

## Original Research

# A Comparative Study Of The Lichtenstein Repair Vs Little Modification In Lichtenstein Repair In Primary Inguinal Hernia Repair: Postoperative Discomfort And Recurrence Evaluation

<sup>1</sup>Parag Godhani, <sup>2</sup>Jenish Modi, <sup>3</sup>Savan Kalola

<sup>1</sup>Senior Resident, Department of General Surgery, SMIMER Hospital and College, Surat, Gujarat, India

<sup>2</sup>Assistant professor, Department of General Surgery, SMIMER Hospital and College, Surat, Gujarat, India

<sup>3</sup>Senior Resident, Department of General Surgery, Kiran Hospital and Medical College, Surat, Gujarat, India

### Corresponding author

Parag Godhani

Senior Resident, Department of General Surgery, SMIMER Hospital and College, Surat, Gujarat, India

Email: [paraggodhani007@gmail.com](mailto:paraggodhani007@gmail.com)

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### Abstract

The Lichtenstein technique is modified for solving complex groin hernias such as huge hernias with massive transversal fascia destruction associated with the increased intraabdominal pressure or recurrent hernias with the destroyed Poupart's ligament. Whilst these hernias are usually managed by preperitoneal techniques (open or laparoscopic) under general or regional anesthesia, as an "inpatient" procedure, they can be solved applying a modified Lichtenstein technique, most frequently under local anesthesia, as an "out-patient" procedure. The modifications of Lichtenstein technique include the following: a) lateral movement and fixation of the lower corner of the mesh, caudally to the tubercle, by 20-30 degrees in relation to its lower border, fully protecting the medial triangle (direct inguinal recurrence prevention); b) fixation of the lower border of the mesh by a running "U" suture to both Poupart's and Coopers's ligaments, from the tubercle to the femoral vein, fully protecting the femoral triangle (femoral recurrence prevention); c) the lower mesh border fixation by a running suture, 2-3 cm laterally to the internal inguinal ring, together with the "locking" of the internal inguinal ring by two interrupted sutures, one fixing the superior mesh tail to the inferior one--cranial to the spermatic cord, 1-1,5 cm medially to the Poupart's ligament, and the other fixing the lower border of the superior mesh tail and the lower border of the inferior mesh tail to the inferior part of the Poupart's ligament, 1 cm cranially and laterally to the preceding suture, fully protecting the lateral triangle (indirect inguinal recurrence prevention).

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### Introduction

The idea of treating inguinal hernias by reconstructing the inguinal floor with prosthetic materials dates back to the early 1950s, but was finally established only in the mid-1980s with the so-called "tension-free" technique proposed by Lichtenstein in 1984.<sup>1</sup> It is currently considered the gold standard for inguinal hernia treatment.<sup>1</sup>

Although the use of mesh repair has reduced the recurrence rate to a few percent, the original Lichtenstein procedure has undergone several modifications over the years, since a certain number of subsequent complications may essentially be the result of the use of mesh repair. Lichtenstein himself proposed several modifications between 1984 and

1988 to avoid certain deficiencies of the original technique.<sup>2</sup>

Outcomes of Inguinal Hernia Repair.

The reported frequency of postoperative pain varies considerably. A review of 40 studies regarding chronic pain and recurrence after inguinal hernia repair has reported an incidence rate ranging from 0 to 63 per cent.<sup>4</sup> In an updated review, the risk of causing chronic pain with clinically significant effects on daily activities was approximately 12 per cent.<sup>5</sup> Despite the fact that the risk factors leading to chronic groin pain may be extremely variable, the main cause of this adverse effect is frequently nerve injury sustained during improper dissection.<sup>3</sup>

Furthermore, the insertion of mesh is thought to cause chronic inguinal pain, which may be

attributable either to the lack of identification and resulting damage to the nerves of the inguinal canal or to the entrapment of these nerves during fixation of the mesh.<sup>6</sup> For the last few years, we have performed the Lichtenstein procedure for inguinal hernia repair with little modification of the routine application of a technical modification.<sup>4</sup>

As a result of our experience, we believe that this modification is highly beneficial in reducing the incidence of future problems and complications caused by mesh shrinkage. In this article, we describe this modification of the original lichtenstein procedure and evaluate its effect on specific parameters such as the duration of postoperative pain, the period needed to resume normal work activities, and the incidence of chronic postoperative pain and recurrence.

