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ORIGINAL ARTICLE

Post-operative Pain after Lichtenstein Inguinal Hernia Repair

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ABSTRACT

Background: Although advanced techniques have been adopted in inguinal hernia repair parallel to those in developing medical technologies, currently no consensus has been reached on the best method among all existing methods. Post-operative pain is the main reason for longer hospital stay, repeated visits in out-patient department (opd) and delay in return to daily routine work.

Objective: To compare the mean post-operative pain of Lichtenstein procedure with and without mesh fixation for inguinal hernia repair

Methodology: This randomized control trial was conducted for 6 months in Benazir Bhutto Hospital, Rawalpindi. Patients were divided into two groups, Group-A included those managed without mesh fixation and Group-B who had mesh fixation. All the patients were assessed for postoperative pain at 24 hours by visual analogue scale (VAS).

Results: In our study, comparison of mean post-operative pain score in both groups shows 3.23+0.77 in Group-A and 3.98+0.76 in Group-B, p value was 0.0001.

Conclusion: We concluded that post-operative pain is less in patients managed by Lichtenstein repair without mesh fixation as compare to patients managed with mesh fixation

Keywords: Inguinal hernia, Lichtenstein procedure, mesh fixation, post-operative pain.

INTRODUCTION

Hernias are protrusions of all or part of an organ through the body wall that normally contains it. Groin hernias include inguinal (96%) and femoral (4%) hernias, and are often symptomatic with discomfort. They are extremely common, with an estimated lifetime risk in men of 27%[1]. Worldwide, more than 20 million patients undergo groin hernia repair annually. Based on the new international guidelines for groin hernia management, there is no one surgical technique that is suited to all patient characteristics and diagnostic findings. Therefore, a tailored approach should be used[2].

Hernia repair has long been regarded as an "index" procedure in the early stages of surgical training, and competence in open and laparoscopic hernia repair is viewed by many surgical trainees as a milestone in their careers. While many other surgical procedures are increasingly done laparoscopically, open hernia repair continues to be commonly performed[3].

It has been reported that the complications of mesh hernia repair are infection, pain, adhesions, seroma, intestinal obstruction, and recurrence[4]. Evidence shows that it is uncertain whether antibiotic prophylaxis reduces the risk of postoperative wound infections after surgery. Evidence of moderate quality shows that antibiotic prophylaxis probably makes little or no difference in preventing wound infections[5].

Inguinodynia or chronic post-herniorrhaphy pain, defined as pain lasting longer than 3 months after open inguinal hernia repair, has become the most important complication after inguinal surgery and therefore compromises the patient´s quality of life[6]. Nerve identification make a significant reduction of the pain and a trend in favour of neurectomy group was reported[7].

An ideal mesh can be used in any type of hernia. Five important key points like biocompatibility, risk of infection, handling convenience, socioeconomic, and longevity are extremely important while considering the quality of mesh[8]. The properties of a mesh are important because it affects the degree of fibrotic reaction, chronic pain, stiffness, and other postoperative outcomes. The mechanical properties (tensile strength and elasticity), pore size, weight of mesh, biocompatibility/reactivity of the mesh in the hernia microenvironment, constitution, and shrinkage all affect how the mesh will be reinforced in the tissue during the healing process[8,9].

It is important in the healing process for a hernia mesh to mimic the tension and elasticity of the abdominal wall. The tension of the abdominal wall is calculated using the "Laplace Law". The law states that in an elastic spherical vessel, in this case, the abdomen, tension, pressure, wall thickness, and diameter are related with the formula

$$tension = (diameter \times pressure)$$
$$4 \times wall\ thicknes$$

The maximum intra-abdominal pressure is approximately 170 mmHg, caused by coughing and jumping. Heavy weight polypropylene (PP) meshes could withstand 10 times this pressure. However, after implantation, the natural elasticity is reduced because the resistance of the mesh is not compatible with the host tissue[10,11].

Keeping in mind that hernia repair is one of the commonest operation done in surgical practice with variable results, rationale of this study is to compare one variable, which is post-operative pain in two different approaches.

MATERIAL & METHODS

This randomized control trial was conducted in Benazir Bhutto Shaheed Hospital from 21st September 2020 to 21st March 2021. Patients were included by consecutive (Non-probability) sampling. Sample size was 80, each group contain 40 patients and calculated as level of confidence (a) = 5%, power of study (1-B) = 80%, mean pain score (without mesh fixation group) = 5.68 ± 2.06 & mean pain score (mesh thud= group)= 3.88+1.78. All the patients of both sex between the ages of 20 to 60 years with inguinal hernia were included in the study. Patients with bilateral inguinal hernia, recurrent hernia, unfit for surgery, pain >3 months, severely Immune-compromised or previous history of chemotherapy or radiotherapy, H/O Diabetes Mellitus, Ischemic Heart Disease, Chronic Renal Failure, Chronic Liver Disease or not giving consent were excluded from the study. Written permission were taken from IRB. Sample size was calculated by WHO formula.

All surgical procedure was done under spinal anaesthesia. The patients were randomly allotted to each group by lottery

method. In group-A, mesh was not fixed while in Group-B, the synthetic mesh was fixed around the spermatic cord at the border of the deep ring, inguinal ligament and conjoint tendon with polypropylene 2-0. The level of competency of the surgery was qualified consultant surgeon having >2 years.

