Ilioinguinal nerve preservation vs prophylactic neurectomy in Lichtenstein tension-free mesh hernioplasty of inguinal hernia: a prospective comparative study

Ahmed Elhodaky, Sherif A. Saber, Osama A. Mansour, Osama Elkhadrawy

Department of General Surgery, Faculty of Medicine, Tanta University, Tanta, Egypt

Correspondence to Ahmed ElHodaky, MSc, Department of General Surgery, Faculty of Medicine, Tanta University, Tanta, 31516, Egypt. Tel: 01013659496; e-mail: dinesh.88560@gmail.com

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Introduction
Chronic groin pain is a significant morbidity following open mesh hernioplasty for inguinal hernia. Although the pain is often mild in nature, different studies have shown that chronic pain, irrespective of severity, can significantly interfere with normal daily activities. Identification and division of the ilioinguinal nerve (IIN) can reduce chronic postoperative inguinal pain as suggested by many authors, yet controversies persist.
Patients and methods
This prospective study was carried out on 240 patients with primary inguinal hernias categorized into two equal groups. Group A patients underwent prophylactic ilioinguinal neurectomy, whereas nerve preservation was done in group B patients during Lichtenstein tension-free mesh hernioplasty for inguinal hernia in the Gastrointestinal and Laparoscopic Surgery Unit, General Surgery Department, Tanta University Hospitals, during the study period (24 months, from January 2017 to December 2018). Follow-up of postoperative groin pain was done on first postoperative day, seventh postoperative day, and after 1, 3, and 6 months using visual analog scale.
Results
The difference between both groups regarding postoperative pain after 6 months at rest was statistically insignificant. However, after minor exercises like coughing 10 times, walking up three flights of stairs, or cycling for 10 min, there was a statistically significant difference, as no pain occurred in group A patients, whereas 30% of group B patients experienced pain ($P<0.05$). The difference between both groups regarding incidence of postoperative sensory changes was statistically insignificant after 6 months of follow-up ($P>0.05$).
Conclusion
Prophylactic ilioinguinal neurectomy may be beneficial in minimizing inguinal neuralgia after mesh hernioplasty of inguinal hernia.

Keywords:
chronic inguinal pain, ilioinguinal nerve, inguinal hernia, inguinodynia, Lichtenstein, neurectomy

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Introduction

Lichtenstein tension-free mesh hernioplasty has been the gold standard for inguinal hernia repair [1]. It is one of the most commonly performed surgeries worldwide [2].

Chronic postoperative inguinal pain (CPIP) is a significant problem lasting at least 2–3 months after surgery. It may affect ~8–16% of patients with inguinal hernia and may impair their daily lives up to 6 months postoperatively [3].

Many factors are attributed to pain incidence, but it is not possible to point to an exact cause for pain in a specific patient. It may be caused by injury to nerves or nerves that have been stuck and damaged by sutures or perforated by fixation devices such as tacks [3].

Ilioinguinal nerve (IIN) is at the most risk for entrapment during open mesh hernioplasty, as it runs in the canal immediately beneath the divided external oblique aponeurosis and can be included in sutures used for the hernia repair or to re-approximate the external oblique fascial flaps [4].

Traditional surgical techniques dictate IIN preservation at all times during repair owing to morbidities associated with not only cutaneous sensory loss but also neuropathic groin pain that may be caused by nerve injury. However, elective

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division of IIN to minimize chronic pain after inguinal mesh hernioplasty has been suggested by some authors [5].

Practice of neurectomy in surgery is not unique to inguinal hernia repair. It is often performed during axillary and neck dissections where the intercostobrachial and greater auricular nerves are divided [6].

So, routine prophylactic excision of the IIN during mesh hernioplasty of inguinal hernia as an attempt to reduce CPIP incidence has been proposed by many studies, yet controversies persist despite promising results by many authors that favor IIN neurectomy [7].

Aim

The aim of this prospective study was to assess the effect of prophylactic ilioinguinal nerve division vs nerve preservation on the incidence and severity of chronic inguinal pain following Lichtenstein tension-free mesh hernioplasty of inguinal hernia.

