Lichtenstein repair and 15 underwent TAPP repair. The mean age of patients in the Lichtenstein and TAPP groups was 46.8 ± 11.2 years and 44.5 ± 10.6 years respectively, with male predominance observed in both groups. There was no statistically significant difference between the groups regarding demographic variables and associated comorbidities.

The mean operative time was significantly longer in the TAPP group compared to the Lichtenstein group (78.2 ± 11.6 vs 52.6 ± 9.4 minutes; $p<0.001$). However, patients undergoing TAPP repair experienced significantly lower postoperative pain scores, shorter hospital stay, and earlier return to work compared to the open repair group ($p<0.001$). Postoperative complications such as wound hematoma, seroma, wound infection, groin pain, and early recurrence were comparatively higher in the Lichtenstein group, although most differences were not statistically significant. Overall, TAPP repair demonstrated better postoperative recovery and patient comfort despite requiring longer operative duration.

Table 1: Demographic Characteristics of Study Participants

Variable	Lichtenstein Group (n=60)	TAPP Group (n=15)	p- Value
Mean age (Years)	46.8 ± 11.2	44.5 ± 10.6	0.421
Male : Female ratio	56; 4	14:1	0.887
Mean weight (kg)	67.4 ± 8.3	69.1 ± 7.8	0.498
Bilateral Hernia	8 (13.3%)	4 (26.7%)	0.176

Comorbidies Present	18 (30.0%)	5 (33.3%)	0.801

Table 2: Operative and postoperative Outcome

Variable	Lichtenstein Group (n=60)	TAPP Group (n=15)	p- Value
Mean operative Time (min)	52.6 ± 9.4	78.2 ± 11.6	<0.001
Mean VAS Score	5.8 ± 1.1	3.4 ± 0.90	<0.001
Mean hospital stay (Days)	3.8 ± 1.2	2.1 ± 0.80	<0.001
Return to work (Days)	13.5 ± 3.2	8.6 ± 2.4	<0.001

Table 3: Post-Operative Complications

Complications	Lichtenstein Group (n=60)	TAPP Group (n=15)	p- Value
Wound Hematoma	5 (8.3%)	1 (6.7%)	0.832
Wound Seroma	4 (6.7%)	1 (6.7%)	1.000
Wound Infection	6 (10.0%)	1 (6.7%)	0.198
Groin Pain	9 (15%)	1 (6.7 %)	0.392
Early Recurrance	2(3.3 %)	0 (0%)	0.463

Discussion: Inguinal hernia repair remains one of the most frequently performed surgical procedures worldwide, and the evolution from tissue-based repair to tension-free mesh hernioplasty has significantly reduced recurrence and postoperative morbidity [8,9]. Among the currently practiced techniques, open Lichtenstein repair has long been considered the gold standard; however, minimally invasive laparoscopic techniques such as Transabdominal Preperitoneal (TAPP) repair have gained increasing popularity because of improved postoperative recovery and cosmetic outcomes [10,11]. The present prospective study was conducted to compare the clinical outcomes of Lichtenstein repair and TAPP repair in patients with inguinal hernia.

In the present study, the mean age of patients in the Lichtenstein and TAPP groups was comparable, with the majority of patients belonging to the middle-aged adult population. A marked male predominance was observed in both groups, which is consistent with the known epidemiological pattern of inguinal hernia due to anatomical weakness of the male inguinal canal and persistence of the processus vaginalis [12,13]. Similar demographic findings were reported by Loganathan P et al. and Sultan AAEA et al., who also demonstrated overwhelming male predominance among patients undergoing inguinal hernia repair [14,15].

Right-sided indirect inguinal hernia was the most common presentation in our study, consistent with the delayed descent of the right testis and persistence of processus vaginalis [16].

Bilateral hernias were more commonly managed with the TAPP approach because laparoscopy allows simultaneous bilateral repair through the same port sites. Additionally, occult contralateral hernias were identified in several patients undergoing TAPP repair, highlighting the diagnostic advantage of laparoscopy, as similarly reported by Dhanani NH et al. [17].

The mean operative time was significantly longer in the TAPP group compared to the Lichtenstein group. The increased duration of laparoscopic surgery may be attributed to the creation of pneumoperitoneum, preperitoneal dissection, mesh placement, and closure of the peritoneal flap [18,19]. Similar findings were observed by Loganathan P et al. and Gururaj DM et al., who reported significantly longer operative duration in TAPP repair compared to open repair [14,24].

Postoperative pain assessment using the Visual Analogue Scale demonstrated significantly lower pain scores in the TAPP group at all follow-up intervals. The reduced postoperative pain in TAPP repair can be explained by minimal tissue dissection and avoidance of injury to the inguinal nerves. In contrast, open Lichtenstein repair involves anterior dissection and manipulation of regional nerves, leading to increased postoperative discomfort [20,21]. Similar observations were reported in studies conducted by Loganathan P et al. and Sultan AAEA et al. [14,15]. Postoperative complications such as wound hematoma, wound infection, and groin pain were more frequently observed in the Lichtenstein group, whereas seroma formation was slightly higher in the TAPP group. The smaller port-site incisions and minimal tissue handling in laparoscopic surgery contribute to reduced wound-related complications and superior cosmetic outcomes. Hakeem A et al. and Zargar OU et al. also reported lower wound complication rates and better aesthetic outcomes in laparoscopic hernia repair [22,23].

Hospital stay and return to normal daily activity were significantly shorter in patients undergoing TAPP repair. The minimally invasive nature of the procedure facilitates earlier mobilization, less postoperative pain, and quicker recovery. Comparable findings were documented by

Loganathan P et al., who reported significantly faster recovery and earlier return to work in the TAPP group [14].

Although the cost of TAPP repair was considerably higher because of laparoscopic equipment, mesh fixation devices, and general anesthesia, recurrence rates remained low and comparable in both groups during short-term follow-up [25,26]. Overall, the findings of the present study suggest that TAPP repair offers superior postoperative recovery, less pain, shorter hospitalization, and better cosmetic outcomes, whereas Lichtenstein repair remains a cost-effective and technically simpler procedure with acceptable clinical results.

Conclusion

Both Lichtenstein repair and laparoscopic Transabdominal Preperitoneal (TAPP) repair were found to be safe and effective techniques for the management of inguinal hernia with low recurrence rates. However, TAPP repair demonstrated significant advantages in terms of reduced postoperative pain, shorter hospital stay, earlier return to normal activities, fewer wound-related complications, and superior cosmetic outcomes.

Conversely, Lichtenstein repair remained a technically simpler and more cost-effective procedure with shorter operative duration and satisfactory clinical results. Therefore, while TAPP repair may be preferred in selected patients requiring rapid recovery and better postoperative comfort, Lichtenstein repair continues to be a reliable and practical option, particularly in resource-limited settings.

Acknowledgement

The authors sincerely thank the Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, for their guidance and support throughout the study. We are also grateful to all the patients who participated in this research.

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