

Comparative Study between Prophylactic Ilioinguinal Neurectomy and Nerve Preservation in Open Inguinal Hernia Repair

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ABSTRACT

BACKGROUND

Chronic groin pain is a significant clinical problem in patients undergoing open hernia repair which interferes with daily activities. Traditional surgical technique dictates preservation of nerve; however, recent studies have shown that excision of nerve during hernia repair was associated with lower incidence of chronic groin pain. The aim of this study was to assess the effectiveness of prophylactic ilioinguinal neurectomy in reducing chronic groin pain following open hernia repair.

METHODS

110 patients undergoing hernioplasty for inguinal hernia were divided into two groups. In group A, there were 55 patients who were subjected to prophylactic ilioinguinal neurectomy and in group B there were 55 patients in whom preservation of ilioinguinal nerve was done during the hernia repair. Patients were followed up at 1 month and 6 months following surgery to assess the incidence of chronic groin pain and pain during daily activities.

RESULTS

At 1 month follow up there was no significant difference between the two groups regarding incidence of chronic groin pain or pain during daily activities. However, the incidence of chronic groin pain was significantly lower in Group A compared to Group B at 6 months follow up.

CONCLUSIONS

Prophylactic ilioinguinal neurectomy during open hernia surgery significantly reduces the incidence of chronic groin pain without any morbidity.

KEYWORDS

Inguinal Hernia, Open Inguinal Hernia Repair, Chronic Groin Pain, Ilioinguinal Neurectomy

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BACKGROUND

One of the most common post-operative complications following open hernioplasty is chronic groin pain with the incidence ranging 19 % to 63 %.^{1,2,3,4} This occurs due to injury to ilioinguinal nerve which is a sensory nerve innervating the skin over the groin region, the medial aspect of thigh, upper part of scrotum and the root of penis. Chronic groin pain can be divided into two types either neuropathic pain or nociceptive pain. Neuropathic pain is due to entrapment of nerve by perineural fibrosis, mesh or suture.⁵ Neuropathic pain also occurs due to direct nerve damage by transection, excessive traction or by coagulating the nerve.⁶ Nociceptive groin pain is due to mesh fibrosis, mesh displacement or contraction.⁷ This chronic groin pain is usually mild in nature but it interferes significantly with normal daily activities.^{8,9} Traditional surgical technique insists the nerve to be preserved during open hernia surgery because of the morbidity associated with chronic groin pain. Recent studies have reported minimal morbidities following elective excision of ilioinguinal nerve.^{10,11} Treatment options of chronic groin pain includes NSAIDS, peripheral nerve block, laser therapy, pulsed radio frequency.¹² Surgical option for chronic groin pain include selective ilioinguinal neurectomy, removal of mesh.¹³ Ilioinguinal neurectomy is better in relieving chronic groin pain compared to removal of mesh.^{14,15} More recently some retrospective studies have shown lower incidence of chronic groin pain when ilioinguinal neurectomy done prophylactically during surgery.^{16,17,18}

In this trial, we compared prophylactic ilioinguinal neurectomy vs. preserving the nerve and the incidence of chronic groin pain after Lichtenstein repair in a prospective randomized controlled manner. The associated neurosensory disturbances and the quality of life were also investigated.

The aim of this study is to compare the effectiveness, advantages and disadvantages of prophylactic ilioinguinal neurectomy versus preserving the nerve during open inguinal hernia repair.

METHODS

The study was conducted in the Department of General Surgery, IGMCRI, Pondicherry from June 2018 to June 2019. Patients were selected from those admitted to Department of General Surgery, IGMCRI and undergoing open hernioplasty.

Inclusion Criteria

- Male patients with unilateral inguinal hernia above 18 years.
- Patients undergoing open hernioplasty.
- Patient willing to give informed consent.

Exclusion Criteria

- Female inguinal hernia patients.
- Bilateral inguinal hernia, complicated hernias like obstruction, strangulation.
- History of previous abdominal surgery.
- History of peripheral neuropathy.
- Patient unfit for surgery.