Patients and methods

The current study is a prospective randomized clinical trial that was conducted on 240 inguinal hernias in adult male patients in the Gastrointestinal and Laparoscopic Surgery Unit, General Surgery Department, Tanta University Hospitals, during the study period (24 months, from January 2017 to December 2018). The study was approved by Ethical Committee of the Faculty of Medicine, Tanta University. A written consent was taken after explanation of risks of postoperative chronic groin pain and how nerve excision can reduce incidence and severity of pain. We included adult male patients with primary inguinal hernia.

The exclusion criteria were as follows:

(1) Recurrent or complicated inguinal hernia.
(2) Associated severe co-morbidities, for example, severe cardiac, renal, or hepatic disease.
(3) Patients with past history of groin surgery, for example, varicocele or undescended testis.
(4) Patients with history of diabetes mellitus, peripheral neuropathy, or impaired cognitive function.
(5) Patients with lower abdominal incision.

Included patients were categorized into two equal groups. IIN was excised in group A patients, whereas it was preserved in group B patients during Lichtenstein tension-free mesh hernioplasty of inguinal hernia. Allocation of patients to any group was randomized using the closed envelope method. Preoperatively, all patients were evaluated by thorough clinical evaluation and laboratory investigations as needed. Pelviabdominal and inguinoscrotal ultrasound investigations were done.

Operative techniques

Pubic hair was shaved immediately before surgery. Spinal anesthesia was used, and if failed, general anesthesia was used. All patients received intravenous antibiotic with induction of anesthesia 'ceftriaxone 1 g' after sensitivity test. All patients underwent Lichtenstein tension-free mesh hernioplasty for inguinal hernia. A 6×11 cm polypropylene mesh was used. IIN was excised in group A patients as far lateral to the internal ring as possible and medially to where it entered the rectus sheath. The cut ends were left free without implantation into muscle. The nerve was preserved throughout the procedure in group B patients.

Postoperative management and follow-up

Follow-up of postoperative pain and sensory changes was done on first and seventh postoperative days (POD) and then after 1, 3, and 6 months. Pain was assessed using visual analog scale (VAS) during rest and after minor activities like coughing for 10 times, walking up three flights of stairs, and walking for 10 min. Sensory changes were assessed using the four-point verbal rating scale (0=absent and 1=present) during rest. Cutoff point using VAS were 1–30 for mild pain, 31–60 for moderate pain, and greater than 60 for severe pain.

All patients were discharged on the second POD.

Postoperative groin pain and sensory changes were recorded before discharge.

On first visit to outpatient clinic on the seventh POD, all patients were examined for any minor postoperative complications like testicular edema, seroma, wound infection, or recurrence. Sutures were removed. Pain and sensory changes were assessed and patients' need for analgesia was recorded. Patients were asked to come for follow-up after 1, 3, and 6 months at the outpatient clinic.

Statistical analysis

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0 (IBM, New York,

USA). Qualitative data were described using number and percentage. The Kolmogorov–Smirnov test was used to verify the normality of distribution. Quantitative data were described using range (minimum and maximum), mean, and SD. Significance of the obtained results was judged at the 5% level.

Results

Our study included 240 adult male patients with primary inguinal hernias categorized into two equal groups. IIN was excised in group A patients, whereas it was preserved in group B patients.

The mean age was 43.55±3.573 and 40.9±2.99 years in group A and group B, respectively (Table 1).

Oblique inguinal hernias were found in 174 patients, 96 (80%) patients in group A and 78 (65%) in group B; 60 (25%) patients had direct hernias, 18 of them were in the group A (15%) and 42 (35%) in group B; and six (5%) patients had pantaloon hernia in group A. The difference between both groups was statistically insignificant (P=0.276). Hernia was on the right side in 138 (57.5%) patients (90 of them were in group A and 48 were in group B) and it was on the left side 102 (42.5%) patients (30 of them were in group A and 72 in group B. There was a statistical difference between both groups regarding the side of hernia (P=0.025) (Table 2).

On first POD, pain was found in all patients of both groups during rest as well as after minor exercise.

On seventh POD, pain was found in 72 (60%) patients in group A compared with 90 (75%) patients in group B during rest, whereas after minor exercise, it was found in 114 (95%) patients in each group.

At 1 month, pain was found in 12 (10%) patients in group A compared with 42 (35%) patients in group B during rest. After minor exercise, it was found in 42 (35%) and 96 (80%) patients in groups A and B, respectively.