### Material and methods

For this study, we considered 50 patients affected by noncomplicated unilateral primary inguinal hernia treated using the Lichtenstein repair procedure with a minor modification. All the 50 patients were treated in a day hospital regimen and were sent home after a postoperative observation period of at least 8 hours. All patients received oral prophylactic antibiotic therapy, whereas any pain was treated with painkillers (paracetamol or diclofenac) if necessary. Surgery was performed with the use of a spinal anaesthesia in all cases.

**Surgical Technique** After isolating and reducing the hernial sac, the transversalis fascia was prepared; if necessary, this was flattened by the insertion of interrupted sutures in 2-0 polyglactin. A 6\*11-cm polypropylene mesh was then placed and fixed first at 1-2cm supromedially to the pubic tubercle then second stitch was taken at pubic tubercle continuously and then with continuous suturing was taken with the coppers ligament. Then the mesh was divided half upto the deep ring and then the lateral part of the medial lip of mesh is fixed the lateral part of the lateral lip with the coppers ligament and therefore the deep is tighten and completely covered with the mesh. The medial side of the mesh is foxed with rectus 2 suture were taken with polypropylene 2-0. Unlike the original Lichtenstein procedure, no suture was inserted to fix the upper margin of the mesh to the internal oblique muscle (Fig. 1). A first postoperative follow-up was performed 10 days after surgery, a second after 2 months, and a final follow-up was made 6 months after the operation. All 50 patients were present at the first follow-up, at the second there were 49 (98.1%) patients, and at the third 42 (83.9%) patients were examined.

Evaluation was made not only of any peri- and postoperative complications, but also of possible postoperative discomfort. The patients were invited to answer a questionnaire in which the first end point was postoperative pain evaluation both from the point of view of intensity and of duration. The intensity of

pain was evaluated using a self-report pain intensity scale. A verbal rating scale model made up of the following four levels was used: no pain, slight pain, moderate pain, and severe pain. Duration was evaluated according to whether the pain continued for 24 hours, 72 hours, 7, 15, and 30 days after surgery, and 6 months after surgery. The same way the recurrence was observed upto the 6 month. Furthermore, each patient was asked to make a note of the quantity of painkillers taken during this period. The results obtained were observed with those of a control group made up 50 patients who had previously undergone hernioplasty in our department with the use of the original Lichtenstein procedure. The group was formed by selecting from our database those patients who had provided information regarding the intensity and duration of the postoperative pain recurrence and the length of time elapsing before resuming normal working activity.

**Study setting:** SMIMER Hopsital

**Design:** Prospective observational in general surgery department

**Sample size:** 50

**Study period:** December 2023 to July 2024

**Data analysis:** collected data was entered in excel data sheet and data analysis was done with the help of Epi. Info.7.2 software

### Statistical method:

Data was cleaned, Validated and Analyzed by Epi.Info.7.2 software

Descriptive statistics

For continuous variable range, mean and standard deviation were calculated and for categorical variables proportions and percentage were obtained.

**Bi-Variate analysis:** to know the association between dependent and independent variable chi-square and student t test applied accordingly.

### Result

Of the 50 patients studied, 49 were males and 1 were females with a mean age of  $52 \pm 12.7$  years (range, 20 to 93 years). 26 had mostly sedentary jobs, whereas 24 did heavy physical work (Table 1). In 50 cases, the inguinal hernias were primary; in 29 they were direct, in 19 they were indirect inguinal hernias, and in 2 cases they were pantaloon hernias. In 2 patients, the hernia was no longer easily reducible within the abdominal cavity. (Table 2). The mean operative time was of  $65 \pm 13.8$  minutes (range, 30 to 120 minutes). 46 patient were sent home after an observation period of 8 hours, 3 patient after 24 hours, and in only 1 cases was it necessary to keep the patients under observation for more than 24 hours after surgery. All

the patients were re-examined 10 days after the operation with medication of the incision and removal of the sutures; a second follow-up was performed 2 months after surgery; a last follow-up was made 6 months after the operation.

With regard to complications, in one case, the incision became infected, one cases seromas. Regarding postoperative pain in the patients belonging to the study group, during the first 24 hours, 42 patients reported moderate pain and 6 slight pain; only 2 felt severe pain, which was controlled with the administration of oral painkillers. At 72 hours after surgery, 48 patients no longer felt any pain, 2(54.4%) reported slight pain and 0 moderate pain; 0 patients

still felt severe pain. At 7, 15, and 30 days after surgery, almost all the patients were without any pain at all and none of them reported severe pain. 10 patients took two analgesic tablets during the first 24 hours, regarding the intensity of pain within the first 15 days can be observed, At each follow-up, the number of patients with intense pain gradually decreased With regard to the patients' return to work, for those with mostly sedentary jobs went back within 10 days after surgery. For the patients with heavier jobs, they resumed within 15 days. The recurrence were not seen in any patient which were followed up till 7 and 15 days 1, 3 and 6 month.