After the completion of the surgery, the patients were shifted into the surgical wards and standard post-operative care was given to all the patients. All patients were given 3 doses of Inj. Kertorolac 30mg IV. All the patients were assessed for postoperative pain at 24 hours by visual analogue scale (VAS). Data was recorded on the specifically designed performa attached as Annexure-A. The data was entered in SPSS 25. Mean and standard deviation was calculated for quantitative data like age of the patients, VAS (pain score) of the patients in both groups. Frequency and percentages were calculated for analysis of qualitative data like gender, side of the inguinal hernia. Student t-test was applied to compare mean pain score between both groups. Stratification was done for age, gender, duration of hernia. Post stratification student t test was applied to compare the mean of both groups. P <0.05 was considered as significant.

RESULTS

Age distribution shows that 43 were between 20-40 years of age (table 1). Also 74 out of 80 patients were males.

Table 1: showing age distribution.

Age (in years)	Group-A (n=40)		Group-B (n=40)	
	No. of patients	%	No. of patients	%
20-40	24	60	19	47.5
41-60	16	40	21	52.5
Total	40	100	40	100
Mean+SD	39.83+7.90		41.80+8.13	

Comparison of mean post-operative pain score in both groups shows 3.23+0.77 in Group-A and 3.98+0.76 in Group-B, p value was 0.0001 as shown in table 2.

Table 2: showing comparison of mean post-operative pain score. (n=80)

VAS	Group-A (n=40)		Group-B (n=40)	
	Mean	SD	Mean	SD
	3.23	0.77	3.98	0.76

P value=0.0001

39 patients presented the hospital within one month of onset of swelling while 41 took more time to take advice from specialist surgeon. On VAS after surgery, patients who present earlier had less pain and P value of .001 while those who presented late complaint of much more pain and their P value was calculated as .0001

Table 3: showing stratification for side of hernia with regards to pain on VAS

VAS	Group-A(n=20)		Group-B(n=20)		P value
	Mean	SD	Mean	SD	
RIH	3.11	0.81	3.90	0.68	0.001
VAS	Group-A(n=20)		Group-B(n=20)		
LIH	3.32	0.60	4.04	0.81	0.0001

DISCUSSION

In our study, mean age was calculated as 39.83+7.90 years in Group-A and 41.80+8.13 years in Group-B, 82.5%(n=33) in Group-A and 77.5%(n=31) in Group-B were male whereas 17.5%(n=7) in Group-A and 22.5%(n=9) in Group-B were females, comparison of mean post-operative pain score in both groups shows 3.23+0.77 in Group-A and 3.98+0.76 in Group-B, p value was 0.0001.

In one study[12], mean pain score was 5.88+2.06 and 3.88+11.78 respectively in without mesh fixation and mesh fixation group.

In another study[13], mean pain score was 6.5 and 5.1 respectively in mesh fixation group and without mesh fixation group. This study compared the suture less hernioplasty with Lichtenstein repair. They reported that average visual analogue scale (VAS) pain scores were significantly lower in suture less hernioplasty than in Lichtenstein hernioplasty[14]. Lionetti R and others reveal (2.2±1.0 vs. 4.0+1.1)[15]. Other researchers reported earlier that pain with suture less technique was 2.5±1.7 while with Lichtenstein was 3.2+1.8.[15]

Robert Beaumont Wilson[16] compared Lichtenstein procedure with and without Mesh-Fixation for Inguinal Hernia Repair and recorded that operative time and pain scores in the nonfixation group were significantly lower, without any increase in rates of recurrence. Postoperative pain was found to be significantly less in the study group, which is one of the most important factors affecting postoperative life quality[17,18,19].

Indifference between the groups in terms of hospital stay, postoperative complications, and recurrence rates indicates the safety of the procedure. It was concluded that in Lichtenstein hernia repair method, non-fixation technique can be used safely with better results[20,21,22].

Another recent study[23] found out the mesh fixation technique that minimises chronic pain in Lichtenstein hernioplasty, they performed Lichtenstein hernioplasty under local anaesthesia on 625 patients in day care units. The patients were randomised to receive either a cyanoacrylate glue (n = 216), self-gripping mesh (n = 202) or non-absorbable 3–0 polypropylene sutures (n = 216) for the fixation of mesh. A standardised telephone interview or postal questionnaire was conducted 5 years after the index operation. The patients with complaints suggesting recurrence or chronic pain (visual analogue scale ≥ 3, 0–10) were examined clinically. The rate of occasional pain, chronic severe pain, recurrence, re-operations, daily use of analgesics, overall patient satisfaction and sensation of a foreign object were recorded. A total of 82% of patients (n = 514) completed the 5-year audit including 177, 167 and 170 patients in the glue, self-fixation and suture groups, respectively. There were no significant differences in the incidence of pain (7–8%), operated recurrences (2–4%), overall re-operations (4–5%), need for analgesics (1–2%), patient's satisfaction (93–97%) or in the feeling of a foreign object (11–18%) between the study groups. It was concluded that the choice of the mesh or fixation method had no effect on the overall long-term outcome, pain or recurrence of hernia. Less penetrating fixation (glue or self-gripping mesh) is a safe option for the fixation of mesh in Lichtenstein hernia repair[24,25].

Considering the results of our study and other studies, the hypothesis that "frequency of post-operative pain is less in patients managed by Lichenstein repair without mesh fixation as compare to patients managed with mesh fixation" is justified. However, we are of the view that further local and multicenter trials are required to validate our results.

CONCLUSION

In the light of results of this study, It was concluded that post-operative pain is less in patients managed by Lichenstein repair without mesh fixation.

Conflict of interest: No
conflict of interest present

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