SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://saspjournals.com/sasjs/

OPEN ACCESS

A Comparative Study of Preservation Versus Elective Division of Ilioinguinal Nerve on Postoperative Groin Pain, in Lichtenstien Mesh Repair of Inguinal Hernia

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Original Research Article

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Article History
Received: 20.12.2018
Accepted: 01.01.2019
Published: 10.01.2019

DOI: 10.21276/sasjs.2019.5.1.2

Abstract: ***Background:*** Inguinal Hernia repair is one of the most commonly performed surgeries in the world. We have evolved gradually from the era of tissue repairs to the current era of prosthetic repairs. The surgeon today has the liberty to select from the wide variety of meshes which can be used to repair inguinal hernias. With low Incidence of recurrence after Lichtenstein Tension free Repair, major concern has been the Chronic Postoperative Groin Pain. ***Aim and Objectives:*** To evaluate the effect of preservation versus elective division of the Ilioinguinal nerve on chronic groin pain after Lichtenstein tension free inguinal hernia repair using a Polypropylene mesh. To evaluate other sensory symptoms Hypoesthesia, Numbness, Anaesthesia following hernia repair with mesh. ***Materials and Methods:*** This study is a prospective study of patients admitted in Karnataka Institute of Medical Sciences, Hubballi, from 26th November 2016 to 25th August 2017, with diagnosis of Primary Uncomplicated Inguinal Hernia. Comparison of Chronic groin Pain in patients undergoing Lichtenstein tension free mesh repair with respect to preservation (Group 2) or elective division (Group 1) of Ilioinguinal Nerve in 40 patients. All patients were followed up for 3 Months. ***Results:*** The incidence of postoperative groin pain in the present study compared Ilioinguinal nerve division versus Nerve preservation Mild pain was seen in 60% to 65% respectively, and moderate pain was seen in 30% patients in Nerve preservation group with no cases in Nerve Division group on post-operative day 1. At 1 month follow up Mild pain was seen in 15% to 70% respectively in both groups. Moderate pain was seen in 10% of patients of Nerve Preservation group, with no patients having moderate pain in Nerve Preservation Group. At 3 month follow up Mild pain was seen in 00% vs 55% in group 1 and group 2 respectively, Moderate pain, no patients in group 1 to 2.9% in group 2.Severe pain, no patients in group 1 to 2.9% in group 2. The incidence of postoperative Numbness, Anesthesia, Hypoesthesia of the inguinal region among Group 1 and Group 2 was statistically not significant. ***Conclusion:*** It is beneficiary to reduce the postoperative inguinodynia, and not much difference is observed in terms of other morbidities, hence it is wiser to recommend, routine Ilioinguinal neurectomy in patients undergoing inguinal hernia repair, when performing Lichtenstein tension free mesh repair for inguinal hernia.

Keywords: Inguinodynia, Ilioinguinal neurectomy, Lichtenstein tension free mesh repair, Post-operative chronic pain.

INTRODUCTION

Hernia may be defined as “An abnormal protrusion of an organ or tissue through a defect in the surrounding walls “[1]. The word "hernia" is a Latin term that means "rupture" of a portion of structure [1]. This word in Greek means “bud” [2]. Chronic post herniorrhaphy pain is defined as pain lasting > 3 months after surgery ,which is one of the most important complication occurring after inguinal hernia repair , occurs with greater frequency than previously thought .[3] Incidence of long term postoperative neuralgia reported with Lichtenstein repair of inguinal hernia range from 6-29 % [4,5]. 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 [6]. A review of studies

published between 1987 to 2000 showed an overall incidence of 25 % with 10% of patients having pain fitting a definition of moderate or severe pain [7]. In cases that involve workman's compensation issue, treating post-surgical patients becomes complicated. Although most legal cases result in out of the court settlement, worth noting is the fact that 5-7 % of patients with post herniorrhaphy neuralgia will sue their surgeons [8]. Routine Ilioinguinal nerve excision has been proposed as a means to avoid the troubling complication of long term postherniorrhaphy neuralgia [9,10].

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 nerve and greater auricular nerve are sacrificed respectively[11].