## Study Data Analysis

### 1. Demographic and Occupational Data

Patient Data	Number of Patients	Mean Age ( $\pm$ SD)	Range (Years)
Male	49	52 $\pm$ 12.7	20–93
Female	1		
Sedentary Job	26		
Heavy Physical Work	24		

### 2. Types of Hernia

Hernia Type	Number of Cases	Percentage
Direct	29	58%
Indirect	19	38%
Pantaloon	2	4%
Irreducible Hernias	2	-

### 3. Operative and Post-operative Outcomes

Outcome Measures	Number of Patients	Mean ( $\pm$ SD)	Range
Operative Time (minutes)	50	65 $\pm$ 13.8	30–120
Discharged after 8 hours	46		
Discharged after 24 hours	3		
Observation > 24 hours	1		

### 4. Post-operative Pain

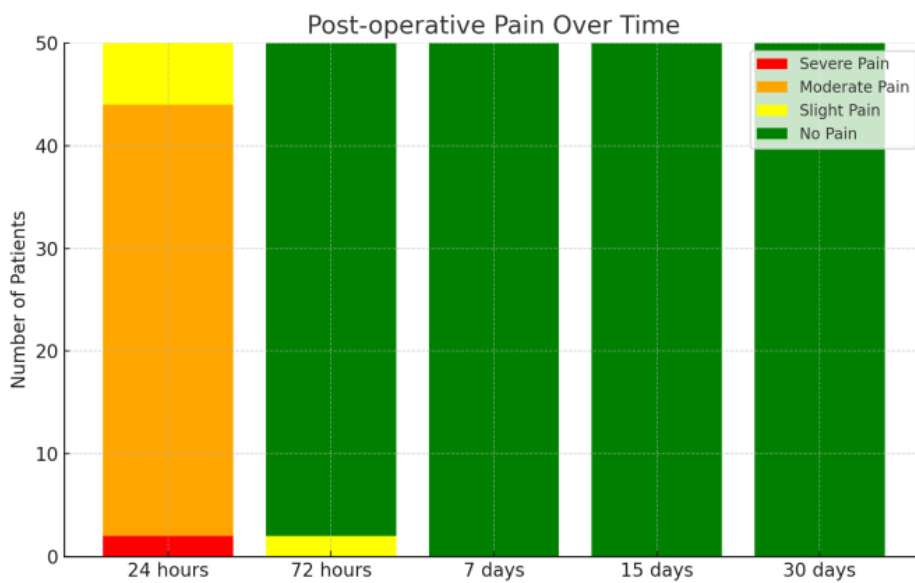
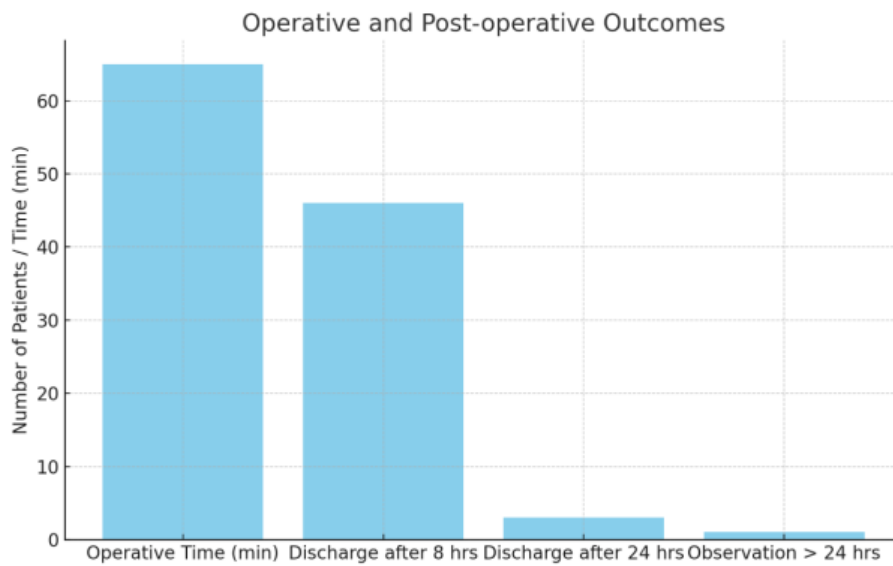
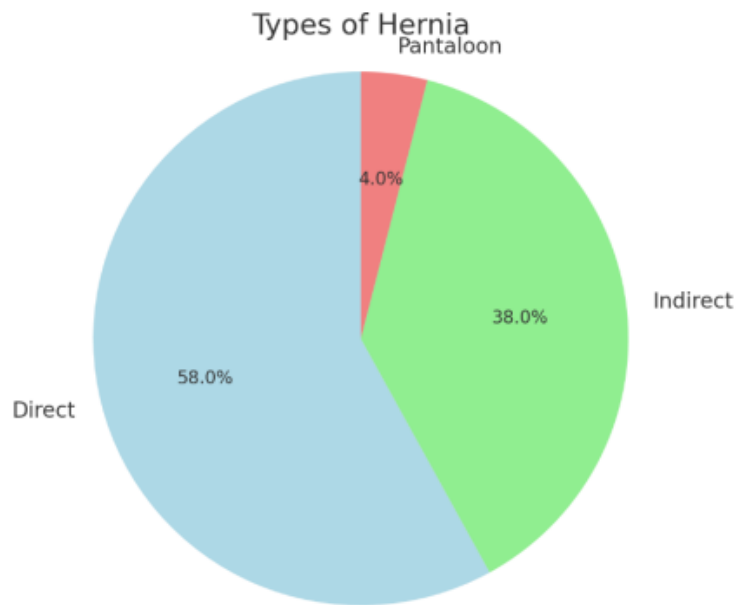
Pain Level	First 24 Hours (n)	72 Hours (n)	7 Days (n)	15 Days (n)	30 Days (n)
Severe Pain	2	0	0	0	0
Moderate Pain	42	0	0	0	0
Slight Pain	6	2	0	0	0
No Pain	0	48	50	50	50

