Original Research

A COMPARATIVE EVALUATION OF LICHTENSTEIN OPEN MESH REPAIR AND LAPAROSCOPIC HERNIOPLASTY IN THE TREATMENT OF INGUINAL HERNIAS

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ABSTRACT

Background: Inguinal hernia repair is among the most frequently executed operations in general surgery. The Lichtenstein tension-free open mesh hernioplasty is the predominant standard procedure, recognized for its simplicity and minimal recurrence rates. Laparoscopic hernia surgery has become increasingly popular due to less postoperative pain, expedited recovery, and enhanced aesthetic outcomes. Despite these benefits, discrepancies in surgical duration, complications, and resumption of normal activities necessitate additional assessment.

Aims: To compare postoperative outcomes of Lichtenstein's open hernioplasty and laparoscopic hernioplasty in patients with inguinal hernias.

Materials and Methods: This prospective comparative study was conducted in the Department of General Surgery over 15 months and included 70 patients with primary unilateral inguinal hernia. Patients were allocated into two equal groups of 35: Group A underwent Lichtenstein open mesh hernioplasty, and Group B underwent laparoscopic hernioplasty (TAPP/TEP). Inclusion criteria were adults aged 18–70 years with a primary unilateral inguinal hernia. Clinical evaluation, routine investigations, and preoperative assessment were performed for all patients. Operative time, intraoperative events, postoperative pain, analgesic requirement, complications, duration of hospital stay, and time to return to routine activities were recorded. Patients were followed up at one week, one month, three months, and six months to assess wound healing, chronic groin pain, and early recurrence.

Results: The mean operative period was markedly extended in the laparoscopic group relative to the open group. Postoperative pain scores at 24 and 48 hours were markedly lower in Group B, and the requirement for analgesics was diminished. The occurrence of wound-related problems was elevated in Group A, while seroma development was marginally more prevalent in Group B, though not statistically significant. Patients who received laparoscopic surgery experienced a reduced hospital stay and resumed normal daily activities more swiftly than those who underwent open repair. The laparoscopic group exhibited greater cosmetic satisfaction. No significant problems were observed in either group. At the six-month follow-up, no recurrences were seen in either group.

Conclusion: Lichtenstein's open hernioplasty and laparoscopic hernioplasty are both efficacious methods for the correction of inguinal hernias. Laparoscopic repair has distinct benefits, including less postoperative pain, abbreviated hospital stay, and expedited resumption of normal activities, albeit necessitating a greater surgical duration.

Keywords: Inguinal Hernia, Laparoscopic Hernioplasty, Lichtenstein Repair, Postoperative Pain, Recurrence.

INTRODUCTION

Inguinal hernia is one of the most prevalent surgical disorders in general surgery, constituting a substantial percentage of abdominal wall hernias.

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The lifelong chance of getting an inguinal hernia is significantly greater in boys, mostly due to anatomical and developmental factors affecting the inguinal canal.[1,2]

Patients commonly exhibit groin swelling, stiffness, or pain; while inguinal hernias are not invariably life-threatening, they can considerably hinder everyday activities and diminish quality of life if left untreated.[3] Surgical interventions is the definitive approach, designed to reduce symptoms, prevent complications, and reduce the chances of recurrence.[4]

Throughout the decades, numerous procedures for inguinal hernia repair have been created and

enhanced. Conventional tissue-based repairs were linked to considerable postoperative pain, extended hospital stays, and elevated recurrence rates. The advent of mesh-based tension-free methods transformed hernia surgery.[5]

Lichtenstein's open mesh hernioplasty has emerged as one of the most prevalent treatments globally, attributed to its simplicity, consistency, low recurrence rates, and applicability to a diverse patient population. The procedure can be conducted under regional or local anesthetic, rendering it feasible even in resource-constrained environments. Notwithstanding these benefits, postoperative discomfort, wound problems, and protracted recovery to typical activities persist as significant concerns.[6,7]

