

# Comparative Study of Preservation versus Elective Division of Ilioinguinal Nerve in Open Mesh Repair of Inguinal Hernia

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## Abstract

**Introduction:** Chronic postherniorrhaphy groin pain is defined as pain lasting for more than 3 months after surgery. It is one of the most important complications occurring after inguinal hernia repair and it occurs with greater frequency than previously thought.

**Aim:** The purpose of this study is to evaluate the effect of routine ilioinguinal nerve excision compared to nerve preservation on chronic groin pain and other sensory symptoms when performing Lichtenstein tension free inguinal hernia repair.

**Materials and Methods:** A total of 60 patients underwent open mesh repair of inguinal hernia were included in the study. The ilioinguinal nerve was identified and preserved in 30 patients (Group A), and elective division of the ilioinguinal nerve was done in 30 patients (Group B). The patients were evaluated for pain and other sensory symptoms at post-operative day 1 (POD-1), at 1 month, at 3 months, and at 6 months after surgery by using 4-point verbal scale.

**Results:** About 50 out of 60 patients completed the study protocol fully. The incidence of post-operative groin pain in this study compared ilioinguinal nerve preservation versus routine excision of ilioinguinal nerve showing was 24 versus 19 at POD-1; 13 versus 10 at 1 month, 26.9% versus 12.5% at 3 months, and 19.2% versus 8.2% at 6 months. The incidence of hypesthesia was 57.6% versus 62.5% at POD-1, 26.9% versus 37.5% at 1 month, and 11.5% versus 16.6% at 6 months. The incidence of post-operative numbness compared ilioinguinal nerve preservation versus nerve excision, results showed 23% versus 25% at 1 month and 11.5% versus 12.5%.

**Conclusion:** The prophylactic excision of the ilioinguinal nerve during Lichtenstein mesh hernia repair decreases the incidence of chronic groin pain after surgery.

**Key words:** Ilioinguinal nerve, Inguinal hernia, Lichtenstein, Neurectomy, Mesh repair

## INTRODUCTION

Hernias may be generally defined as a “protrusion of a viscus or part of a viscus through an abnormal opening in the walls of its containing cavity.”<sup>1</sup> Chronic postherniorrhaphy groin pain is defined as pain lasting for more than 3 months after surgery. It is one of the most important complications

occurring after inguinal hernia repair and it occurs with greater frequency than previously thought. A review of studies published between 1987 and 2000 showed an overall incidence of 25% with 10% of patients having pain fitting a definition of moderate or severe.<sup>2</sup> Incidence of long-term ( $\geq 1$  year) post-operative neuralgia reported for Lichtenstein repair of inguinal hernia range from 6% to 29%,<sup>3</sup> Inguinodynia is the recommended generic term for chronic groin pain after hernia repair and should replace “neuralgia or mesh inguinodynia” to promote uniformity and avoid confusion in the literature.<sup>4</sup> In cases that involves workman's compensation issue, treating a post-surgical patient becomes complicated. Although most legal cases result in out of court settlement, worth noting is the fact that 5-7% of patients with post herniorrhaphy neuralgia

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will sue their surgeons.<sup>5</sup> The concept of routine neurectomy in surgery is not unique to inguinal hernia repairs. Routine neurectomy is often performed during axillary and neck dissections in which the intercostobrachial and greater auricular nerves are sacrificed.<sup>6</sup> Routine ilioinguinal nerve excisions has been proposed as a means to avoid the troubling complication of long term postherniorrhaphy neuralgia.<sup>7,8</sup> Theoretically excision of ilioinguinal nerve would eliminate the possibility of inflammation neuralgia arising from entrapment, neuroma, fibrotic reactions yet controversies persists and the procedure is not widely accepted.<sup>9,10</sup> Many investigators and pioneers started to establish algorithm for management of these chronic pain syndrome; others tried to define a method to prevent this complications rather than treat it. A proposed mechanism for the development of post-operative chronic groin pain is inflammation and fibrosis induced by the mesh, which is in close proximity to the ilioinguinal nerve.<sup>11</sup> The purpose of this study was to evaluate the effect of routine ilioinguinal nerve excision compared to nerve preservation on chronic groin pain and other sensory symptoms when performing Lichtenstein inguinal hernia repair.

### Aim

Aim of the study was to evaluate the effect of preservation versus elective division of the ilioinguinal nerve on chronic groin pain and hypesthesia after Lichtenstein tension free inguinal hernia repair using polypropylene mesh.