Theoretically excision of Ilioinguinal nerve would eliminate the possibility of inflammation neuralgia arising from entrapment, neuroma, fibrotic reactions .Yet controversies persist and the procedure is not widely accepted [12, 13].

The purpose of the current 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.

MATERIALS AND METHODS

The study is a prospective study of patients admitted in Karnataka Institute of Medical Sciences, Hubli, from Novomber 2016 to August 2017, with the diagnosis of primary uncomplicated inguinal hernia. Informed consent has been obtained from all the patients and the study protocol has been approved by the college ethics committee.

Inclusion Criteria

All Patients having Inguinal Hernia (Direct and Indirect) aged above 18 years.

Exclusion criteria

- Congenital Hernia.
- Recurrent Hernia.
- Complicated hernia like obstructed hernia, strangulated hernia.
- Non identification of Ilioinguinal Nerve
- Previous surgeries in the inguinal region.
- Patients with Preoperative Inguinal pain of other etiologies.

Study method

The study consists of two groups, with 20 patients in Neurectomy group and 20 patients in Nerve preservation group. A detailed history has been taken and a thorough examination was made and cases were studied as per the proforma attached. Routine blood investigations are done. Following this, patients were allocated into two groups based on lottery method. All surgeries were performed by different surgeons in the Department of General Surgery.

Post operative management

All the patients received 2 days of intravenous ceftriaxone 1 gm twice daily and Intramuscular Diclofenac 75 mg was given twice daily for analgesia and antiemetics were given if required. After two days patients were put on oral Cefexime 200mg twice daily if required and oral diclofenac tablets as and when required. All the patients were allowed liquids followed by semisolids 6 hours after surgery. Dressings are opened on third post-operative day and inspected for collections (seroma, hematoma) and any signs of infections.

Folllow up evaluation

Patient follow-up was performed with the same 4 point verbal-rank scale. The main endpoint of the study was evaluation of moderate to severe chronic pain at end of 3 months.

Period of follow-up being 3 months from the day of surgery, parameters used for comparison are

- Pain (using 4 point verbal scale , 0-none,1-mild,2-moderate,3-severe)
- Hypoesthesia (0-absent ,1-present)
- Numbness (0-absent ,1-present)
- Anaesthesia (0-absent, 1-present).

ASSESSMENT OF POST OPERATIVE PAIN AND OTHER PARAMETERS

Pain was graduated with a 4 point verbal-rank scale: none, mild, moderate, or severe. Mild pain was defined as occasional discomfort that did not limit daily activity, with a return to pre hernia lifestyle without the need for extra analgesics.

Moderate pain was defined as pain that interfered with return to normal everyday activities with extra analgesics rarely used.

Sever pain was defined as pain that incapacitated the patient, at frequent intervals, or interfered with everyday activities with frequent need for painkillers. Patients were asked to express agreement or disagreement on a 4-point verbal rank scale. Daily activity included both physical and sports activities such as walking, playing tennis or jogging.

The definition of the International Association for the study of pain regarding chronic pain (pain persisting beyond the normal tissue healing time, assumed to be three months) was used in this study.

Hypoesthesia

Abnormal partial loss of sensitivity to sensory stimuli; diminished

Numbness

Partial or total lack of sensation in a body part resulting from any factor that interrupts the transmission of impulses from the sensory nerve fibres.

Anaesthesia

Total loss of sensitivity to sensory stimuli

Statistical analysis

Data was entered into Microsoft Excel sheet and Statistical analysis was done using IBM SPSS Statistics 25.0 software. Significance was assessed at 5% level of significance.

RESULTS

For statistical analysis, all the patients were divided into two groups

- Cases or Neurectomy group (20 patients)- patients in whom Ilioinguinal nerve division was done.
- Controls or Nerve preservation group (20 patients)- patients in whom Ilioinguinal nerve was preserved.