Number of patients studied was 110. Patients were divided into two groups of 55 each based on odd and even admissions. Informed consent was received from all participants before procedure. All 110 patients were subjected to standard meshplasty as described by Lichtenstein et al.¹⁹ In group a (55 pts.) the ilioinguinal nerve was identified within external oblique aponeurosis and the whole nerve was excised up to the deep ring laterally and medially where it entered the rectus. The nerve was sent for histopathological confirmation. In group B (55 pts.) the ilioinguinal nerve was completely protected. In both groups a 7 * 15 mesh was secured to the floor of the inguinal canal with polypropylene sutures.

All patients were shifted to post - operative ward and were assessed for immediate post - operative pain. Early post - operative complications were recorded. Patients were followed up at 1 month and 6 months and assessment of chronic groin pain with its implication in daily activities (pain while coughing, walking, cycling) were recorded. Groin region numbness were also recorded.

Types of Intervention

- Prophylactic ilioinguinal neurectomy.
- Preservation of ilioinguinal nerve.

Outcome Measure

- Immediate post-operative pain.
- Wound infection.
- Haematoma.
- Retention of urine.
- Inguinal pain after 1 month and its impact in daily activity.
- Inguinal pain after 6 months and its impact in daily activity.

Statistical Analysis

Statistical analysis was based on intention to treat analysis and was performed with statistical software Statistical Package for Social Science (version 11.0 for Windows, SPSS, Inc., Chicago IL.). Analysis of my study will be by standard -t' test, chi - square method.

RESULTS

110 patients of inguinal hernia were taken up for study at the Indira Gandhi Medical College and Hospitals, Pondicherry, during the period of June 2018 and June 2019. They were divided into group A (55) where prophylactic ilioinguinal neurectomy was done and group B (55) where the ilioinguinal nerve was preserved.

The mean age of patients in group A was 43.7 ± 6.43 and in group B was 42.8 ± 8.2 . Both groups were comparable with regard to type of anaesthesia, hernia side, education level, baseline pain measurements during various activities. Table 1 and graph 1 shows mean age and other baseline characteristics between two groups.

	Group A (Prophylactic Neurectomy) n = 55	Group B (Preservation of Nerve) n= 55	P Value
Age	43.7 $\pm$ 6.43	42.8 $\pm$ 8.2	0.43
Type of anaesthesia (spinal: general)	30 : 25	32 : 23	0.70
Hernia side (right : left)	37 : 18	42 : 13	0.29
Pain at rest (no pain: mild pain)	48 : 07	51 : 04	0.34
Pain while straining (no pain: mild pain)	41 : 14	39 : 16	0.67
Pain while cycling (no pain: mild pain)	37 : 18	35 : 20	0.69

Table 1. Age and Baseline Characteristics

Parameters	Group A (Prophylactic Neurectomy) n = 55	Group B (Preservation of Nerve) n= 55	P Value
Haematoma	11	12	0.81
Urinary retention	2	1	0.55
Wound infection	1	2	0.55

Table 2. Early Post-Operative Complication

Parameter	Group A (Prophylactic Neurectomy) n=55	Group B (Nerve Preserved) n=55	P Value
Incidence of chronic groin pain	47	48	0.78
Pain at rest (no pain: mild pain)	40 : 7	42 : 6	0.73
Pain while coughing (no pain: mild pain)	38 : 9	39 : 9	0.96
Pain during walking for 10 min (no pain: mild pain)	37 : 10	37 : 11	0.84
Pain during cycling for 10 min (no pain: mild pain)	37 : 10	36 : 12	0.66

Table 3. Result at 1 Month Follow Up

All patients in both group had mild pain (1 - 3) to moderate pain (4 - 6) as per the numeric pain rating scale at 12 and 24 hours. NSAIDS was used to treat the immediate post-operative pain in both groups.

