ORIGINAL ARTICLE

Post-Operative Complications of Laparoscopic Vs Open Inguinal Hernioplasty

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ABSTRACT

Background: In our most surgical setups, repair of inguinal hernia is the most common elective surgery performed and Lichtenstein mesh repair is commonly performed. Post operatively patients most commonly complain of groin pain and discomfort and remain unsatisfied.
Aim: To compare the total extra peritoneal mesh repair with the Lichtenstein mesh repair in terms of frequency of postoperative pain.
Study Design RCT.
Setting and study duration: 20th Nov. 2017 to 19th May 2018. Dept of Surgery, Holy Family Hospital, Rawalpindi
Methods: A total of 100 patients with reducible inguino-scrotal hernia, 20 to 70 years of age were included. Patients with irreducible hernia and recurrent hernia were excluded. Patients were randomly divided into 2 groups i.e. Patients underwent (Lichtenstein mesh repair) were designated as Group-A & patient who underwent (total extra peritoneal mesh repair) were designated as Group-B, by using lottery method. Patient was kept in the ward for 24 hour to observe the postoperative pain assessed by visual analogue scale.
Results: Average age of patients in group A was 44.98 ± 12.41 years and in group B was 42.78 ± 12.99 years. The most frequent age group in this study was 20-46 years in which 55 (55.0%) patients were present . Post-operative pain was found in 39 (78.0%) patients in group A (Lichtenstein repair) while in group B (TEP repair), it was found in 29 (56.0%) patients with p-value of 0.032.
Conclusion: This study concluded that total extra peritoneal mesh repair results are better in terms of (less postoperative pain as that of Lichtenstein mesh repair.
Keywords: Hernia, Inguinal, Lichtenstein, Mesh Repair, Pain, Postoperative

INTRODUCTION

In Latin the word hernia means tear apart of a portion of a structure[1]. Definition of surgical abdominal wall hernia is protrusion of the content of the abdominal cavity which may be a viscus or part of a viscus through a weak point in the wall[2].

This type of hernia is very common among males Lifetime risk among male and females is reported to be 27% and 3%[1]. Inguinal hernia can be further divided into two categories. i.e., direct and indirect, this classification is based on their attachment to the inferior epigastric vessels. Direct inguinal hernias occur medial to the inferior epigastric vessels while Indirect inguinal hernias occur when abdominal contents protrude through the deep inguinal ring, lateral to the inferior epigastric vessels[3].

It is reported that among male and females development of groin hernia in their life is about 27% and 3%.[4] Mostly groin hernias occurs at the age of 1 year and after the age of 50 years.[5] Very high mortality was reported due to different types of hernias (Inguinal, abdominal and femoral) was 51,000 deaths in the year 2013 and 55,000 deaths in the year 1990[6].

Smoking, COPD, BMI>30, Pregnancy, collagen vascular disease, peritoneal dialysis and previous history of open appendectomy are the recognized risk factors for the development of hernia[4,5]. Hernias are partly genetic and occur more often in certain families. It is not clear till now that there is relationship between inguinal hernias and heavy lifting. Often hernias diagnosis is based on signs and symptoms. For the confirmation of hernia diagnosis or to rule out other possible causes medical imaging is used occasionally[4].

Among abdominal wall hernias inguinal hernia is one of the most frequent types and repair of the inguinal hernia is one of the most common types of elective surgery performed by the surgeons.[7-9] There are different techniques which can be adopted for the repair of inguinal hernia including open surgical technique or by minimally invasive laparoscopic approach with merits and de merits of each technique.

Basic principle of either approach is the tension free reinforcement of the posterior inguinal wall[7]. Posterior inguinal wall reinforcement can be done by open surgery techniques listing from Darns repair, Bassini repair, Shouldice repair to mesh repair known as Lichtenstein repair. With the advent of minimal invasive techniques, Total Extra peritoneal and Total Abdominal Preperitoneal mesh repair were introduced and became popular. TEP uses preperitoneal space as a working space to dissect sac and placement of mesh. Lichtenstein repair can be done

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using prosthetic polypropylene mesh which is fixed by polypropylene sutures or by applying self-adhesive mesh to the posterior wall thereby strengthening it[8].

Post operatively both hernia repair techniques can have different complications including headache, post-operative pain, seroma formation, surgical site infection and recurrence[1].