## MATERIALS AND METHODS

This is a comparative study was conducted in the Department of Surgery, Sivagangai Medical College Hospital. In this study, the clinical material consists of patients admitted with uncomplicated inguinal hernia (both males and females), 30 cases with ilioinguinal nerve preservation (Group A), and 30 cases with elective division of the nerve (Group B).

### Exclusion Criteria

The patients below 18 and above 60 years, diabetes mellitus, complicated inguinal hernias and recurrent hernias, previous surgery in the inguinal region, mesh allergy and subsequent hernia repair in the observation period, previous history of trauma and pain at the inguinal region.

## RESULTS

A total of 60 patients of uncomplicated inguinal hernia who underwent Lichtenstein mesh hernioplasty included for this Prospective comparative study, 4 of 30 patients in nerve preservation and 6 of 30 patients in nerve excision group were lost to follow-up, leaving 50 patients who

completed the study protocol fully. 26 patients with Nerve preservation (Group A) and 24 patients with nerve excision (Group B) were considered for the study.

In this study, preservation of ilioinguinal nerve during Lichtenstein inguinal hernia repair was performed in 26 patients mean age of  $31 \pm 20$  years including 25 (96%) men and 1 (4%) women. Of the 26 patients, 20 (76%) presented with swelling in the groin only, where 6 (24%) presented with swelling associated with pain. Of the 25 male patients, 4(16%) showed features of bladder outlet obstruction, 7 (28%) had constipation, and 1 (4%) had chronic cough. Moreover, 1 woman had no obvious predisposing factors. Regarding type, 15 (58%) patients had right sided inguinal hernia and 11 (42%) had left side inguinal hernia. Of the 26 patients, 21 (81%) cases were indirect inguinal hernia and 5 (19%) cases were direct hernia. Routine excision of ilioinguinal nerve during Lichtenstein hernia repair was performed in 24 patients; all are male patients with mean age of  $39 \pm 14$  years. Of the 24 patients, 17 (71%) patients presented with swelling in the groin only, whereas 7 (29%) are presented with swelling associated with pain. 6 (25%) patients showed features of bladder outlet obstruction, 5 (21%) had constipation, 2 (8%) had chronic cough. Of the 24 patients, 16 (67%) had right sided inguinal hernia, 6 (25%) had left sided inguinal hernia, and 2 (8%) were bilateral. 18 (78%) patients were indirect inguinal hernia, and 6 (25%) were direct hernia (Table 1).

Post-operative chronic groin pain, hypesthesia, and numbness have been compared between two groups (A and B), at post-operative day 1 (POD-1), at 1 month, at 3 months, at 6 months.

**Table 1: Comparison of study groups**

Variables	Nerve preservation Group A (n=26)	Nerve excision Group B (n=24)
Gender		
Male	25	24
Female	01	0
Age		
Mean age	31±20	39±14
Mode of presentation		
Swelling only	20	17
Swelling with pain	06	07
Strain factors		
BOO	04	06
Constipation	07	05
Chronic cough	01	02
Location		
Right	15	16
Left	11	06
Bilateral	0	02
Type		
Direct	05	06
Indirect	21	18

In this study, the incidence of post-operative neuralgia in Group A (ilioinguinal nerve preservation) was compared with Group B (ilioinguinal nerve excised) during Lichtenstein hernioplasty. The results of the follow-up visits are 24 versus 19 ( $P > 0.05$ ) at POD-1; 13 versus 10 ( $P > 0.05$ ) at 1 month; 10 versus 2 ( $P > 0.05$ ) at 3 months; and 8 versus 1 ( $P < 0.05$ ) at 6 months in Groups A and B, respectively (Table 2).

In this study, severity of pain was compared between Groups A and B, by using 4-point verbal scale. The pain was absent in 2 versus 5, mild in 8 versus 7, moderate in 13 versus 10, and severe in 3 versus 2 at POD-1; absent in 13 versus 14, mild in 6 versus 10, moderate in 6 versus 0, and severe in 1 versus 0 at 1 month; absent in 15 versus 22, mild in 7 versus 2, moderate in 2 versus 0, and severe in 1 versus 0 at 3 months; absent in 19 versus 23, mild in 5 versus 1, and moderate in 3 versus 0; severe in 0 versus 0 months in Groups A and B, respectively. The mean severity score by using 4-point verbal scale in patients who reported post-operative neuralgia was  $1.65 \pm 0.79$  versus  $1.37 \pm 0.92$  at POD-1,  $0.81 \pm 0.94$  versus  $0.42 \pm 0.50$  at 1 month,  $0.58 \pm 0.81$  versus  $0.08 \pm 0.28$  at 3 months, and  $0.39 \pm 0.09$  versus  $0.05 \pm 0.20$  at 6 months in Groups A and B, respectively. There was no statistically significant difference of post-operative neuralgia ( $P > 0.05$ ) at POD-1, at 1 month, and statistical significance at 3 months and at 6 months.