Advancements in minimally invasive surgery have led to the emergence of laparoscopic hernioplasty as an alternative method. Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal (TEP) repair techniques provide advantages including less postoperative pain, minimum wound problems, expedited mobilization, quicker resumption of work, and enhanced cosmetic results.[8] The posterior approach facilitated by laparoscopy enhances vision of the myopectineal orifice, allowing for the detection of hidden hernias and bilateral abnormalities.[9]

However, despite its benefits, laparoscopic repair necessitates general anesthesia, needs advanced surgical proficiency, entails extended operating duration during the learning curve, and may not be appropriate for all patients.[10]

The decision between Lichtenstein open repair and laparoscopic repair in clinical practice often hinges on patient characteristics, surgeon expertise, institutional resources, and financial implications. Although several research have evaluated these two techniques, discrepancies remain regarding outcomes including operation duration, postoperative pain, complication rates, recovery time, and recurrence.[11] Moreover, in numerous healthcare systems, particularly in developing areas, the open approach remains prevalent, necessitating ongoing assessment of whether laparoscopic repair provides adequate benefits to justify its widespread application.

Aims and Objectives

- To compare postoperative outcomes of Lichtenstein's open hernioplasty and laparoscopic hernioplasty in patients with inguinal hernias.

MATERIALS AND METHODS

This prospective comparative study was conducted in the Department of General Surgery at Sree Mookambika Institute of Medical Sciences over a period of 15 months. A total of 70 patients with a clinical diagnosis of primary unilateral inguinal hernia were enrolled following informed written consent.

Inclusion Criteria:

1. Age between 18 and 70 years.
2. Primary unilateral inguinal hernia confirmed clinically.
3. Patients fit for surgery and suitable for either technique.
4. Patients willing to participate and providing informed consent.

Exclusion Criteria:

1. Recurrent or bilateral inguinal hernias.
2. Complicated hernias such as obstruction, incarceration, or strangulation.
3. Patients unfit for general anesthesia (for the laparoscopic group).
4. Significant cardiopulmonary or systemic comorbidities increasing operative risk.
5. Previous lower abdominal or pelvic surgeries limiting laparoscopic access.
6. Refusal to participate in the study.

All patients underwent standardized preoperative evaluation, including detailed history, physical examination, and routine hematological and radiological investigations. After assessment, the patients were assigned into two equal groups of 35 each.

- Group A underwent Lichtenstein's open mesh hernioplasty
- Group B underwent laparoscopic hernioplasty using either the TAPP or TEP approach

All surgeries were performed by surgeons experienced in both techniques to reduce operator-related variability. Uniform perioperative protocols were followed, including standardized antibiotic prophylaxis. Open repairs were done under spinal or local anesthesia, while laparoscopic repairs were performed under general anesthesia. Operative details, intraoperative findings, and complications such as bleeding, nerve injury, peritoneal breach, or visceral injury were documented. Operative time was recorded from incision to skin closure.

Postoperative care was standardized. Pain was assessed using the Visual Analogue Scale at defined intervals, and analgesic requirements were noted. Patients were monitored for hematoma, seroma, surgical site infection, urinary retention, and mesh-related complications. Hospital stay was recorded until discharge criteria were met.

Functional recovery, including time to resume daily activities and return to work, was assessed. Cosmetic satisfaction was documented at the first follow-up. Patients were followed at one week, one month, three months, and six months to evaluate wound healing, persistent pain, sensory changes, foreign body sensation, testicular complications, and early recurrence. Recurrence was assessed clinically and with ultrasound when indicated.

Data collected from both groups were compiled and analyzed using standard statistical software. Quantitative variables such as operative time, pain scores, and hospital stay were expressed as mean ± standard deviation and compared using the Student's t-test. Categorical variables including complications and recurrence were analyzed using the Chi-square or Fisher's exact test as appropriate. A p value <0.05 was considered statistically significant for all comparisons.