Both techniques have been compared and analyzed tremendously and yet superiority of any technique could not be established. TEP has a lengthy learning curve but produce better results in terms of post-surgery pain and early recovery to work as compared to Lichtenstein mesh repair. Recent literature reports high recurrence rate in TEP.

In our most surgical setups, inguinal hernia repair is the most common elective surgery performed and Lichtenstein mesh repair is commonly performed. Post operatively patients most commonly complain of groin pain and discomfort and remain unsatisfied. Studies conducted in Pakistan as well as internationally report TEP resulting in significantly less postoperative pain and discomfort 50% as compared to 80% at 1 week and 24 % as compared to 70% at 1 month[9]. This postoperative pain in main cause of delay in return to daily activities and not being able to return to work adds on to the economic burden of developing countries like Pakistan. In another study, 66.3% patients in TEP and 88.3% patients in Lichtenstein repair had pain.[7]

The objective of the study was to compare postoperative pain in patients undergoing total extraperitoneal mesh repair and lichenstein mesh repair.

METHODS

This RCT was conducted at Department of General Surgery, Surgical Unit II Holy Family Hospital, Rawalpindi during time period 20th November 2017 to 19th May 2018.

Sample Size: Sample size calculation was based on the following parameters: Sample size of 100 patients was calculated by using 5% level of significance, power of test as 80% and anticipated population proportion as 66.6%[7] and 88.3%[7]. Sample size (n): approximately 50 patients, total of 100 "Group-A": TEP Mesh Repair = 50 Group B: Lichtenstein technique=50. Consecutive sampling (Non-probability) technique was used for sample selection. Male patients of age 20-70 years, presenting with direct and indirect inguinal hernia were included in the study. Following patients were excluded from the study i.e. Irreducible, obstructed or strangulated inguinal hernia, Recurrent inguinal hernia, ASA class 3 and more.

Data Collection Procedure: Total 100 patients (50 in each group) were in the study. There patients were admitted in department of surgery with diagnosis of inguinal hernia as per inclusion and exclusion criteria. All patients were explained about the procedure and an informed written consent was taken. Lottery method was used to divide the patients in 2 groups. i.e. Group-A and B. Patients in Group-A were operated upon by open technique under spinal anesthesia. Open approach to the inguinal canal was made by suprainguinal skin crease incision. In case of indirect hernia, hernial sac was separated from spermatic cord and herniotomy was done. In case of direct inguinal hernia, plication of the sac with vicryl 2/0 was done. In both direct and indirect inguinal hernia posterior wall was strengthened by placing polypropylene mesh and securing it with prolene 2/0. External oblique apponeurosis was closed by vicyl 1. Skin was closed by prolene 2/0 in interrupted fashion. In laparoscopic hernia repair both TEP (Total extra peritoneal) approach was used. In TEP (Total extraperitoneal) approach, space was created below abdominal muscles and peritoneal cavity was spared. Mesh was inserted after reduction of hernia defect. All the patients were received antibiotic 1st generation cephalosporin (cephradine) 500 mg intravenously single dose preoperatively. Post operatively one dose of injection paracetamol infusion was given to all patients. Patient was kept in the ward for 24 hour to observe the postoperative pain assessed by visual analogue scale. Patient was followed up in OPD and pain in groin was assessed by VAS on 7th day postoperative. Stitches were removed at 7th day postoperatively. Data was entered in the preformed Proforma (annexed) for analysis.

Analysis Plan: SPSS version 16 was used for data entry and analysis. Quantitative variables (Age) were presented with the help of mean±SD. Frequency and percentage was used for qualitative variables such as [ASA, BMI, Type of hernia and post-operative pain (Presence/Absence)]. Comparison of postoperative pain in both groups was carried out with the help of Chi Square test. Criteria for significance was set as p-value $\leq$0.05. Stratification was done to control effect modification for the following variables (Age, BMI, ASA and hernia type). Post stratification chi square test was applied to see the effect of these variables on postoperative pain in both treatment groups. p-value significance criteria was set as $\leq$0.05

RESULTS

Mean age of all 100 patients in this study was 43.88±12.69 years. In Group-A and in Group-B mean age of patients was 44.98±12.41 years and 42.78±12.99 years. Majority of the patients 55(55.0%) were between 20 to 46 years of age. Distribution of patients according to ASA status showed that 44% patients ASA status was I and 56% patients ASA status was II. Mean BMI of patients was 29.30±2.64 (Group-A) and 29.0±2.27 (Group-A) respectively. (Table-1) Post-operative pain was found in 39(78.0%) patients in (lichenstein repair) while in (TEP repair), it was found in 29 (56.0%) patients with p-value was 0.032 which shows that significantly higher number patients had pain in Group-A as that of patients in Group-B. (Figure-1) Stratification of post-operative pain with respect to age groups, BMI, ASA status and type of hernia is shown in Table-2. (Table-2)

