COMPARISION OF POST OPERATIVE CHRONIC PAIN AFTER EXCISION OF ILIOINGUINAL NERVE IN LICHTENSTEIN'S HERNIOPLASTY

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ABSTRACT

Objective: To provide a comparative analysis of mean post-operative pain score after preservation and elective excision of ilioinguinal nerve (IIN) using standard Lichtenstein hernia repair (LHR) technique.
Study Design: Randomized controlled trial.
Place and Duration of Study: Department of Surgery Combined Military Hospital (CMH) Rawalpindi/ Peshawar, from 15 May 2013 to 15 May 2014.
Materials and Methods: One hundred and fifty patients with diagnosis of inguinal hernia satisfying inclusion/exclusion criteria were included. Patients were divided into two groups randomly. In group A, IIN was carefully protected while excision were done in group B. Demographic as well as data concerning groin pain at 03 months post operatively were collected and analyzed using SPSS.
Results: A total of 150 patients were included. Mean age in group A was 37.32 ± 10.45 years while in group B was 36.56 ± 10.26 years (p=0.653). Majority of the patients in both groups were male {group A 89.33% (67), 92% (69) in group-B}, while female constituted only minority {8 (10.67%) in group A and 6 (8%) group-B}, the difference being statistically insignificant (p=0.571). Majority of the patients had indirect hernia and mean operation time was similar in both groups. Mean postoperative pain score was 3.76 ± 1.11 and 2.82 ± 0.677 in group A and B respectively, the difference being statistically significant (p<0.001).
Conclusion: Mean post-operative pain score is higher in preservation techniques compared to elective excision of IIN for the treatment of inguinal hernia.

Keywords: Inguinal hernia, Ilioinguinal nerve, Lichtenstein hernioplasty, Post-operative pain.

INTRODUCTION

Hernia has plagued humans throughout recorded history and descriptions of hernia reduction date back to Hammurabi of Babylon and the Egyptian Papyrus[1]. Inguinal hernia is one of the most common diseases worldwide with an incidence rate of 18-24% throughout life[2]. Inguinal hernia repair is the most common operation undertaken with more than 100,000 inguinal hernia repairs performed in UK per year. Lichtenstein Hernia Repair (LHR) is the gold standard procedure employed for 70% of hernias. Though LHR is a safe procedure but complications do occur. Postoperative chronic groin pain (PCP), defined as pain arising at or beyond 3 months after inguinal hernia repair, is the most debilitating long term complication badly effecting patient's satisfaction and quality of life after operation[3]. PCP is characterized by variegated symptomatology. Prevalence rates vary substantially among studies, ranging between 0% and 62.9%, with 10% of patients fitting in the moderate to severe pain that significantly affects quality of life disabling the individual's ability to participate in work and social activities. PCP also contributes to erectile dysfunction and dysejaculation compromising sexual life of the individual[4].

The exact cause of inguinodynia is still unclear and various etiologies have been

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suggested, major being neuropathic and non-neuropathic. The most notorious cause is neuropathy due to inadvertent perioperative nerve damage (partial division, crushing, diathermy burns, neurolysis and suture/ staple or mesh entrapment). The non-neuropathic causes are periosteal reaction, perineural fibrosis, mechanical pressure due to mesh-related fibrosis and visceral pain (encountered on ejaculation)[5]. The three nerves potentially involved are the IIN, iliohypogastric nerve (IHN) and genital branch of the genitofemoral nerve (GFN). The IIN is the most at risk as it lies immediately beneath the divided external oblique fascia[2,6].

This debilitating condition poses challenging situation for clinicians and best treatment involves avoiding the problem. Traditional teaching recommends preservation of IIN to prevent associated morbidity. However elective neurectomies have been utilized as mode to reduce incidence of PCP[2,5]. The concept of routine neurectomy in surgery is not unique to inguinal hernia as it is commonly employed in axillary dissection. Elective division does not appear to be associated with a significant increase in postoperative symptoms rather it helps reduce sexual dysfunction[7]. However, RCTs comparing deliberate IIN excision vs preservation have shown conflicting results and value of neurectomies remains controversial[8,9]. Lichtenstein and his successor Amid recommend preservation of IIN, whereas Wantz recommends intentional severance based on the concept of 'no nerve, no pain'[10].