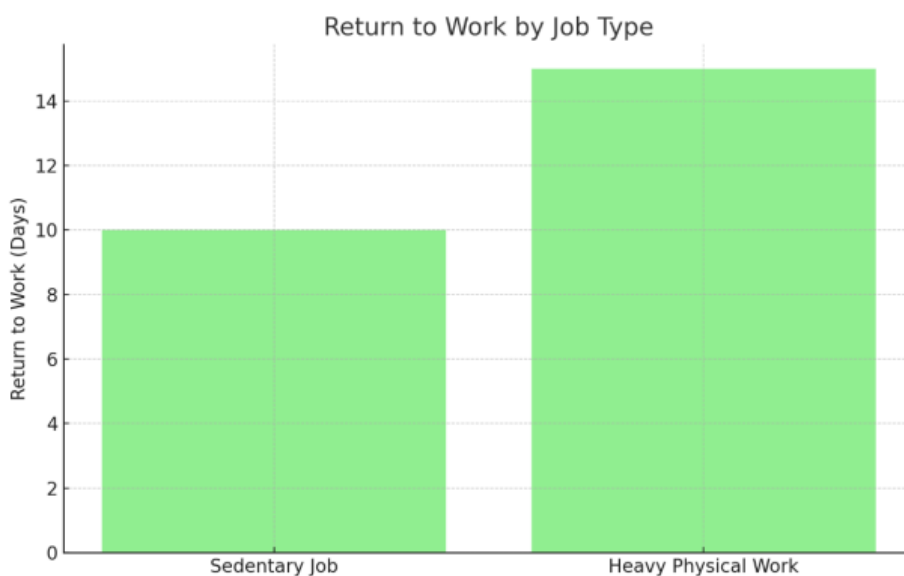
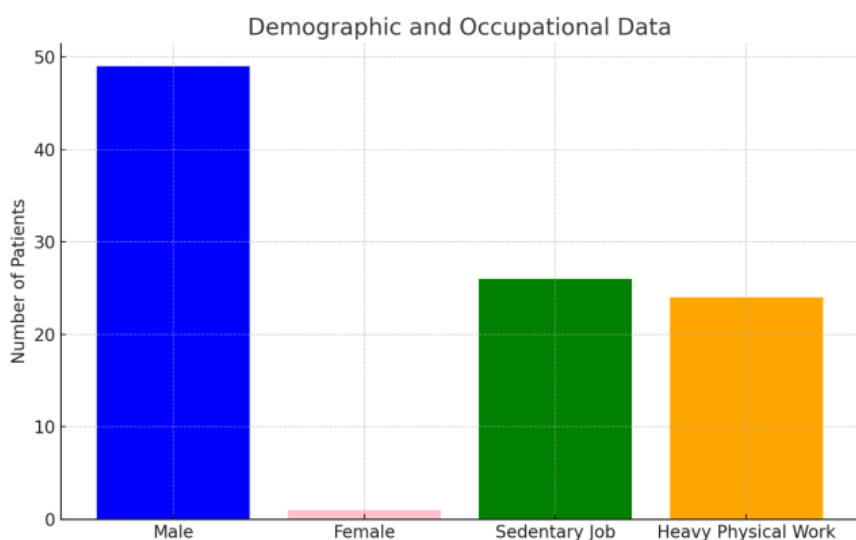
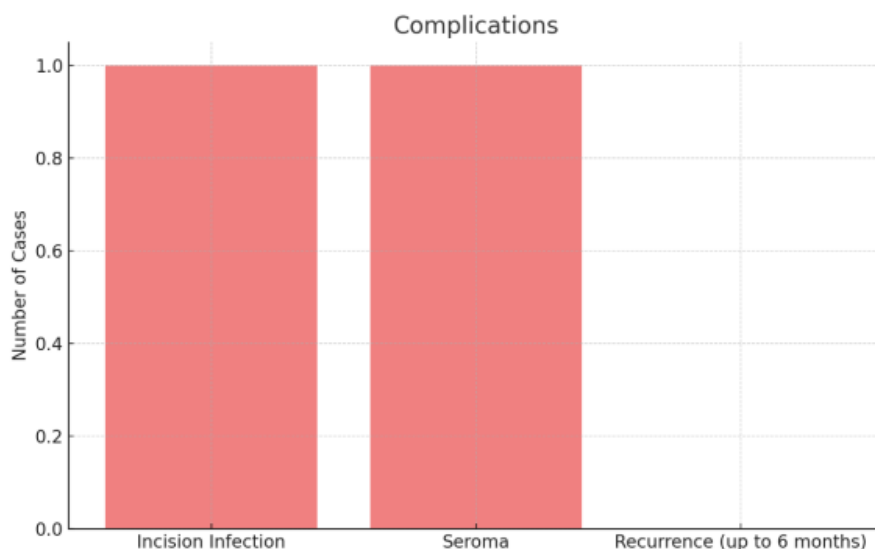
### 5. Complications