At 3 months, pain was absent in group A patients during rest, whereas it occurred in 24 (20%) patients after minor exercise, compared with 24 (20%) and 66 (55%) patients who had pain during rest and after minor exercise in group B, respectively.

At 6 months, pain was absent in group A patients during rest as well as after minor exercise, compared with 24 (20%) and 36 (30%) patients who had pain during rest and after minor exercise in group B, respectively.

The incidence of pain during rest and after minor exercise was significantly lower in group A than in group B (P<0.05) (Figs 1 and 2).

Regarding severity of pain experienced at rest

A total of 60 (50%) patients had mild pain and 60 (50%) patients had moderate pain in group A compared with 24 (20%) patients mild pain, 90 (75%) patients moderate pain, and six (5%) patients severe pain in group B on first POD.

On seventh POD, severity of rest pain was less than before, as 60 (50%) patients has mild pain and 12 (10%) patients has moderate pain in group A compared with 72 (60%) patients with mild pain and 18 (15%) patients with moderate pain in group B, and no one had severe pain at all in both groups.

After 1 month, 12 (10%) patients had mild pain in neurectomy group, whereas the remaining 108 (90%) patients were pain free, whereas in preservation group, 36 (30%) patients had mild pain, six (5%) had moderate pain, and 78 (65%) patients had no pain.

Table 1 Comparison between both groups regarding age

	Group A (n=120)	Group B (n=120)	t	P
Range (years)	19–68	22–73	2.544*	0.652*
Mean±SD	43.55±3.573	42.9±2.99		

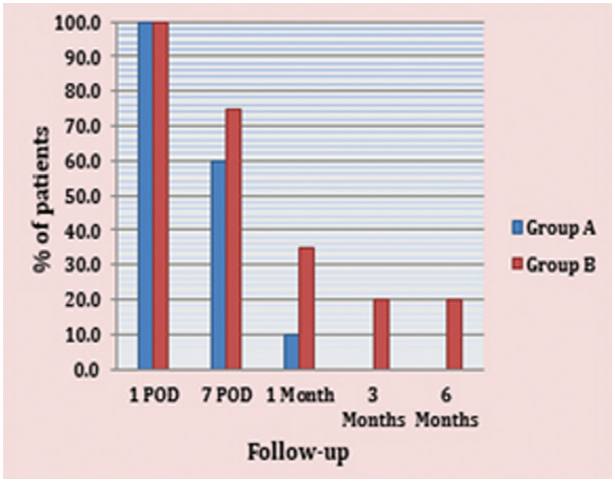
P, P value for comparing between group A and group B; t, Student's t-test. *Statistically significant at $P \leq 0.05$.

Table 2 Side and type of hernia in both groups

Side and type of inguinal hernia	Group A (n=120) [n (%)]	Group B (n=120) [n (%)]	χ^2	P
Right	0 (5)	8 (0)	5.013*	0.025*
Left	930 (725)	472 (460)		
Direct	8 (5)	2 (5)	2.774	^{MC}P=0.276
Oblique	19 (18)	47 (36)		
Pantaloon	66 (05)	80 (50)		

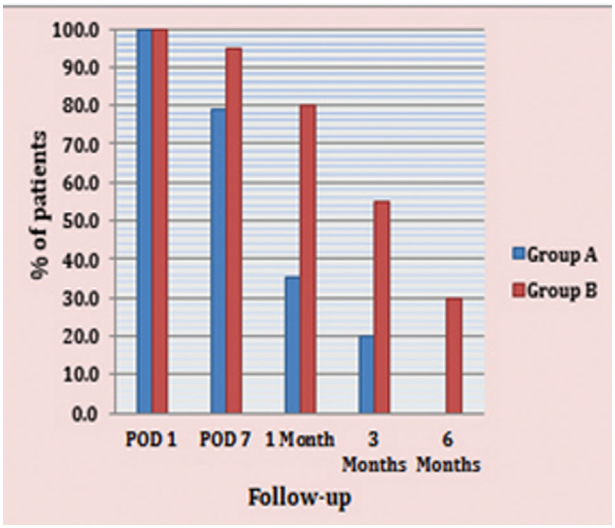
P, P value for comparing between group A and group B; MC, Monte Carlo. *Statistically significant at $P \leq 0.05$.

Figure 1



Incidence of postoperative neuralgia rest.

Figure 2



Incidence of postoperative after minor exercise.