Table-1: Characteristics of patients in study groups

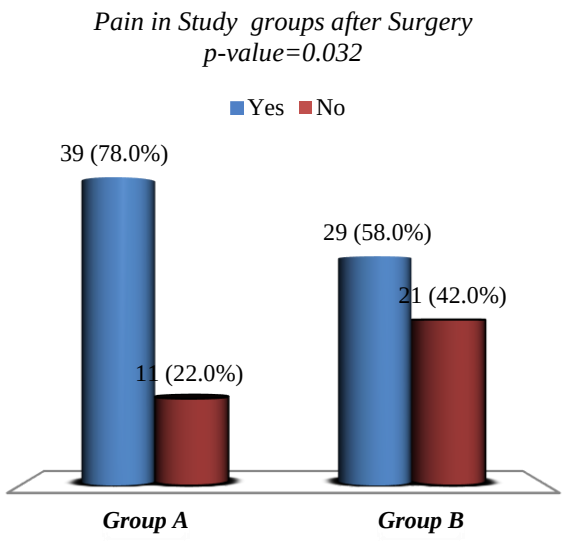
	Group A	**Group B**
n	*50*	*50*
Age in years	44.98 ± 12.41	42.78 ± 12.99
20-45 Years	28(56%)	27(54%)
46-70 Years	22(44%)	23(45%)
BMI(Kg/m2)	29.30 ± 2.64	29.0 ± 2.27
ASA-Status (I/II)	ASA-I:44(44%) & ASA-II: 56(56%)	
Direct hernia	22(44%)	20(40%)
Indirect hernia	28(56%)	30(60%)

Group-A: Lichtenstein mesh repair & ***Group-B:*** Total extra peritoneal mesh repair

Table 2: Stratification of post-operative pain in Treatment Groups with respect to various factors

		Lichtenstein mesh repair				Total extra peritoneal mesh repair				P-value
		Post-operative pain								
		Yes		No		Yes		No		
Age (years)	20-45	21	53.85%	07	63.64%	17	58.62%	10	47.62%	0.334
	46-70	18	46.15%	04	36.36%	12	41.38%	11	52.38%	0.035
BMI	≤27	14	35.90%	01	9.09%	11	37.93%	03	14.29%	0.249
	>27	25	64.10%	10	90.91%	18	62.07%	18	85.71%	0.065
ASA Status	I	23	58.97%	04	36.36%	15	51.72%	14	66.67%	0.007
	II	16	41.03%	07	63.64%	14	48.28%	07	33.33%	0.837
Hernia Type	Direct	15	38.46%	07	63.64%	10	34.48%	10	47.62%	0.231
	Indirect	24	61.54%	04	36.36%	19	65.52%	11	52.38%	0.052

Figure-1: Postoperative Pain in Treatment Groups



DISCUSSION

Perpetuity of the operation, least complications, minimal costs, and earliest return to normal activities are important factors which determine the success of groin hernia repair. There are certain other factors like surgical skills of the surgeon, proper preoperative patients selection and effective preparation, expertise's regarding techniques of surgery and latest existing supplies for repair[1]. During past decade there is significant increases in endoscopic hernia surgery with the introduction of new surgical techniques and maneuvers. Around the world selected centers performed open hernia surgery as day care surgical procedure routinely. For surgeons as well as for patients two elements are of core importance regarding patients immediately after surgery i.e., long hospital stay and postoperative pain. It is claimed by surgeons that patients who underwent laparoscopic hernioplasty the had less postoperative pain as well as shorter hospital stay as that of those patients who underwent open hernioplasty[10,11].

Still the results vary and the controversy continues about the utmost effective inguinal hernia repair. I have conducted this study to compare the total extraperitoneal mesh repair with the lichenstein mesh repair in terms of frequency of pain after surgery. Patients age range in between 20 to 70 years with mean age of 43.88±12.69 years. In Group-A and B the mean age of patients was 44.98±12.41 years and 42.78±12.99 years respectively. Majority of the patients 5(55%) were between 20 to 46 years of age. Post-operative pain was found in 39(78%) patients in group A (lichenstein repair) while in group B (TEP repair), it was found in 29(56%) patients with p-value of 0.032. Studies conducted in Pakistan as well as internationally report TEP resulting in significantly less postoperative pain and discomfort 50% as compared to 80% at 1 week and 24% as compared to 70% at 1 month[9]. This postoperative pain in main cause of delay in return to daily activities and not being able to go back to work adds on to the economic burden of developing countries like Pakistan. In another study, 66.3% patients in TEP and 88.3% patients in lichenstein repair had pain[7].

