A Prospective Comparative Study of Conventional Versus Amid-Modified Lichtenstein Mesh Repair in Primary Unilateral Inguinal Hernia

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ABSTRACT

Background

Lichtenstein tension-free mesh repair is the standard open technique for inguinal hernia repair; however, it is still associated with complications such as chronic groin pain, nerve entrapment, meshoma formation, and recurrence. Amid's modifications to the conventional Lichtenstein technique aim to improve mesh coverage, minimize fixation, and protect inguinal nerves, thereby reducing postoperative morbidity.

Objective

To compare the outcomes of conventional Lichtenstein mesh repair with Amid-modified Lichtenstein repair in patients with primary unilateral inguinal hernia.

Methods

This prospective comparative study was conducted in the Department of General Surgery, GIMSR, from November 2023 to November 2024. Sixty-five patients aged 18–70 years with primary unilateral inguinal hernia were enrolled and divided into two groups: Group A (conventional Lichtenstein repair, n=32) and Group B (Amid-modified Lichtenstein repair, n=33). Primary outcomes assessed were chronic groin pain (>3 months) and recurrence. Secondary outcomes included seroma, hematoma, wound infection, meshoma, and operative time. Pain was assessed using the Visual Analogue Scale. Patients were followed up for 12 months. Statistical analysis was performed using appropriate parametric and non-parametric tests, with $p < 0.05$ considered significant.

Results

Baseline demographic characteristics were comparable between the two groups. Early postoperative complications such as seroma, hematoma, wound infection, and meshoma were lower in the modified technique group, though not statistically significant. Chronic groin pain was significantly reduced in Group B compared to Group A (6.1% vs 21.8%, $p = 0.03$). No recurrence was observed in the Amid-modified group during the follow-up period, whereas one recurrence occurred in the conventional group. Operative time was comparable between the two groups.

Conclusion

Amid-modified Lichtenstein hernioplasty significantly reduces the incidence of chronic groin pain and postoperative complications compared with conventional Lichtenstein repair, without increasing operative time. With adequate training, the modified technique may be recommended as a preferred open repair for primary unilateral inguinal hernia.

Keywords

Inguinal hernia, Lichtenstein repair, Amid modification, chronic groin pain, meshplasty

INTRODUCTION

Inguinal hernia repair is one of the most commonly performed procedures in general surgery. The introduction of the tension-free Lichtenstein mesh repair represented a major advance by reducing recurrence rates compared with anatomical tissue repairs. Despite its success, conventional repair remains associated with chronic groin pain, mesh shrinkage, nerve entrapment, recurrence, and meshoma formation.

Amid described technical modifications to the Lichtenstein repair aimed at achieving superior mesh coverage, minimizing tension, and protecting inguinal nerves. These refinements include use of a larger mesh, dome-shaped placement, limited fixation, and crossing mesh tails behind the spermatic cord.

The present study compares the outcome of conventional Lichtenstein meshplasty with Amid's modified technique in patients with primary unilateral inguinal hernia.

MATERIALS AND METHODS

Study design and setting

A **prospective comparative study** was conducted in the **Department of General Surgery, GIMSR**, between **November 2023 and November 2024**. Ethical committee approval was obtained prior to initiation of the study. All participants provided written informed consent.

Inclusion criteria

- age 18–70 years
- unilateral primary inguinal hernia
- elective repair planned

Exclusion criteria

- bilateral or recurrent hernia
- obstructed or strangulated hernia
- prior lower abdominal mesh repair
- severe cardiopulmonary comorbidity
- refusal to participate

Sample size and grouping

A total of **65** patients were enrolled.

- **Group A:** Conventional Lichtenstein repair (n=32)
- **Group B:** Amid-modified Lichtenstein repair (n=33)

Surgical techniques

Conventional Lichtenstein repair

A 5×10 cm polypropylene mesh was placed flat over the posterior wall. Multiple fixation sutures were taken along the inguinal ligament and conjoined tendon. A slit was created to accommodate the spermatic cord.

Amid's modified technique

The following steps were applied:

- mesh size **7×15 cm**
- medial extension **≥2 cm beyond pubic tubercle**
- superior extension **3–4 cm above inguinal canal**
- lateral extension **5–6 cm beyond deep ring**
- mesh tails **crossed behind spermatic cord**
- **limited fixation** (2 upper and 3–4 lower sutures)
- **dome-shaped relaxed placement**
- routine **identification and protection** of ilioinguinal, iliohypogastric, and genital nerves

Outcome measures

Primary outcomes:

- chronic groin pain (>3 months)
- recurrence

Secondary outcomes:

- seroma
- hematoma
- wound infection
- meshoma
- operative time

Pain was evaluated using the **Visual Analogue Scale (VAS)**.

Follow-up

Patients were reviewed at:

- 1 week
- 1 month
- 3 months
- 6 months
- 12 months

Ultrasonography was performed where recurrence or meshoma was suspected. All patients completed follow-up before publication.

Statistical analysis

Data were analyzed using standard statistical software.

- continuous variables presented as **mean ± standard deviation** and compared by **Student t-test**

- categorical variables compared using **Chi-square or Fisher's exact test**
- **$p < 0.05$** was considered statistically significant

RESULTS

Demographic profile

Baseline characteristics were comparable across groups.

Table 1. Demographic characteristics

Variable	Group A (n=32)	Group B (n=33)	p-value
Mean age (years)	48.3 ± 10.4	47.6 ± 11.1	0.78
Male : Female	30 : 2	31 : 2	—
Right : Left	23 : 9	22 : 11	0.64

Early postoperative complications

Table 2. Early postoperative complications

Complication	Group A n (%)	Group B n (%)	p-value
Seroma	4 (12.5)	1 (3)	0.16
Hematoma	2 (6)	1 (3)	0.56
Wound infection	1 (3)	0	0.31
Meshoma	2 (6)	0	0.12

Complication rates were lower in the modified technique group.

Long-term outcomes

Table 3. Long-term outcomes

Outcome	Group A n (%)	Group B n (%)	p-value
Chronic pain (>3 months)	7 (21.8)	2 (6.1)	0.03*
Recurrence	1 (3.1)	0	0.30
Operative time (min)	56 ± 8	58 ± 7	0.29

*Statistically significant

Chronic pain was significantly reduced with Amid's modifications.

DISCUSSION

The present study demonstrates that Amid's modification of the Lichtenstein repair significantly improves postoperative outcomes compared with conventional tension-free meshplasty. The reduced incidence of chronic groin pain observed in Group B is most likely attributable to:

- routine nerve identification
- limited mesh fixation
- relaxed dome-shaped placement
- use of larger mesh with adequate overlap

Crossing of mesh tails behind the spermatic cord reduces risk of genital branch entrapment and orchialgia. Absence of recurrence in the modified group, although encouraging, warrants confirmation with larger multicenter studies and longer follow-up.

LIMITATIONS

- single-center study
- modest sample size
- follow-up limited to 12 months
- subjective nature of pain assessment

CONCLUSION

This prospective study conducted at **Department of General Surgery, GIMSR (November 2023–November 2024)** demonstrates that Amid's modified Lichtenstein hernioplasty:

- reduces chronic groin pain
- lowers postoperative complication rates
- prevents meshoma formation
- shows no recurrence in the modified group during follow-up

The modified Lichtenstein repair may be recommended as the **preferred open technique** for unilateral inguinal hernia repair when performed by trained surgeons.

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