At 3-month and 6-month follow-up, all group A patients had no pain during rest, whereas in group B, 18 (15%) patients still had mild pain and six (5%) patients had moderate pain at 3 months. All 24 (20%) patients in group B reported mild pain at 6-month follow-up. The difference between both groups was found to be statistically insignificant ($P>0.05$) (Table 3).

Regarding severity of pain after minor exercise

Mild pain was recorded in 66 (55%) patients, 24 (20%) patients had moderate pain, and 30 (25%) patients has severe pain in group A, compared with 72 (60%) patients in group B had moderate pain and 48 (40%) patients has severe pain on the first POD.

On seventh POD, 50 (41.7%) patients had mild pain and 54 (37.5%) patients had moderate pain in group Am whereas in group B, 24 (20%) patients had mild pain, 78 (65%) patients had moderate pain, and 12 (10%) patients had severe pain.

After 1 month, 36 (30%) patients had mild pain, six (5%) patients had moderate pain, and 78 (65%) patients had no pain in neurectomy group compared with 66 (55%) patients had mild pain and 30 (25%) patients had moderate pain in preservation group.

At 3 months, in group A, 96 (80%) patients had no pain and 24 (20%) patients had mild pain. In group B, 54 (45%) patients had no pain, 42 (35%) patients experienced mild pain, and 24 (20%) patients had moderate pain.

At 6 months, all patients in group A were pain free, whereas in group B, 36 patients still had pain [24 (20%) had mild pain and 12 (10%) moderate pain].

The difference between both groups regarding severity of postoperative inguinal pain after minor exercises was statistically higher in group B than in group A, especially at follow-up periods 1, 3, and 6 months (P=0.013, 0.033, and 0.018, respectively) (Table 4).

Regarding analgesia requirement

Oral paracetamol was effective in controlling postoperative pain in 108 (45%) patients in both groups, with 78 (65%) patients in group A and 30 (25%) patients in group B, whereas 132 (55%) patients were controlled by injection of ketorolac, with 42 (35%) patients in group A and 90 (75%) patients in group B, on the first POD.

On seventh POD, all patients in group A reported that they no longer required analgesia despite presence of pain especially after minor exercise, whereas in group B, 54 (45%) patients required analgesia, including 42 (35%) patients who were improved by oral paracetamol and 12 (10%) patients with severe pain who were controlled by injection of ketorolac but they did not require analgesia at the end of second postoperative week (Table 5).

No one required opioid analgesia at all in both groups.

The range of duration for which patients required analgesia in group A was 2–6 days, with mean of 3.45±0.3118 days. In group B, the range was 5–14 days, with mean of 9.8±0.67121 days. The difference between both groups regarding type and duration of

Table 3 Severity of postoperative inguinal pain during rest

	Group A (*n*=120) [*n* (%)]	Group B (*n*=120) [*n* (%)]	χ^2	*P*
First POD				
No pain	0	0	4.409	^{MC}P=0.099
Mild pain ≤30	60 (50)	24 (20)		
Moderate pain (31–60)	60 (50)	90 (75)		
Severe pain >60	0	6 (5)		
Seventh POD				
No pain	48 (40)	30 (25)	1.135	^{MC}P=0.657
Mild pain ≤30	60 (50)	72 (60)		
Moderate pain (31–60)	12 (10)	18 (15)		
Severe pain >60	0	0		
1 month				
No pain	108 (90)	78 (65)	3.617	^{MC}p=0.124
Mild pain ≤30	12 (10)	36 (30)		
Moderate pain (31–60)	0	6 (5)		
Severe pain >60	0	0		
3 months				
No pain	120 (100)	96 (80)	3.978	^{MC}P=0.112
Mild pain ≤30	0	18 (15)		
Moderate pain (31–60)	0	24 (5)		
Severe pain >60	0	0		
6 months				
No pain	120 (100)	96 (80)	4.444	^{FE}p=0.106
Mild pain ≤30	0	24 (20)		
Moderate pain (31–60)	0	0		
Severe pain >60	0	0		

MC, Monte Carlo; *P*, *P* value for comparing between group A and group B. *Statistically significant at $P \leq 0.05$.

