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Research Article

**COMPARISON OF OUTCOME BETWEEN OPEN AND  
LAPAROSCOPIC TECHNIQUE FOR INGUINAL HERNIA  
REPAIR IN CASES OF LIVER CIRRHOSIS**<sup>1</sup>Dr. Iftikhar Ahmed Bhatti, <sup>2</sup>Dr. Fawad Hameed, <sup>3</sup>Dr. Ume Rubab<sup>1</sup>Associate Professor Surgery, Sharif Medical & Dental College, Lahore<sup>2</sup>Assistant Professor, Sharif Medical City Lahore<sup>3</sup>Woman Medical Officer, THQ Level Hospital, Chowk Azam (Layyah)**Abstract:**

**Objective:** To compare the outcome between open and laparoscopic technique for inguinal hernia repair in cases of liver cirrhosis.

**Material and methods:** This randomized controlled trial was conducted at Department of Surgery, Sharif Medical & Dental College Lahore from March 2018 to September 2018 over the period of 6 months. Total 90 patients of unilateral inguinal hernia and liver cirrhosis as co-morbid condition having age 20-60 years either male or female were selected. Patients of group were A managed with open surgical technique and patients of group B was managed with laparoscopic surgical technique. Outcome was compared between the both groups.

**Results:** Mean age of patients of group A was 36.01 years and mean age of patients of group B was 37.82 years. The mean operation time was greater for the patients operated by TEP than that by Lichtenstein repair with a statistically significant difference. Wound infection and scrotal edema were greater for the patients operated by Lichtenstein repair with a statistically significant difference. All complications resolved by conservative management. Hospital stay was greater for the patients operated by Lichtenstein repair than that by TEP

**Conclusions:** Elective laparoscopic inguinal hernia repair is feasible option in liver cirrhosis patients. However; despite of some better outcomes with TEP; there is insufficient evidence to conclude its greater effectiveness than Lichtenstein repair.

**Keywords:** Inguinal hernia, Liver cirrhosis, Lichtenstein repair, Laproscopic TEP repair

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## INTRODUCTION:

An inguinal hernia is a protrusion of abdominal-cavity contents through the inguinal canal. They are very common in men (lifetime risk 27% for men, 3% for women).<sup>1</sup> There are two types of inguinal hernia, direct and indirect, which are defined by their relationship 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.<sup>2</sup> About 27% of males and 3% of females develop a groin hernia at some time in their life.<sup>3</sup> Groin hernias occur most often before the age of one and after the age of fifty.<sup>4</sup> Inguinal, femoral and abdominal hernias resulted in 51,000 deaths in 2013 and 55,000 in 1990.<sup>5</sup>

The prevalence of abdominal hernias in liver cirrhosis (LC) patients has been reported up to 20% and as high as 40% in case of major ascites, which is remarkably higher than the general population.<sup>6-7</sup> In end-stage LC patients, the refractory ascites increases the intra-abdominal pressure, and the malnutrition leads to attenuation of abdominal wall fascia and weakness of muscle, these factors contribute to the development of abdominal hernia. Recent studies have reported that LC patients with hernia were twice more likely to undergo emergency surgery compared to non-cirrhotic patients, and emergency herniorrhaphy experienced a greater than 7-fold mortality than elective procedure in cirrhotic patients.<sup>8-9</sup>

Patients with liver cirrhosis undergoing elective inguinal hernia repair after medical optimization had incidence of postoperative complications and long-term recurrence which is not different from patients without liver cirrhosis.<sup>10-11</sup> However, the optimal surgical approach of inguinal hernia in patients with liver cirrhosis laparoscopic or open is still undefined. Whether laparoscopic inguinal hernia repair is safe and potentially affords superior outcomes in patients with liver disease is unknown. Searching in literature, a single recent study revealed that patients with liver disease operated by laparoscopic inguinal hernia repair had similar morbidity, hospital stay, and recurrence rate compared to those operated by open repairs with a slightly longer operative time suggesting that both approaches are viable repair options.<sup>12</sup> Aim of this study is to assess the outcomes of laparoscopic inguinal hernia repair compared to open procedures regarding postoperative complications and recurrence rate in patients with liver cirrhosis.

## MATERIAL AND METHODS:

This randomized controlled trial was conducted at Department of Surgery, Sharif Medical & Dental College Lahore from March 2018 to September 2018 over the period of 6 months. Total 90 patients of unilateral inguinal hernia and liver cirrhosis as co-morbid condition having age 20-60 years either male or female were selected.

Patients with irreducible hernia, obstructed and strangulated hernias (not reducible on examination), patients with h/o previous lower abdominal surgery, h/o previous mesh placement in the preperitoneal space and patients unfit for anesthesia were excluded from the study.

Study was approved by ethical committee and written informed consent was taken from every patient.

Selected patients were divided into two groups A and B. Group A was consisted on 48 patients and group B consisted n 42 patients. Patients of group were A managed with open surgical technique and patients of group B was managed with laparoscopic surgical technique. According to department protocol; open technique was the Lichtenstein repair with the use of polypropylene mesh to provide a tension-free repair and Laparoscopic inguinal hernia repair were undertaken with the laparoscopic total extra-peritoneal (TEP) approach. Proline mesh was used for groin repair in all cases with fixation by absorbable tacks.

Data collected included patient demographics, etiology of liver cirrhosis, preoperative Child-Turcotte-Pugh class (CPT) and MELD score, operative procedure type, operation time, postoperative complications, hospital stay and persisting groin pain and numbness and hernia recurrence at follow up.

Collected data was entered in SPSS version 20 and analyzed. Mean and SD was calculated for numerical data and frequencies were calculated for categorical data. Comparison of post operative outcome between the both groups was done. Chi-square test was used to detect difference between the two groups. P value  $\leq$  0.05 was considered as significant.

