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Effect of prophylactic ilioinguinal neurectomy on patients with elective unilateral Lichtenstein hernia repair: A prospective pain study

[1] Dr. Madan Mohan Mudgal, [*2] Dr. Naveen Kushwah, [3] Dr. Raghvendra Singh, [4] Dr. Manpreet Gill

[1] Associate Professor, Department of Surgery, GRMC & JAH, Gwalior, Madhya Pradesh, India

[2] Assistant Professor, Department of Surgery, GRMC & JAH, Gwalior, Madhya Pradesh, India

[3, 4] Resident, Department of Surgery, GRMC & JAH, Gwalior, Madhya Pradesh, India

[*] Corresponding Author: (Dr. Naveen Kushwah) Email: kushwah21@gmail.com

Abstract

Background: Pain is a prominent issue in inguinal hernia repair research as its persisting appearance is a severe complication.

Aims and Objective: To investigate the short to midterm effect of prophylactic ilioinguinal neurectomy on incidence of pain in inguinal region after Lichtenstein repair of inguinal hernia.

Materials and Methods: Eighty eight patients undergoing elective unilateral Lichtenstein hernia repair were studied in the Department of General Surgery, Gajra Raja Medical College and Jaya Arogya Group of Hospitals from July 2010 and June 2011 for incidence of chronic groin pain at 1 and 6 months after dividing them in to Group A (n=43) and Group B (n=45).

Results: Mean age of patients in Group A and Group B were 55.1±10 and 53.0±10 years respectively. Pain at rest, Pain after coughing 10 time, Pain after walking 10 stairs, Pain after cycling 10 minutes and Numbness was comparable between both the groups at baseline ($p>0.05$) and first month ($p>0.05$). At the end of 6th month Pain at rest, Pain after coughing 10 time and Numbness were comparable but significant difference was observed in Pain after walking 10 stairs (p-0.047) and Pain after cycling 10 minutes ($p=0.0198$) between both the groups.

Conclusion: Prophylactic excision of ilioinguinal nerve during Lichtenstein inguinal hernia repair decreases the incidence of exertional chronic groin pain after surgery.

Keywords: groin pain; hernia repair, numbness, ilioinguinal nerve

1. Introduction

Estimated risk of chronic pain after inguinal hernia repair is around 11% with a wide range of 0–43% [1]. Hernia repair involve dissection, use of foreign material and inflammation which causes injury to tissue (nociceptive pain) and to nerves (neuropathic pain) [2-4]. Nociceptive information transmitted to cerebral cortex can be modulated by patients' factors and medical and cognitive pain reducing interventions [5].

In Lichtenstein hernia repair encountered nerve mainly ilioinguinal nerve is preserved during surgery to minimize the incidence of chronic groin pain; however interference with the mesh placement can be seen with this procedure [6]. Hence, in order to reduce the incidence and intensity of persistent postoperative pain after hernia repair division of the ilioinguinal nerve prophylactically i.e. prophylactic ilioinguinal neurectomy has been practiced now days [7, 8].

Hence present study was performed to investigate the effect of prophylactic ilioinguinal neurectomy on incidence of pain in inguinal region after Lichtenstein repair of inguinal hernia in Indian population.

2. Materials and Methods

Present prospective study was done on 88 patients undergoing elective unilateral Lichtenstein hernia repair in the Department of General Surgery, Gajra Raja Medical College and Jaya Arogya Group of Hospitals, Gwalior between July 2010 and June 2011.

All patients having age between 18 and 80 years were considered eligible. Those with bilateral inguinal hernia, recurrent hernia, irreducible or strangulated hernia, large inguinal-scrotal hernia, history of previous abdominal incision, peripheral neuropathy, impaired cognitive function and limited mobility were excluded. Written informed consents for the study were obtained from all patients.

All the eligible patients for study during 6 month period were divided into Group A (n=43; prophylactic ilioinguinal neurectomy) and Group B (n=45; ilioinguinal nerve preservation). A total of 40 patients in each group were successfully followed up at 1 and 6 month. Rest of the patients was excluded from study.

Standard Lichtenstein tension-free mesh repair was the adopted procedure performed either under local anesthesia or spinal anesthesia at the discretion of individual patient. All operations were performed by the qualified surgeons of department allocated in a random manner. The primary outcome to measure was the incidence of chronic groin pain at 1 and 6 months. Secondary outcomes included incidence of groin numbness, postoperative sensory loss or change at the groin region at 1 and 6 month.

All baseline measurements were obtained before operation. Preoperative pain measurements after various activities (at rest, coughing for 10 times, walking up 3 flights of stairs and cycling for 10 minutes) were assessed by 4-point scale (none, mild, moderate, and severe) after completion of each task by patients. Preoperative incidence of groin numbness was also assessed by 4-point scale (none, mild, moderate, and severe) after completion of each task by patients.

Intraoperatively, once the ilioinguinal nerve was identified, patient was randomly allocated to either prophylactic ilioinguinal neurectomy (Group A) or ilioinguinal nerve preservation (Group B). The operative surgeon was asked to preserve or excise ilioinguinal nerve at time when nerve was identified on table during procedure. Up to that time he was blinded from treatment assignment. The patients were also blinded from the treatment assignment throughout and were followed up by one of the resident surgical officer of department who was not involved in the randomization process or the clinical management of the patient.