OBSERVATION AND RESULTS

A total of 70 patients with primary unilateral inguinal hernia were included in the study, with 35 patients in each group. Baseline demographic characteristics were comparable between the two groups with no statistically significant differences. (Table 1)

Parameter	Open (n=35)	Laparoscopic (n=35)	p value
Mean Age (years)	48.3 ± 12.6	46.9 ± 11.8	0.62
Male : Female	32 : 3	31 : 4	0.69
Right : Left	21 : 14	23 : 12	0.63
BMI (kg/m²)	23.8 ± 2.4	24.1 ± 2.2	0.57

Table 1: Demographic Profile of the Study Population

Laparoscopic repair required significantly longer operative time ($p < 0.001$). However, pain scores and analgesic requirements were significantly lower in the laparoscopic group ($p < 0.001$). the need for analgesic doses was lower in laparoscopic group ($p < 0.001$). (Table 2)

Parameter	Open (n=35)	Laparoscopic (n=35)	p value
Mean Operative Time (mins)	54.2 ± 9.3	74.6 ± 11.1	<0.001
Mean VAS at 24 hrs	6.1 ± 1.0	4.2 ± 0.8	<0.001
Mean VAS at 48 hrs	4.3 ± 0.9	2.7 ± 0.7	<0.001
Analgesic Doses (first 48 hrs)	3.4 ± 1.1	2.1 ± 0.9	<0.001

Table 2: Operative and Early Postoperative Parameters

Complications were more frequent in the open group, particularly wound infection, but differences were not statistically significant. Seroma was slightly more common in the laparoscopic group. (Table 3)

Complication	Open (n=35)	Laparoscopic (n=35)	p value
Hematoma	3 (8.6%)	1 (2.9%)	0.30
Seroma	2 (5.7%)	3 (8.6%)	0.64
Wound Infection	3 (8.6%)	0 (0%)	0.07
Urinary Retention	2 (5.7%)	1 (2.9%)	0.55
Total Complication Rate	10 (28.6%)	5 (14.3%)	0.11

Table 3: Postoperative Complications

Laparoscopic repair resulted in a significantly shorter hospital stay and faster return to normal activities. Cosmetic satisfaction was notably higher in the laparoscopic group. No recurrence was detected in either group at six months. (Table 4)

Outcome	Open (n=35)	Laparoscopic (n=35)	p value
Hospital Stay (days)	3.4 ± 1.2	2.1 ± 0.8	<0.001
Return to Routine Activities (days)	10.6 ± 2.3	6.8 ± 1.9	<0.001
Chronic Groin Pain at 3 months	4 (11.4%)	1 (2.9%)	0.16
Cosmetic Satisfaction (Excellent)	12 (34.3%)	25 (71.4%)	0.002
Early Recurrence (6 months)	0	0	—

Table 4: Recovery, Hospital Stay, and Follow-Up Outcomes

DISCUSSION

In the present study, seventy patients with primary unilateral inguinal hernia were evaluated, with equal distribution between the Lichtenstein open mesh hernioplasty group and the laparoscopic repair group. Both groups were comparable in baseline characteristics. The mean age of patients was similar, aligning with the demographic patterns reported by Salama M et al.[12] who observed a mean

age of 38.1 ± 17.6 years in their cohort, predominantly comprising males (89.1%).

Comparable age and gender distributions were also noted by Shah MY et al.[13] who reported mean ages of 47.4 ± 14.1 years in TEP and 50.05 ± 13.73 years in Lichtenstein repair, with a clear male predominance, and by Ali M et al.[14] who similarly noted a higher incidence of right-sided and direct hernias.

Operative time in the present study was longer in the laparoscopic group, consistent with findings from several comparative studies. Our laparoscopic repairs averaged 74.6 ± 11.1 minutes, compared to 54.2 ± 9.3 minutes for open repair. This difference parallels the observations of Salama M et al.[12] who reported a mean duration of 99 minutes for laparoscopic repair versus 59.5 minutes for open repair, and Choudhary S et al.[15] who also demonstrated significantly longer operative times in the laparoscopic group (105.38 ± 35.13 minutes vs 79.95 ± 31.12 minutes).