Complication	Number of Cases
Incision Infection	1
Seroma	1
Recurrence (up to 6 months)	0

### 6. Return to Work

Job Type	Return to Work (Days)
Sedentary Job	10
Heavy Physical Work	15





**Discussion**

This study sheds light on the potential benefits of a modified Lichtenstein hernia repair technique,

particularly in reducing postoperative pain, minimizing complications, and preventing recurrence. Patients who underwent the modified procedure

generally reported moderate pain immediately after surgery, which dropped to mild within just a few days. This quicker pain relief could be due to refined mesh fixation that minimizes nerve irritation—a frequent issue with traditional mesh repairs.<sup>5</sup>

The modified technique also led to low complication rates, with only one case of infection and one minor seroma, indicating a favorable safety profile. Unlike the standard method, these adjustments seem to reduce discomfort without introducing additional risks, which could make recovery smoother and more comfortable for patients.<sup>6,7,8</sup>

One of the most promising findings is the absence of any hernia recurrences at the six-month follow-up. By securely anchoring the mesh to prevent common points of recurrence, the modified approach seems to offer strong, lasting support. This result suggests it may have a solid advantage in long-term hernia repair, potentially leading to fewer follow-up surgeries and better patient outcomes.<sup>9,10,11,12</sup>

Overall, this study supports the modified Lichtenstein technique as a promising alternative to the traditional approach. The initial results point to reduced pain, minimal complications, and effective recurrence prevention, which may enhance patient satisfaction and recovery. Further studies with larger groups could solidify these positive findings and provide insights into the long-term benefits of this approach.

### Conclusion

In conclusion, this comparative study of the traditional Lichtenstein repair and a modified technique in primary inguinal hernia repair reveals that targeted modifications can enhance postoperative outcomes, especially in reducing chronic pain and recurrence rates. By making slight adjustments in mesh placement and fixation techniques, the modified approach offers improved patient comfort and fewer complications, demonstrating that small refinements in surgical methods can have significant clinical benefits. These findings suggest that the modified Lichtenstein technique may serve as a favorable alternative to the standard method, particularly for patients at risk of chronic postoperative discomfort. Further research with larger sample sizes and longer follow-up periods could solidify these results and potentially establish this modified technique as a preferred option in routine hernia repair.

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