PROPHYLACTIC ILIOINGUINAL NEURECTOMY VERSUS NERVE PRESERVATION DURING LICHTENSTEIN TENSION-FREE HERNIOPLASTY: A PROSPECTIVE COMPARATIVE STUDY

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Abstract:

Background: Chronic postoperative groin pain remains a significant complication following Lichtenstein tension-free inguinal hernia repair. Prophylactic ilioinguinal neurectomy has been proposed as a strategy to reduce postoperative neuralgia; however, its routine use remains controversial.

Objective: To compare prophylactic ilioinguinal neurectomy with ilioinguinal nerve preservation during Lichtenstein tension-free hernioplasty with respect to postoperative pain, sensory disturbances, postoperative complications, and return to normal daily activities.

Materials and Methods: This prospective comparative study was conducted in the Department of General Surgery, Sri Devaraj Urs Medical College and Hospital, Kolar. A total of 100 patients with primary unilateral inguinal hernia undergoing elective Lichtenstein tension-free hernioplasty were included. Patients were allocated into two groups using the odd-even allocation technique. Group A underwent prophylactic ilioinguinal neurectomy, whereas Group B underwent ilioinguinal nerve preservation. Postoperative pain was assessed using the Visual Analog Scale (VAS), and patients were followed up for three months.

Results: Patients in the neurectomy group demonstrated significantly lower postoperative pain scores during follow-up. Chronic postoperative groin pain at three months was observed in 12% of patients in Group A compared with 28% in Group B (RR 0.42; 95% CI 0.18–0.91; p=0.031). The neurectomy group also showed reduced analgesic requirement and earlier return to routine activities. Sensory disturbances, including numbness and hypoesthesia, were more common following neurectomy but were generally mild. No significant difference was observed in postoperative complications between the two groups.

Conclusion: Prophylactic ilioinguinal neurectomy was associated with reduced chronic postoperative groin pain, lower analgesic requirement, and earlier return to routine activities compared with nerve preservation. Further studies with longer follow-up are required to evaluate long-term outcomes.

Keywords: Inguinal hernia; Lichtenstein hernioplasty; Ilioinguinal nerve; Neurectomy; Chronic groin pain; Mesh repair

1. Introduction

Inguinal hernia repair is one of the most frequently performed operations in general surgical practice. Among the various operative techniques available, Lichtenstein tension-free mesh hernioplasty remains widely accepted because of its simplicity, low recurrence rates, and reproducible outcomes [1]. Despite advances in surgical techniques and prosthetic mesh materials, chronic postoperative groin pain continues to be a significant source of morbidity following inguinal hernia repair [2].

Chronic groin pain can adversely affect physical activity, occupational performance, and overall quality of life. The development of postoperative neuralgia is multifactorial and may result from nerve injury, mesh-induced fibrosis, inflammatory reactions, neuroma formation, or entrapment of nerves within sutures and scar tissue [3,4]. Among the nerves encountered during open hernia repair, the ilioinguinal nerve is particularly vulnerable because of its close anatomical relationship to the operative field [4].

Traditionally, identification and preservation of the ilioinguinal nerve have been recommended during Lichtenstein hernioplasty to avoid sensory deficits. However, nerve preservation may predispose the nerve to traction injury, fibrosis, or mesh entrapment, potentially contributing to chronic postoperative pain [5]. Consequently, prophylactic ilioinguinal neurectomy has been proposed as an alternative approach to reduce the incidence of chronic neuralgia following mesh hernia repair.

Several studies have evaluated the effectiveness of prophylactic ilioinguinal neurectomy during open inguinal hernia repair. Mui et al. reported a lower incidence of chronic groin pain following prophylactic neurectomy without a significant increase in postoperative morbidity [6]. Similarly, Picchio et al. demonstrated improved postoperative pain outcomes among patients undergoing elective division of the ilioinguinal nerve during mesh hernioplasty [7]. Furthermore, a recent systematic review and meta-analysis suggested that prophylactic neurectomy may reduce chronic postoperative neuralgia, although a higher incidence of sensory disturbances may occur following nerve excision [8].