Similar trends were noted by Shah MY et al.[13] where TEP procedures required 84.6 ± 32.2 minutes compared to 59.2 ± 14.8 minutes for Lichtenstein repair, and by Muralidharan V et al.[16] who reported significantly prolonged operative duration for TEP. Sayed S et al.[17] further supported the conclusion that operative time is consistently longer in laparoscopic repair.

Postoperative pain outcomes favored the laparoscopic approach in the present study, with significantly lower pain scores at both 24 and 48 hours, as well as reduced analgesic requirements. This pattern aligns with the findings from Shah MY et al.[13] who documented lower rates of severe pain and significantly reduced chronic pain in TEP patients (3.4%) compared to Lichtenstein repair (22.09%). These trends reflect the reduced tissue trauma and minimized nerve handling associated with laparoscopic repair techniques.

Chronic groin pain was less frequent in the laparoscopic group, in agreement with reported observations from Gopal SV et al.[18] who similarly demonstrated significantly lower chronic pain prevalence in laparoscopic repair compared to Lichtenstein repair.

Early postoperative complications were lower in the laparoscopic group in the present study, echoing observations from earlier reports. Our findings of reduced hematoma, wound infection, and urinary retention in laparoscopic repair are consistent with the results of Salama M et al.[12] who reported fewer wound infections and seromas in laparoscopic procedures. The lower incidence of orchitis and nerve paresis in the laparoscopic group reported by Muralidharan V et al.[16] further supports the superior safety profile of minimally invasive approaches.

In another comparative series, Usman M et al.[19] noted significantly fewer scrotal hematomas in laparoscopic repair. Recurrence rates in our short-term follow-up were nil in both groups, consistent with the short-term outcomes reported by Muralidharan V et al.[16] although Gopal SV et al.[18] demonstrated lower recurrence (1.7%) in TEP compared to Lichtenstein repair (5.1%) over longer follow-up.

Hospital stay and recovery indicators also strongly favored laparoscopic repair in the present study. Laparoscopic patients had shorter hospital stays (2.1 ± 0.8 days) and returned to routine activities significantly earlier (6.8 ± 1.9 days) compared to open repair. These results align closely with those of Choudhary S et al.[15] who found shorter hospitalization and markedly faster return to normal activity in laparoscopic procedures, and with Shah MY et al.[13] who reported significantly shorter recovery duration in the TEP group. Faster postoperative recovery and earlier return to work in the laparoscopic group have also been consistently demonstrated by Sudheer KN et al.[20] Muralidharan V et al.[16] and Amin MF et al.[21] highlighting the functional benefits of minimally invasive repair.

Cosmetic outcomes in the present study were also better in the laparoscopic group, consistent with the minimal incision requirements of TEP and TAPP techniques. This was comparable to the study done by Asencio F et al.[22]

Limitations

The study had a small sample of seventy patients and a short-term follow-up period of six months, constraining the evaluation of long-term recurrence. The single-center design and allocation determined by surgeon choice may result in selection bias. Outcomes may differ based on surgeon expertise and patient comorbidities, which were not thoroughly classified.

CONCLUSION

Lichtenstein open mesh repair and laparoscopic hernioplasty are both successful and safe methods for the correction of primary unilateral inguinal hernias. Laparoscopic repair provides benefits such as diminished postoperative pain, decreased analgesic necessity, abbreviated hospital stay, expedited resumption of daily activities, and enhanced cosmetic satisfaction. The open Lichtenstein repair is technically less complex, requiring a shorter operational duration and exhibiting low intraoperative intricacy. No recurrence was noted in either group throughout the six-month follow-up period. To maximize results and improve patient happiness, the surgical approach should be chosen individually depending on the patient suitability, the surgeon expertise, and the availability of resources.

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Conflicts of Interest:

There are no conflicts of interest

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