Table 4 Severity of postoperative inguinal pain after minor exercises

	Group A (*n*=120) [*n* (%)]	Group B (*n*=120) [*n* (%)]	χ^2	*P*
First POD				
No pain	0	0	15.692*	<0.001*
Mild pain ≤30	66 (55)	0		
Moderate pain (31–60)	24 (20)	72 (60)		
Severe pain >60	30 (25)	48 (40)		
Seventh POD				
No pain	25 (20.8)	6 (5)	5.988	^{MC}p=0.046*
Mild pain ≤30	50 (41.6)	24 (20)		
Moderate pain (31–60)	45 (37.5)	78 (65)		
Severe pain >60	0	12 (10)		
1 month				
No pain	78 (65)	24 (20)	8.464*	^{MC}p=0.013*
Mild pain ≤30	36 (30)	66 (55)		
Moderate pain (31–60)	6 (5)	30 (25)		
Severe pain >60	0	0		
3 months				
No pain	96 (80)	54 (45)	6.423*	^{MC}p=0.033*
Mild pain ≤30	24 (20)	42 (35)		
Moderate pain (31–60)	0	24 (20)		
Severe pain >60	0	0		
6 months				
No pain	120 (100)	84 (70)	6.371	^{MC}p=0.018*
Mild pain ≤30	0	24 (20)		
Moderate pain (31–60)	0	12 (0)		
Severe pain >60	0	0		

MC, Monte Carlo; *P*, *P* value for comparing between group A and group B. *Statistically significant at $P \leq 0.05$.

Table 5 Comparison between both groups regarding analgesia requirements

Patients required analgesia	Group A (*n*=120) [*n* (%)]	Group B (*n*=120) [*n* (%)]	Test of significance	*P*
First postoperative 24 h				
Patients required no analgesia	0	0	χ^2=6.465*	0.011*
Patients controlled by oral paracetamol	78 (65)	30 (25)		
Patients controlled by injection Ketorolac	42 (35)	90 (75)		
Seventh POD				
Patients required no analgesia	120 (100)	66 (55)	χ^2=11.503*	^{MC}P=0.002*
Patients controlled by oral paracetamol	0	42 (35)		
Patients controlled by injection Ketorolac	0	12 (10)		
Mean±SD	3.45±0.311	9.8±0.671	*t*=38.371*	<0.001*
Range (days)	2–6	5–14		

MC, Monte Carlo; *P*, *P* value for comparing between group A and group B; POD, postoperative days. *Statistically significant at $P \leq 0.05$.

Table 6 Mean of visual analog scale during rest and after minor exercise

	Group A (*n*=120) (mean±SD)		Group B (*n*=120) (mean±SD)		t_1 (P_1)	t_2 (P_2)
	During rest	After minor exercise	During rest	After minor exercise		
First POD	33.25±3.1	53±3.429	41.25±2.7	62.25±2.8	8.563 (<0.001*)	9.236 (<0.001*)
Seventh POD	14.75±3.3	32.75±3.5	20±3.162	41±3.674	5.131 (<0.001*)	7.236 (<0.001*)
1 month	2.5±1.75	10±3.46	7.75±2.65	23.75±3.3	7.393 (<0.001*)	12.750 (<0.001*)
3 months	0	4.75±2.22	4.25±2.12	15.5±3.64	–	6.593 (<0.001*)
6 months	0	0	3±1.37	7.5±2.86	–	–

MC, Monte Carlo; *P*; *P* value for comparing between group A and group B; POD, postoperative days. *Statistically significant at $P \leq 0.05$.

analgesia were statistically significantly higher in group B patients than in group A (*P*? 0.05).

In both groups, pain during rest was much lower than after minor exercises. Mean VAS in group A patients was less than that of group B. Moreover at later follow-up periods, it was less than at earlier ones. The difference between both groups was statistically significant lower for patients in group A than in group B regarding mean of pain score at all follow-up periods during rest as well as after minor exercises (*P*? 0.05) (Table 6).

Regarding the incidence of postoperative sensory abnormalities

On first POD, numbness was present in 30 (25%) patients and hypoesthesia in 36 (30%) patients in group A. However, in group B, hypoesthesia was present in 12 (10%) patients, and no numbness was reported.

On seventh POD, 30 (25%) patients had numbness in group A only. Hypoesthesia was found in 24 (20%) patients and six (5%) patients in group A and group B, respectively.