All patients received the standard flat mesh repair according to the technique described by Lichtenstein *et al*. During each follow up visit, pain at rest and upon completion of various activities (coughing for 10 times, walking up 3 flights of stairs, and cycling for 10 minutes) were assessed by 4-point scale (none, mild, moderate, or severe). All the follow up data was collected through a pre- approved questionnaire.

All the data were analyzed using IBM SPSS ver. 20 software. Comparisons were carried out by using statistic calculator by chi-square test where appropriate for categorical data and Student t test for parametric data. A 2-sided P value of less than 0.05 was considered significant.

3. Results

Mean age of patients in Group A and Group B were 55.1±10 and 53.0±10 years respectively. In Group A, 15, 15 and 10 patients had received primary, secondary and tertiary education whereas in Group B 16, 14 and 10 patients received primary, secondary and tertiary education. Most of the patients of both groups were operated under spinal anesthesia (35 in Group A and 36 in Group B).

Table 1: Showing different pain parameters between groups at Baseline, 1st month and 6th month follow ups

Parameters		Baseline		P	1st Month		P	6th Month		P
		Group A	Group B		Group A	Group B		Group A	Group B	
Pain at rest	Any Degree	5	4	NS	9	10	NS	1	5	NS
	None	35	36		31	30		39	35	
	Mild	5	4		6	7		1	5	
	Moderate	0	0		3	3		0	0	
	Severe	0	0		0	0		0	0	
Pain after coughing 10 time	Any Degree	6	5	NS	12	14	NS	2	8	NS
	None	34	35		28	26		38	32	
	Mild	4	4		8	9		2	5	
	Moderate	2	1		4	5		0	3	
	Severe	0	0		0	0		0	0	
Pain after walking 10 stairs	Any Degree	6	5	NS	12	14	NS	2	9	0.47
	None	34	35		28	26		38	31	
	Mild	4	4		8	8		2	5	
	Moderate	2	1		4	6		0	4	
	Severe	0	0		0	0		0	0	
Pain after cycling 10 minutes	Any Degree	8	6	NS	3	16	NS	3	12	0.0198
	None	32	34		27	24		37	28	
	Mild	5	3		6	7		2	6	
	Moderate	2	2		5	6		1	4	
	Severe	1	1		2	3		0	2	
Numbness	Any Degree	0	0	NS	8	4	NS	3	2	NS
	None	0	0		32	36		37	38	
	Mild	0	0		6	3		2	2	
	Moderate	0	0		2	1		1	0	
	Severe	0	0		0	0		0	0	

Data is expressed as number of patients

4. Discussion

Chronic pain is considered as a symptom but it is a disease state. It is defined as pain which lasts beyond the ordinary duration of time that an insult or injury to the body needs to heal. Reports have shown that it is usually thought of as four to six weeks, however some study have considered three months a centre point between acute and chronic pain [9].

In present study pain at rest, pain after coughing 10 time, pain after walking 10 stairs, pain after cycling 10 minutes and numbness were comparable at baseline and at the end of first month. At the end of 6th month pain at rest, pain after coughing 10 time and numbness were also comparable however, significant difference was observed in pain after walking 10 stairs and pain after cycling 10 minutes between both the groups. Joshi *et al*. studied 50 cases undergoing elective open mesh repair of inguinal hernia reported insignificant reduction in incidence of chronic groin pain after division of ilioinguinal nerve and also reported significant reduction in the intensity of the chronic pain especially during activities related to home and during self care [8]. Similar to

Joshi *et al*. in present study also pain after walking 10 stairs and pain after cycling 10 minutes were significantly different between the groups at the end of 6th months whereas other parameters were comparable at the end of 1st and 6th months.

A Danish hernia data base group report suggested that incidence of chronic pain et the end of 12 months after surgery was approximately 29% with 11% of patients complaining of severe pain [10]. Different case series have also reported incidence of chronic groin pain between 26-28% after 6 months of repair [7, 11]. The present study has reported reduction in the incidence of chronic pain after prophylactic ilioinguinal neurectomy compared to nerve preservation. However, this difference failed to show statistical significance probably because of the small sample size. Evidences further supports this findings that nerve preservation can lead to almost two folds increase in the incidence of chronic groin pain. Also pain severity in patients who had chronic pain after three months of surgery is significantly high when the ilioinguinal nerve is not excised. In present study incidence of chronic severe pain which require frequent follow up and regular use of analgesics was less in Group B compared to Group B which is in agreement to the study done by Kehlet *et al*. [12]

Trials investigating the influence of neurectomy and preservation of the nerve are conflicting. Ravichandran *et al*. [13] and Pichhio *et al*. [14] found no significant difference with respect to the incidence of chronic pain whereas study done by Bay-Nielsen *et al*. suggested a significant difference in favour of division [10].

Our randomized study revealed that the incidence of chronic groin pain during normal daily activities (eg. at rest and coughing for 10 minutes) was similar between the 2 groups which compliment the findings by Picchio *et al*. [14] However, in addition, we found fewer patients in the neurectomy group developed chronic groin pain upon exertion that was statically significant (cycling for 10 minutes and walking up 3 flights of stairs), which has not been previously studied. Study done by Amuthan *et al*. on 60 patients have also shown the similar results [15].

This study is not devoid of limitations. Small sample size is one of the major drawbacks of this study. No statistical sample size calculation was done prior to start of the study.

5. Conclusion

Though division of the ilioinguinal nerve does not reduce the incidence of chronic groin pain significantly as shown by statistical analysis, it has shown significant reduction in the intensity of the chronic pain especially during activities related to home and during self care. A larger study with longer follow up with objective mechanism to assess pain is recommended.

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