According to a local study[11] in which sixty patients who presented with inguinal hernia were included. Mean age of patients in this study was 61.48±7 years and postoperative pain experienced by the patients ranges till 5.55 as per assessed with the help of visual analogue scale. Patients who underwent open herniplasty among them 53.33% reported server pain while patients in Group-II among them 63.34% moderate pain was recorded. In Group-A and in Group-B mean postoperative pain score was 6/23 and 4.43 respectivly[12].

It is evident from literature search that laparoscopic repair results in less postoperative pain as compared to the open herniplasty. Results of this study showed significant difference for postoperative pain in both treatment groups. i.e. (p-value=0.032) patients who underwent laparoscopic procedure their pain level was less as compared to those patients who underwent open procedure. Similarly findings were reported by other studies in literature as well as from a Cochrane review[13] and TULIP Trial[14].[13-15]

Contrary to these findings an Australian multicenter trial reported no significant difference regarding complications and recurrence for laparoscopic and open herniplasty[16]. According to the findings of a meta-analysis published in UK that open and laparoscopic hernia repair techniques are equally effective and choice of procedure can vary patient to patient as well as it depends on patient preference as well as other variables like nature of work, age and health status of the patients[17].

Various studies published locally and internationally reported no significant difference for both surgical techniques in terms of recurrence rate and morbidity but laparoscopic technique requires more operative time.[17,18]

In a large study[19] from 11 hospitals, in which 1371 male patients underwent surgery for hernia repair, among these men 665 underwent TEP and 706 underwent Lichtenstein repair. Mediation duration for both surgical

procedures was fifty five minutes and 91% patients in both treatment groups were discharged from the hospital on the same day of operation. Patients who underwent TEP they experienced less pain postoperatively, shorter sick leave period, shorter time duration for return to work and normal physical activity. (20 Days vs. 31-Days; p-value<0.001) [19].

Sven Bringman et al. in his study reported for TEP that it results in less postoperative pain as well as shorter time duration for full recovery as compared to open surgical techniques for repairing hernia. A meta-analysis concluded that patients operated with laparoscopic hernia repair had shorter rehabilitation time[20,21].

In another local study[22], less postoperative pain and requirement for analgesics were reported by patients who underwent total extraperitoneal laparoscopic repair of inguinal hernia as compared to those who underwent inguinal hernia repair by Lichtenstein tension free mesh hernioplasty. At 12 hours after surgery, the mean pain scores in the TEP group were 3.1±1.8 and in the Lichtenstein group they were 4.2±2.1 (p 0.031). At 24 hours after surgery, the scores were 2.3±1.5 and 3.1±1.9 for the TEP and Lichtenstein groups, respectively (p=0.026). At 48 hours after surgery, the mean pain scores in the TEP group were 1.5±1.1 while in the Lichtenstein group they were 2.0±1.6 (p=0.041). At 7 days after surgery, the scores were 0.3±0.5 in the TEP group and 0.4 ± 0.8 in the Lichtenstein group (0.137). The mean number of injection of Diclofenac Sodium required by the TEP and Lichtenstein groups was 3.1±1.6 and 5.8±2.2, respectively (p = 0.011)[22].

According to the results of a study in which laparoscopic hernia repair technique was compared with Lichtenstein repair on sixty patients. Patients who were treated with laparoscopic approach they reported less post-surgical pain as well as low dose of analgesia as compared to those patients who were treated with Lichtenstein technique. Similar findings were reported by an Indian study published by Dr. Snehal Fegade and Prof. Dr. R.K. Mishra[9]. A study from USA reported no significant difference regarding post-operative pain after laparoscopic and tension free mesh repairs[10].

CONCLUSION

Results of this study demonstrated that extraperitoneal mesh repair results in less postoperative pain as compared to lichenstein mesh repair. So, we recommend that total extraperitoneal mesh repair mesh repair should be used routinely for inguinal hernioplasty for reducing the post-operative pain which will in turn increase their quality of life.

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