At 1 month, numbness and hypoesthesia were recorded in 18 (15%) and 42 (35%), respectively, of group A patients, compared with 12 (10%) and 18 (15%) patients, respectively, in group B.

At 3 months, numbness was present in 24 (20%) and 12 (10%) patients in groups A and B, respectively. Hypoesthesia was found in 12 (10%) patients in group A.

At 6 months, numbness was the only sensory change that was recorded, and it was found in 18 (15%) and 12 (10%) patients in groups A and B, respectively. The difference between both groups regarding incidence of postoperative sensory changes was statistically insignificant except for the incidence of numbness on first and seventh POD; it was lower in preservation than neurectomy group (*P*=0.047) (Table 7).

Discussion

CPIP is one of the most disabling morbidities following mesh hernioplasty, which can adversely affect the daily life for up to 10% of patients with inguinal hernia [8,9]. It may occur secondary to nerve entrapment, stretching, inflammation, fibrotic reactions after mesh implantation, or neuroma formation. Its management may require numerous interventions, including oral analgesia, local anesthetic injections, physiotherapy, or further remedial surgery [10]. Many authors suggested that identification and division of the IIN can reduce chronic inguinal pain after hernia repair [11].

Our patients were all males, similar to the studies done by Omar *et al.* [12] and Chatterjee *et al.* [13]. In two

Table 7 Incidence of postoperative numbness/hypoesthesia

	Group A (*n*=120) [*n* (%)]	Group B (*n*=120) [*n* (%)]	χ^2	*P*
First POD				
Numbness	30 (25)	0	5.714*	^{FE}P=0.047*
Hypoesthesia	36 (30)	12 (10)	2.500	^{FE}P=0.235
Seventh POD				
Numbness	30 (25)	0	5.714*	^{FE}P=0.047*
Hypoesthesia	24 (20)	6 (5)	2.057	^{FE}P=0.342
1 month				
Numbness	18 (15)	12 (10)	0.229	^{FE}P=1.000
Hypoesthesia	42 (35)	18 (15)	2.133	^{FE}P=0.144
3 months				
Numbness	24 (20)	12 (10)	0.173	^{FE}P=1.000
Hypoesthesia	12 (10)	0	2.105	^{FE}P=0.487
6 months				
Numbness	18 (15)	12 (10)	0.229	^{FE}P=1.000
Hypoesthesia	0	0	–	–

FE, Fisher's exact test; *P*, *P* value for comparing between group A and group B; POD, postoperative days. *Statistically significant at $P \leq 0.05$.

large studies, the authors found that women reported more severe acute postoperative pain in general, which might be attributed to estrogen modulation of nociceptive processing [14,15].

The mean age of patients in group A was 43.55±3.573 years, and it was 40.9±2.99 years for group B (*P*=0.015), compared with 39±14 and 31±20 years for neurectomy and preservation groups, respectively, in a study by Amuthan *et al.* [16]. The younger age recorded in their study was found to be an independent demographic risk factor for the high incidence of postoperative pain, as return of these younger patients to full activity was much earlier than older ones.

Our results coincided with the study done by Mohanapriya *et al.* [17], in which the incidence of pain during rest was 6.7% in group A at 1 month compared with 10% in group B. At 4 and 8 months, neurectomy group patients reported that there was no pain at all, whereas it was seen in 10% of preservation group patients. The difference between both groups was found to be statistically insignificant after 8 months (*P*=0.153). After normal daily activities, incidence of pain was nearly equal in both groups at 1 month, whereas it was statistically significant lower in neurectomy group than preservation group after 8 months (*P*=0.001). During vigorous activity, pain was also almost equal in both groups at 1 month, whereas after 8 months, there was a significant difference, because pain persisted in 11 patients in preservation group compared with only four patients in neurectomy group (*P*=0.004).

Moreover, Dittrick *et al.* [10], found the same results when performing retrospective chart review on 90 patients (60 underwent IIN excision and 24 preservation). At 1 month postoperatively, there was a statistically significant higher pain in preservation group (21 vs 5%), and after 6 and 12 months, preservation group still had significantly higher pain than elective neurectomy group (26 vs 3% and 25 vs 3%, respectively).

Concerning the severity of experienced postoperative groin pain, we found that the difference between both groups during rest at the end of follow-up period was statistically insignificant (*P*=0.106). After minor exercises, it was significantly lower in group A compared with group B, especially at later follow-up periods (*P*=0.018).