The aim of current study was to evaluate the influence of perioperative IIN identification and subsequent excision or preservation on the mean PCP score using standard LHR technique, so that best procedure out of the two should be employed in future to reduce postoperative pain.

MATERIAL AND METHODS

This randomized prospective double blind control trail was conducted at department of surgery CMH Rawalpindi/ Peshawar from May 2013 to May 2014. Non probability consecutive sampling technique was followed and one hundred and fifty patients received through OPD with diagnosis of inguinal hernia were included. Inclusion criteria were adults of both genders older than 18 years of age having unilateral inguinal hernia (diagnosed clinically). Exclusion criteria were bilateral, recurrent, irreducible, obstructed or strangulated inguinal hernia, peripheral neuropathy, previous abdominal incision and history of impaired cognitive functions. Random allocation software 10.0 was used to divide patients into two groups having 75 patients each. Patients in both groups underwent standard LHR under spinal anesthesia. In group A, IIN was carefully protected while in group B it was excised. Hernioplasties were performed by

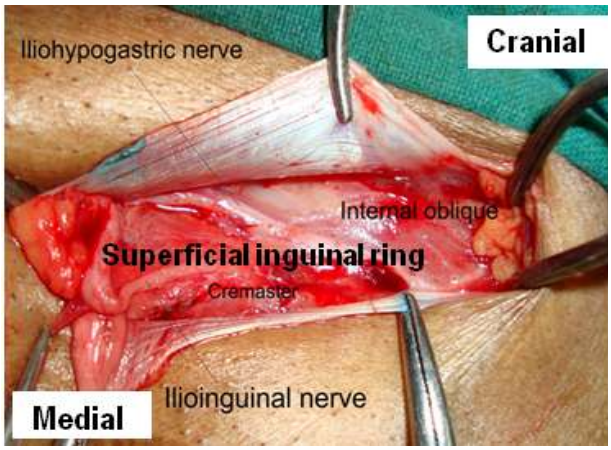

Figure: Exposure of inguinal canal showing IIN and IHN and their relation to fasciae of inguinal canal.

the same surgical team. The surgeon preserved or excised the nerve according to patient number and the randomization table (double blind). This was not written on the surgery report but could be determined later from randomization table using patient number. The patient and the person who completed the forms did not know to which group the patient belonged (nerve excision or preservation).

A detailed explanation was given to patients about participation in the study and written consent obtained. Visual analogue scale (VAS), an acceptable scale with good reliability and validity[4], was used to ratify pain and patients

were informed in detail about how to score pain. Pain severity was assessed 3 months post-surgery by colleagues totally unaware of the group to which patient belonged.

All repairs were performed by the same surgical team using an open tension-free mesh technique as described by Lichtenstein et al[11]. Under spinal anesthesia, a suprainguinal skin crease incision was made. Spermatic cord lifted, hernial sac dissected and dealt according to type of hernia leaving entire floor and posterior wall exposed for placement of 6x11 cm proline® mesh. The mesh was placed with its medial edge 1-2 cm medial to pubic tubercle and fixed with proline 2/0 suture (figure). In group B, the IIN was cut sharply with a blade 1 to 2 cm lateral to the deep inguinal ring. Neither electro cautery nor suture material was used in cutting the nerve. Direct pressure was applied to control bleeding when required. The cut ends were left alone without implantation into muscle. A single dose of intravenous antibiotic was administered 03 hours before surgery in all cases. Mobilization was advised 4-6 hours after surgery and patients received regular analgesia for two days postoperatively.

Data was collected on proforma which included age, gender, type of hernia, type of surgery conducted, mean operative time and pain score. Data was fed and analyzed on SPSS version 21.0. Descriptive statistics were calculated for both qualitative and quantitative variables. Mean and standard deviations were calculated for quantitative data like age and pain while frequencies and percentages were calculated for qualitative data like gender. Independent sample t-test was used to compare pain score in both groups while chi square test used for qualitative variables like gender. A *p*-value less than 0.05 was considered significant.