In the study, all patients belonged to male gender and patients with age 18-30yrs were 17.5%, age 31-50yrs were 45%, age >50 were 37.5%.Right side inguinal hernia was noted in 65% of patients and 35% patients had Left inguinal hernia .Right Indirect inguinal hernia was seen in 52.5% ,Right Direct inguinal hernia in 12.5%, Right Pantaloons hernia in 2.5% , Left Indirect inguinal hernia in 20% and Left Direct Inguinal hernia in 12.5% .

Incidence of Chronic Groin pain

Table-1: Details of pain on follow up day-1 of study participants in each group

Pain severity	Group-1		Group-2		p value#
	n	%	n	%	
No pain	08	40	01	05	0.003*
Mild	12	60	13	65	
Moderate	0	00	06	30	

Note: # p value based on Fisher's exact Test, * statistically significant (p <0.05)

Table-2: Details of pain on follow up month-1 of study participants in each group

Pain severity	Group-1		Group-2		p value#
	n	%	n	%	
No pain	17	85	4	20	0.001*
Mild	3	15	14	70	
Moderate	0	0	2	10	

Note: # p value based on Fisher's exact test, * statistically significant (p <0.05)

Table-3: Details of pain on follow up month-3 of study participants in each group

Pain severity	Group-1		Group-2		p value#
	N	%	n	%	
No pain	20	100	07	35	0.001*
Mild	0	00	11	55	
Moderate	0	00	1	05	
Severe	0	00	1	05	

Note: # p value based on Fishers Exact test, * statistically significant (p <0.05)

Incidence of Numbness, Hypoesthesia, Anesthesia

No patients in the study developed numbness. 2 Patients (10%) in the group 1 had anesthesia of the inguinal region. And 1 patient (10%) had Hyposthesia of the inguinal region .No patients in group 2 developed Anesthesia or Hyposthesia.

DISCUSSION

Presently, tension-free mesh hernioplasty has become a gold standard procedure. Surgical intervention, i.e. neurectomy, is not a new invention to inguinal hernia repair procedures. Randomized studies have supported this evidence, e.g. Intercostobrachial nerve excision during axillary dissection. Division and removal of ilioinguinal nerve in the surgical field eliminates the possibility of postoperative neuralgia caused by the entrapment, inflammation, neuroma, or fibrotic reactions, and also avoids the complication of long-term neuralgia.

Prophylactic inguinal nerve excision markedly reduces the incidence of inguinal pain after inguinal hernia repair and should be included as a regular step in the surgical procedure. A lower incidence of groin numbness is found in the ilioinguinal neurectomy group after 3 months follow-up. Post-surgical inguinal pain is reduced by ilioinguinal nerve excision and can be used as a routine method.

So the present study was undertaken to evaluate the effect of Ilioinguinal nerve excision on postoperative groin Pain, Numbness, Anesthesia and Hypoesthesia .In the present study No. of patients were evaluated for pain ,numbness ,anesthesia , hypoesthesia are 40, in two study groups (Group 1 - 20 Patients and Group 2 -20 patients)

In group 1 Ilioinguinal nerve was identified and divided. In group 2 Ilioinguinal nerve was carefully protected throughout the operation, extreme care was taken during surgery to avoid inclusion of nerve during suturing and mesh placement.

The patients were followed up for assessment of pain, numbness,anesthesia,hypoesthesia at Postoperative day 1,at 1 month , and at 3 months after operation .

Comparison of results with other studies

Incidence of groin pain

The incidence of postoperative groin pain in the Ilioinguinal nerve division vs Ilioinguinal nerve preservation, showing the following results.

On postoperative day 1 No pain was seen in 08 patients (40%) and 1 patient (05%) in Group 1 and Group 2 respectively. Mild pain was seen in 12 patients (60%) and 13 patients (65%) in Group 1 and Group 2 respectively. Moderate pain was seen in 0 patient (00%) and 06 patients (30%) in Group 1 and Group 2 respectively. No Patient had severe pain.

Pain at 1 month follow up was analyzed and No pain was seen in 17 Patients (85%) and 4 Patients (20%) in Group 1 and 2 respectively .Mild Pain was seen in 3(15%) Patients and 14(70%) in Group 1 and Group 2 respectively. Moderate pain was not seen in the Group 1 patients, whereas group 2 had 2 (10%) patients with Moderate Pain. Severe pain was not noted in both the groups.