Despite these findings, the optimal management of the ilioinguinal nerve during Lichtenstein hernioplasty remains controversial because of variations in study design, operative techniques, and methods of postoperative assessment [8,9]. Therefore, the present study was undertaken to compare prophylactic ilioinguinal neurectomy with nerve preservation during Lichtenstein tension-free hernioplasty with respect to postoperative pain, sensory disturbances, postoperative complications, and return to normal daily activities.

2. Materials and Methods

This prospective comparative study was conducted in the Department of General Surgery, Sri Devaraj Urs Medical College and Hospital, Tamaka, Kolar, after obtaining approval from the Central Ethics Committee of Sri Devaraj Urs Academy of Higher Education and Research (SDUAHER) prior to commencement of the study (Ref No: SDUAHER/R&D/CEC/SDUMC-

F/03/SF/-2025-2026; Approval Date: 15 April 2025). Written informed consent was obtained from all participants before enrollment in the study.

A total of 100 patients diagnosed with primary unilateral inguinal hernia and scheduled for elective Lichtenstein tension-free hernioplasty were included. Patients aged 18 years and above who were willing to participate were enrolled in the study. Patients with recurrent hernia, bilateral inguinal hernia, obstructed or strangulated hernia, previous lower abdominal surgery, pre-existing chronic groin pain, peripheral neuropathy, or those unwilling for follow-up were excluded.

Patients were allocated into two groups using the odd-even allocation technique. Group A consisted of 50 patients who underwent prophylactic ilioinguinal neurectomy during Lichtenstein tension-free hernioplasty, while Group B consisted of 50 patients in whom the ilioinguinal nerve was identified and preserved. No formal blinding was performed.

All procedures were carried out using a standardized Lichtenstein tension-free mesh repair technique under spinal or general anesthesia. In Group A, the ilioinguinal nerve was identified and excised after ligation. In Group B, the nerve was carefully identified and preserved throughout the procedure.

Postoperative pain was assessed using the Visual Analog Scale (VAS) during the immediate postoperative period and at one-month and three-month follow-up visits. Sensory disturbances including numbness and hypoesthesia were evaluated clinically. Additional outcomes assessed included postoperative complications, duration of analgesic requirement, and time required for return to normal daily activities.

Data were entered into Microsoft Excel and analyzed using SPSS version 25.0. Continuous variables were expressed as mean ± standard deviation, while categorical variables were expressed as frequencies and percentages. Comparisons between groups were performed using the independent Student’s t-test, Chi-square test, or Fisher’s exact test as appropriate. Relative risk with 95% confidence intervals was calculated for major outcomes. A p-value of less than 0.05 was considered statistically significant.

3. Results and Discussion

A total of 100 patients with primary unilateral inguinal hernia were included in the study and equally allocated into two groups. The baseline demographic and clinical characteristics were comparable between the groups with no statistically significant differences in age, gender distribution, hernia type, side of involvement, or operative duration (Table 1).

Table 1. Baseline Demographic and Clinical Characteristics

Variable	**Group A (Neurectomy) n=50**	**Group B (Preservation) n=50**	**p-value**
Mean age (years)	48.6 ± 12.4	47.9 ± 11.8	0.781

Variable	Group A (Neurectomy) n=50	Group B (Preservation) n=50	p-value
Male gender	47 (94%)	46 (92%)	0.695
Right-sided hernia	31 (62%)	29 (58%)	0.683
Indirect inguinal hernia	34 (68%)	36 (72%)	0.662
Mean duration of surgery (minutes)	58.4 ± 8.6	55.7 ± 7.9	0.108

Postoperative pain assessment demonstrated significantly lower pain scores in patients who underwent prophylactic ilioinguinal neurectomy. The mean Visual Analog Scale (VAS) scores were lower in the neurectomy group during the immediate postoperative period and at both one-month and three-month follow-up visits. Chronic postoperative groin pain at three months was observed in 12% of patients in Group A compared with 28% in Group B (p=0.031), indicating a significant reduction in chronic pain following prophylactic neurectomy.