Incidence of early post - operative complications were compared in both groups. Haematoma was seen in 11 patients in group A and 12 patients in group B with p value 0.81 (Not significant). Urinary retention was seen in 2 patients in group A and in 1 patient in group B with p value 0.55 (not significant). Wound infection was seen in 1 patient in group A and 2 patient in group B with p value 0.55 (not

significant). Table 2 shows early complication rates in both group.

All 110 patients were available for assessment at 1 month following surgery. The incidence of chronic groin pain, pain during coughing, pain during walking and cycling for 10 min were recorded. There was no significant difference in both groups. Table 3 shows results at 1 month.

All 110 patients were followed up at 6 months and assessed for various parameters. 5 patients in group A developed chronic groin pain at 6 months and 15 patients in group B developed chronic groin pain with p value of 0.01 (statistically significant). The incidence of pain during walking for 10 min was significantly lower in group A (2) compared to group B (8) with p value 0.04 (statistically significant). Also the incidence of pain while cycling for 10 min was significantly lower in group A (3) compared to group B (10) with p value 0.03 (statistically significant). No significant difference was seen in pain during normal daily activities. Table 4 shows results at 6 months.

Parameter	Group A (Prophylactic Neurectomy) n=55	Group B (Nerve Preserved) n=55	P Value
Incidence of chronic groin pain	5	15	0.01 (significant)
Pain at rest			
1. No pain	54	50	0.09
2. Mild pain	01	05	
Pain while coughing			
1. No Pain	54	49	0.11
2. Mild pain	01	06	
Pain during walking for 10 min			
1. No pain	53	47	0.04 (significant)
2. Mild Pain	02	08	
Pain during cycling for 10 min			
1. No pain	52	45	0.03 (significant)
2. Mild Pain	03	10	

Table 4. Result at 6 Months Follow Up

DISCUSSION

One of the common long term complication of open inguinal hernioplasty is chronic groin pain which may have an impact in patients quality of life.⁸ The study conducted by Ravichandran et al regarding advantage of prophylactic ilioinguinal neurectomy was underpowered and no definite conclusion was arrived. Following this various studies were conducted to compare prophylactic ilioinguinal neurectomy vs. nerve preservation but with varying result. In a study conducted by Dittrick et al wherein 156 patients were included in the study, reported a significant lower incidence of chronic groin pain in patients who had elective neurectomy when compared to control group at 6 months follow up.¹⁶

In another retrospective review of 191 patients who underwent elective neurectomy, none had chronic groin pain at 12 months follow up.¹⁷ In another study conducted by Crea and Pata where 97 patients were included in the study, it showed reduced intensity of groin pain in those who had elective neurectomy.²⁰ However in a recent randomised study involving 813 patients which was conducted by Picchio

et al reported similar incidence of chronic groin pain in both elective neurectomy and nerve preservation group.²¹ In our study, the mean age of group A and group B was 43.7 ± 6.43 and 42.8 ± 8.2 respectively. In a study by Nienhuijs et al, the mean age was 57.5 years.²²

The incidence of early post-operative complication in our study was 26 % of which haematoma was the most common complication of all. In a study conducted by Bittner et al, incidence of early post op complications was reported as 15 – 28 %.²³ Simons et al reported incidence of haematoma was around 16 % and wound infection was less than 5 %.²⁴ In our study at one month follow up, there was no significant difference between the two groups in incidence of chronic groin pain and pain during daily activities which complement the findings by Picchio et al.²¹ In our study at 6 months follow up, there was significantly lower incidence of chronic groin pain in elective neurectomy group (group A) compared to group B where the nerve was preserved ($p = 0.01$). There was also significantly lower incidence of groin pain in group A while walking and cyclin for 10 min compared to group B ($p = 0.04$ and 0.03). These findings were consistent with Dittrick et al.¹⁶

CONCLUSIONS

Prophylactic excision of ilioinguinal nerve definitely reduces the incidence of chronic groin pain following Lichtenstein tension free mesh repair compared to preservation of nerve during the same procedure.

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