In this study, the incidence of post-operative groin hypesthesia was compared between Groups A and B. The results of the follow-up visits are 57.65% versus 62.5% ( $P > 0.05$ ) at POD-1, 26.9% versus 37.5% ( $P > 0.05$ ) at 1 month, 19.2% versus 20.8% ( $P > 0.05$ ) at 3 months, and 11.6% versus 16.6% ( $P > 0.05$ ) at 6 months in Groups A and B, respectively. Here, the  $P$  value was found to be insignificant ( $P > 0.05$ ) (Table 3).

In this study, the incidence of post-operative numbness was compared between Groups A and B. The results of the follow-up visits are 19.2% versus 12.5% ( $P > 0.05$ ) at POD-1, 23% versus 25% ( $P > 0.05$ ) at 1 month, 15.3% versus 20.8% ( $P > 0.05$ ) at 3 months, and 11.5% versus 12.5% ( $P > 0.05$ ) at 6 months. The difference was insignificant ( $P > 0.05$ ) (Table 4).

## DISCUSSION

The incidence of post-operative groin pain in this study compared ilioinguinal nerve preservation versus routine excision of ilioinguinal nerve showing the results 24 versus 19 at POD-1; 13 versus 10 at 1 month comparable with study conducted by Dittrick *et al.*, 2004;<sup>7</sup> 26.9% versus 12.5% at 3 months correlates well with the study done by

**Table 2: Incidence of post-operative neuralgia**

Severity	Nerve preservation (n=26)		Nerve excision (n=24)		P value
POD-1	2	4	1	9	0.872
1 month	1	3	1	0	0.914
3 months	1	0	0	2	0.095
6 months	0	8	0	1	0.031

POD: Post-operative day

**Table 3: Incidence of post-operative hypesthesia**

Hypesthesia	Nerve preservation (n=26)		Nerve excision (n=24)		P value
POD-1	1	5	1	5	0.754
1 month	0	7	0	9	0.508
3 months	0	5	0	5	0.907
6 months	0	3	0	4	0.751

POD: Post-operative day

**Table 4: Incidence of post-operative numbness**

Numbness	Nerve preservation (n=26)		Nerve excision (n=24)		P value
POD-1	0	5	0	3	0.502
1 month	0	6	0	6	0.901
3 months	0	4	0	5	0.754
6 months	0	3	0	3	0.902

POD: Post-operative day

Malekpour *et al.*, 2008;<sup>12</sup> 19.2% versus 8.2% at 6 months correlates well with studies done by Mui *et al.*, 2006<sup>13</sup> and Dittrick *et al.* 2004.<sup>7</sup> Here, the incidence of pain at POD-1 is not considered for post-operative chronic groin pain. The above table shows the incidence of hypesthesia in the present study compared with two other studies. In the present study, the incidence of post-operative hypesthesia at groin between ilioinguinal nerve preservation and nerve excision during surgery. The results obtained are 57.6% versus 62.5% at POD-1; 26.9% versus 37.5% at 1 month; and 11.5% versus 16.6% at 6 months are comparable with studies conducted by Malekpour *et al.* 2008<sup>12</sup> and Mui *et al.*, 2006.<sup>12,13</sup> In the present study, the incidence of post-operative numbness compared ilioinguinal nerve preservation versus nerve excision, results showing 23% versus 25% at 1 month, and 11.5% versus 12.5% are comparable with results of studies conducted by Picchio *et al.*, 2004<sup>10</sup> and Mui *et al.*, 2006.<sup>13</sup>

## CONCLUSION

The prophylactic excision of ilioinguinal nerve during Lichtenstein mesh hernia repair decreases the incidence of chronic groin pain after surgery. Furthermore, the procedure is not significantly associated with additional morbidities in terms of local cutaneous neurosensory disturbances. Although the study sample and follow period

is short in this study than reported by many previous studies, it is still wise to recommend ilioinguinal neurectomy in patients undergoing anterior inguinal hernia mesh repair. Hence, when performing Lichtenstein inguinal hernia repair, routine ilioinguinal neurectomy is a reasonable option.

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