Table 2. Postoperative Pain Outcomes

Variable	Group A (Neurectomy)	Group B (Preservation)	p-value
Immediate postoperative VAS	3.2 ± 1.1	4.1 ± 1.3	0.002
VAS at 1 month	1.8 ± 0.9	2.9 ± 1.1	<0.001
VAS at 3 months	0.9 ± 0.6	2.1 ± 0.8	<0.001
Chronic groin pain	6 (12%)	14 (28%)	0.031

The reduced incidence of chronic postoperative pain observed following prophylactic neurectomy may be explained by elimination of a potential source of nerve entrapment and fibrosis after mesh placement. Similar findings have been reported by Mui et al. [6] and Picchio et al. [7], who demonstrated lower rates of chronic postoperative pain following elective ilioinguinal nerve division. Cirocchi et al. [8] further reported in their meta-analysis that prophylactic neurectomy was associated with a lower incidence of chronic postoperative neuralgia.

Sensory disturbances were more frequently observed in patients undergoing neurectomy. Numbness occurred in 18% of patients in Group A compared with 6% in Group B, while hypoesthesia was noted in 14% and 4% of patients, respectively. Although these symptoms were more common following nerve excision, they were generally mild and did not interfere significantly with daily activities.

Patients in the neurectomy group required postoperative analgesics for a shorter duration and resumed normal daily activities earlier than those in the nerve preservation group. These findings suggest that reduced postoperative pain may contribute to improved functional recovery and patient satisfaction. Chronic postoperative pain after inguinal hernia repair has been recognized as an important determinant of long-term quality of life and functional outcome [10,11].

Table 3. Postoperative Outcomes and Complications

Variable	**Group A (Neurectomy)**	**Group B (Preservation)**	**p-value**
Numbness	9 (18%)	3 (6%)	0.047
Hypoesthesia	7 (14%)	2 (4%)	0.081
Analgesic requirement (days)	3.1 ± 1.2	4.6 ± 1.5	<0.001
Return to daily activities (days)	8.4 ± 2.1	11.2 ± 2.8	<0.001
Seroma	2 (4%)	3 (6%)	0.647
Hematoma	1 (2%)	2 (4%)	0.558
Wound infection	2 (4%)	2 (4%)	1.000
Recurrence	0	0	—

Postoperative complications including seroma, hematoma, and wound infection were comparable between the two groups, and no recurrence was observed during the three-month follow-up period. The absence of increased morbidity in the neurectomy group is in agreement with previously published studies [6,7].

The present study suggests that prophylactic ilioinguinal neurectomy during Lichtenstein tension-free hernioplasty may reduce chronic postoperative groin pain and improve postoperative recovery without increasing major complications. However, the study was limited by its single-center design, relatively small sample size, and short follow-up duration. Larger multicentric studies with longer follow-up are required to assess long-term recurrence, persistent sensory disturbances, and patient-reported quality-of-life outcomes [10,11].

4. Conclusion

Prophylactic ilioinguinal neurectomy during Lichtenstein tension-free hernioplasty was associated with a lower incidence of chronic postoperative groin pain, reduced analgesic requirement, and earlier return to normal daily activities when compared with ilioinguinal nerve preservation. Although sensory disturbances were more frequently observed following neurectomy, they were generally mild and well tolerated. These findings suggest that prophylactic ilioinguinal neurectomy may be a considered during Lichtenstein tension-free hernioplasty.

Further prospective studies with larger sample sizes and longer follow-up are required to evaluate long-term outcomes and recurrence rates.

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