RESULTS

One hundred and fifty patients included in the study were randomized into two groups. In group A, IIN was carefully protected while in group B it was excised. Mean age in group A was 37.32 ± 10.45 years while in group B was 36.56 ± 10.26 years (p=0.653). Majority of the patients in both groups were male {group A, 89.33% (67) and 92% (69) in group-B} while female constituted only minority {8 (10.67%) in group A, 6 (8%) in group-B}, the difference being statistically insignificant (p=0.571). Indirect hernia was mainly found in both groups (p=0.374). The operating time in cases of both groups was similar (table-I).

Table-I: Data of demographic variables of patient (n=150) undergoing either IIN preservation (group A) or excision (group B) using standard LHR technique.

S.No	Group A (n=75)	Group B (n=75)	*p*-value
Age in years (Mean ± SD)	37.32 ± 10.45	36.56 ± 10.26	0.653
Sex ratio M:F	8.4:1	11.5:1	0.571
Mean Operation Time (minutes)	40.17 ± 7.25	41.80 ± 7.74	0.185
Type of Hernia Indirect Direct	 50 (67%) 25 (33%)	 55 (73.33%) 20 (26.67%)	 0.374

Table-II: Comparison of mean pain score in both groups (n=150).

Group-A (n=75)	Group-B (n=75)	*p*-value
3.76 ± 1.11	2.82 ± 0.677	<0.001

Mean postoperative pain score was 3.76 ± 1.11 and 2.82 ± 0.677 in group A and B respectively, the difference being statistically significant (table-II).

DISCUSSION

LHR is safe, effective gold standard procedure with smooth learning curve and low recurrence rate[12]. PCP is the most debilitating long term complication badly jeopardizing patient's work, social and sexual life[13]. Although

only 2%-4% of the patients are adversely affected, this is significant, considering the volume of the operations performed worldwide[14]. One of the options proposed is elective IIN excision although conflicting results encompass its effectivity[2,15]. The current study was planned with a view that there is no consensus on whether or not to identify and subsequently divide or preserve the IIN, during surgery. This study evaluates the influence of perioperative IIN identification and subsequent excision or preservation on the mean PCP score, so that best procedure out of the two may be employed in future to reduce postoperative pain.

In our study, mean age in group A was 37.32 ± 10.45 years while in group B was 36.56 ± 10.26 years (p=0.653). Majority of the patients in both groups were male while only minority consisted of female (p=0.571). The operating time in cases of both groups was similar. Mean time in group A was 40.17 ± 7.25 minutes while in group B it was 41.80 ± 7.74 minutes, which wan not statistically significant (p=0.185). Mean postoperative pain score was 3.76 ± 1.11 and 2.82 ± 0.677 in group A and B respectively, the difference being statistically significant (p<0.001). The findings of the current study with regards to postoperative pain score are consistent with studies conducted worldwide[5,10,16-18]. In a study on relationship between nerve management and PCP, wide resection of IIN was associated with significant reduction in chronic pain[5]. Our findings are also consistent with a study that revealed significantly lower pain severity scores on VAS in nerve excision group than control group (nerve preservation) at 3 month postoperatively (2.4 ± 0.05 vs 3.9 ± 0.9) p-value 0.001)[11]. Caliskan et al[19] also reported similar results while a meta-analysis carried out by Johner A etal. concluded that IIN resection prevents chronic pain after LHR[10].

Another local study by Mirza et al[20] was conducted without comparing it with elective excision of IIN and reported incidence of 6% of the patients with PCP at six months. Malekpour et al[21] and Dittrick et al[22] assessed the mean severity pain scores at different time interval (1st postoperative day, 1 month, 6 months, 1 year and 3 years), yet their results were in accordance with our results and both reported significant decrease in pain scores among nerve excision group compared to the nerve preservation group.

Limitation of the current study is small sample size, shorter follow up period and subjective evaluation of pain.

CONCLUSION

Inguinal hernia is a sure met disease with LHR being gold standard of management. PCP is the most debilitating long term complication with grave consequences. IIN excision decreases PCP and it may be used as a routine method. The procedure is safe and easy to perform during open mesh repairs.

Although this study recommends the use of IIN excision, further studies at larger scale incorporating multiple centers are required to exactly delineate its effectiveness.

Disclosure

This is a Dissertation based article.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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