Pain at 3 Month Follow up was analysed , No pain was seen in all 20 (100%) and 07 (35%) patients in group 1 and group 2 respectively. Mild pain was seen in 0(00%) and 11 (55%) in group 1 and group 2 respectively .Moderate Pain was not seen in group 1 whereas 1 (05%) patient of group 2 had Moderate pain .Severe Pain was not seen in group 1 whereas 1 (05%) patient of group 2 had Severe pain.

However, this does not holds good with, Picchio and Colleagues suggest that nerve preservation and nerve division have similar incidence of pain and the intraoperative nerve division just leads to increases rate of wound anesthesia [13].

Pain was reported in 47.5 % vs 21.8 % respectively at 1 month comparable with study conducted by Dittrick (Dittrick M.D *et al*. [9], 32.5% vs 12.5% at 3 months correlates well with the study done by Fatemeh [15].

Incidence of numbness

Numbness was noted in any Patient from Group I and Group II at the end of three months.

Incidence of anesthesia

Anesthesia of the inguinal area was seen in 2(10%) Patients belonging to group 1 at the end of three months .No patient of group 2 developed anesthesias.

Which was markedly less compared to the study done by Picchio *et al*. [13], Dittrick *et al*. [9] and Ravichandran D *et al.* [10].

Incidence of hypoesthesia

Only 1 (05%) patient of Group 1 developed Hypoesthesia from post-operative day 1 and was consistent till the end of three months.

Results are not similar when compared with studies conducted by Mui, nerve preservation and nerve excision during surgery shows , 66% vs 55% after 1month , 42% vs 42% after 6 months respectively [14] and Fatemeh[15], nerve preservation and nerve excision during surgery shows ,90% vs 78% at POD-1, 24% vs 18% after 1 month respectively.

CONCLUSION

The treatment of inguinal hernias has been undergoing metamorphosis over the last 30 years. The techniques for surgical repair have been shifting from tissue and suture based repair to mesh based reinforcement of the hernia defect. There has been considerable time spent discussing the merits and demerits of laparoscopic repairs as compared with open mesh repairs. The research landscape has been shifting from the following recurrence rate to determining cost effectiveness, complication rates, rates of chronic pain and time to return to normal activity. It is becoming difficult to find common grounds among surgeons who are whetted to one repair technique or other with exclusion of other techniques .Some generalizations have become clear over the last 30 years .The Shouldice repair is the preferred tissue-based repair with regard to recurrence.

The Lichtenstein tension free hernia repair with mesh is an easy to learn, simple, and effective repair that can be mastered by clinicians and provide the recurrence and complication rates that are presented in the literature from speciality centers.

In the present study 40 patients who have completed the study period and follow up fully, this includes 20 patients in group 1 (Nerve Division) and 20 patients in group 2 (Nerve Preservation) who underwent Lichtenstein tension free mesh hernioplasty at KIMS Hospital, Hubli, Karnataka, India.

After completion of Data Collection and careful analyzing the data with appropriate statistical methods and observations, the excision of Ilioinguinal nerve compared to Identification and preservation of Ilioinguinal nerve during surgery and follow up of the study was done starting from postoperative day 1 ,at 1 month ,and at 3 months postoperatively. The present prospective comparative study revealed that , decreased incidence of chronic groin pain after surgery in Nerve Division group.

Furthermore the procedure is not significantly associated with additional morbidities like, Numbness which was not observed in any patient at the end of 3 month follow up.Anesthesia and Hypoesthesia was also not significant in both the groups.

However the sample size and the follow-up period in the current study are relatively short. A larger study sample and longer follow up may be needed before any further conclusion can be made.

Although the study sample and follow up period is short in the present study than the previous studies, it is still beneficiary to reduce the postoperative Inguinodynia, and not much difference is observed in terms of other morbidities.

Hence it is wiser to recommend, routine Ilioinguinal neurectomy in patients undergoing inguinal hernia repair, when performing Lichtenstein tension free mesh repair of inguinal hernia.

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