Our work agreed with the study by Amutha *et al.* [18] study, which found fewer incidences of moderate/severe pain among neurectomy group patients than preservation group.

Mulkipatil *et al.* [5] also concluded that pain was more severe among patients of nerve preservation group than neurectomy group.

The meta-analysis done by Charalambous *et al.* [19] which included nine randomized control trials evaluating 1510 patients, having either elective IIN division (733 patients) or nerve preservation (777 patients), also supported our results, as it showed that the incidence of experienced chronic inguinal pain when the nerve was preserved at 6 months was 9.4% and at 1 year was 4.8%, whereas identification and

IIN division has significantly reduced the incidence of pain at follow-up 6 months after surgery (P=0.02). Moreover, it decreased the risk of moderate/severe pain (P=0.01). However, the advantage of neurectomy on the incidence of chronic inguinal pain has been reduced, with no significant difference in the rates of inguinal pain (P=0.38) or of moderate/severe groin pain (P=0.98) between both groups during follow-up at 1 year postoperatively.

In this study, analgesia requirement in neurectomy group patients was lower than preservation group on the first POD and seventh POD. Despite mild and moderate grades of pain were present on exercise at 1, 3, and 6 months of follow-up, especially in preservation group, the difference between both groups regarding analgesia requirement was insignificant.

Sunkar *et al.* [20] compared analgesia requirement between both groups at 6 months after surgery and reported that none of the patients in neurectomy group had to take pain medication, whereas there were six patients in preservation group who required analgesia. None of the 100 patients enrolled in the study required anything stronger than NSAIDs for pain relief.

The early results (at first and seventh POD) reported by Omar *et al.* [12] were quite different from ours, as they had insignificant difference between both groups regarding grades of pain, and so there was no significant difference in analgesia requirement between both groups in their early follow-up periods.

The major disadvantage of neurectomy of the IIN is the morbidity associated with numbness and/or sensory loss over the groin region [21]. On first POD, incidence of numbness and hypoesthesia in our patients was significantly higher in neurectomy group, whereas on seventh POD, only numbness was significantly higher in neurectomy group. At 1, 3, and 6 months, there was no statistically significant difference between both groups regarding numbness and hypoesthesia.Although Bansal *et al.* [22] had higher number of patients in neurectomy group with numbness after 1, 3, and 6 months of follow-up, the difference was statistically insignificant. None of their patients considered these symptoms incapacitating as they improved gradually with time. The authors have attributed this improvement to progressive compensation from adjacent sensory nerves.

Neogi *et al.* [23] and Mui *et al.* [24] reported that the difference between both groups regarding incidence of postoperative groin numbness or sensory changes at 1 and 6 months postoperatively was insignificant.

Theoretically, IIN excision might eliminate the incidence of postoperative neuralgia that may occur secondary to entrapment, inflammation, neuroma, or fibrotic reactions induced by implanted mesh. Joshi [25] reported that preserving IIN leads to almost two folds increase in the incidence of chronic groin pain. He showed in his study marked reduction in the incidence of CPIP after nerve division when compared with nerve preservation (20 vs 35.6%) and chronic severe pain that may require frequent follow-up in the hospital and regular use of analgesics in 2.1% in the preservation group.

Amid [26] resected all 3 inguinal nerves [IIN, iliohypogastric nerve (IHN), and genital branch of genitofemoral nerve (GFN)] to include the numerous neural communications existing among the three inguinal nerves.

The report from the Danish hernia database showed that the incidence of chronic pain 1 year after surgery is nearly 29%, with 11% of patients complaining of severe pain [27]. Severe pain has been noted to be around 1.5–3% 1 year after surgery [28].

Conclusion

The present prospective comparative study revealed not only lower incidence of postoperative chronic groin pain but also decreased pain severity among neurectomy group patients. The procedure was not significantly associated with additional morbidities in terms of local cutaneous sensory changes as the incidence of hypoesthesia/numbness was insignificant in both groups at most follow-up periods. It is still beneficiary to reduce postoperative neuralgia, with not much difference regarding other morbidities. So, it is wiser to recommend routine IIN excision in patients undergoing Lichtenstein tension-free mesh hernioplasty for inguinal hernia.

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Conflicts of interest

There are no conflicts of interest.

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