## RESULTS:

Mean age of patients of group A was 36.01 years and mean age of patients of group B was 37.82 years. In group A, male patients were 42 and female patients were 6. While in group B male patients were 38 and female patients were 4. In study group A, child-pughe class I patients were 42, class II were 6 and no patient found with class III. While in study group B, child

pughe class-I, II and III were 39, 3 and 0 patients respectively. Total 40 patients of group A and 40 patients of group B found with right side hernia and left side hernia was observed in 8 patients of group A while in 2 patients of group B. (Table 1)

All operative procedures performed electively. Type of anesthesia was determined by an anesthesiologist after individual patient evaluations; whether general or spinal anesthesia. All the laparoscopic procedures were performed under general anesthesia. Open technique was the Lichtenstein repair and laparoscopic inguinal hernia repair were undertaken with the total extra-peritoneal (TEP) approach. TEP in three cases were converted to the transabdominal preperitoneal (TAPP) technique due to technical difficulties. Postoperative data are shown in table 2.

The mean operation time was greater for the patients operated by TEP than that by Lichtenstein repair with a statistically significant difference (Table 2). Wound infection and scrotal edema were greater for the patients operated by Lichtenstein repair with a

statistically significant difference. All complications resolved by conservative management. Hospital stay was greater for the patients operated by Lichtenstein repair than that by TEP (Table 2).

Mean follow-up for the patients was 16.9 months (range: 2-32months). Recurrence of hernia developed in 3 patients with Lichtenstein repair. The mean time to recurrence was 13.9 months (range: 6-18 months). All recurrent hernias developed in patients who had ascites at the time of the initial operation. No recurrence of hernia occurred in the patients operated by TEP. Persisting groin pain and numbness were greater for the patients operated by Lichtenstein repair with a statistically significant difference. During follow-up, an inguinal hernia developed at the contralateral side in six patients (12.5%) repaired by Lichtenstein repair and in two patients (4.7%) operated by TEP. CTP class was not found to be related to contralateral hernia development (class A; 4.4% and class B; 4.5%, respectively;  $p=0.68$ ) however, the latter was found to be related to the presence of ascites (0.9% versus 4.6%;  $p=0.001$ ).

**Table 1: Characteristics of patients.**

Variables	Open (n=48)	Lap (n=42)
Age (mean range), years	36.01 (16-57)	37.82 (18-63)
Male /Female ratio	42/6	38/4
<b>Childe-pughe-turcotte (n)</b>		
Class I	42	39
Class II	6	3
Class III	0	0
MELD score (mean& range)	7.5 (6.4-39.5)	7.3 (6.4-38.6)
Ascites(n)	3	0
<b>Hernia side (n)</b>		
Right	40	40
Left	8	2
<b>Co morbidity (n)</b>		
Diabetes	12	10
Obstructive pulmonary disease	8	2

**Table 2: Postoperative outcomes.**

Outcome	Open (n=48)	Lap (n=42)	P value
Operation time (minutes)	45 (30-65)	55 (45-75)	0.02
Postoperative complications	N (%)	N (%)	
Wound (or trocar site) hematoma	3 (6.25)	2 (4.76)	0.03
Wound (or trocar site) seroma	1 (2.08)	2 (4.76)	0.06
Scrotal edema	4 (8.33)	0 (0)	0.0001
Wound (ports sites) infection	6 (12.5)	1 (2.38)	0.0001
Acute urinary retention	3 (6.25)	0(0)	0.002
Postoperative ascites	5 (10.4)	4 (9.52)	0.06
Hospital stay(mean) days	3.56	1.5	0.001
Recurrence	3 (6.25)	0 (0)	0.002
Persisting groin pain and numbness	22 (33.33)	4 (9.52)	0.0001

**DISCUSSION:**

Risk for postoperative wound-healing complications in open groin hernia surgery is increased in patients with liver cirrhosis. Risk of hemorrhage or hematoma within 30 days and postoperative wound infection were found to be significantly increased.<sup>13</sup> Also, postoperative morbidity and mortality rates in patients with liver cirrhosis who undergo non-hepatic surgery are greatly depending on severity of the cirrhosis and the type of surgical procedure. Surgery procedure can be safely performed in patients with low MELD scores or CTP class- A without portal hypertension as well as, with the minimally invasive techniques.<sup>14-15</sup>

The advent laparoscopic approach to inguinal hernia repair is a safe and reliable method with a similar recurrence rate as the open tension-free mesh repair. Advantages involve fewer incidences of wound infection and hematoma, less chronic postoperative pain and numbness and decreased recovery time.<sup>16-17</sup> However, careful attention should be given to the technical details to avoid the incidence of life-threatening complications including intestine, vascular or bladder injury which is more common with laparoscopic manipulations.<sup>18-19</sup>

In this study operation times for laparoscopic repair were longer compared to open mesh methods which are consistent with other studies.<sup>18,20</sup> There were no serious complications. Scrotal edema and wound infection were greater for the patients operated by open technique with a statistically significant difference. Lengths of hospital stay were greater for the patients operated by open technique than that by laparoscopic hernia repair.

Laparoscopic surgery was associated with less long-term numbness and less pain in the groin which is consistent with other studies.<sup>21-22</sup> No recurrence of hernia occurred in the patients operated by laparoscopic inguinal hernia repair in our study on contrary with other studies found hernia recurrence was not different between laparoscopic approach and open mesh repair.<sup>17-18</sup>

The choice between the transabdominal preperitoneal (TAPP) procedure and the totally extraperitoneal (TEP) procedure should be based on surgeon because there is no evidence of superiority between both.<sup>16</sup> According the European Hernia Society guidelines; TEP repair is preferred to a TAPP because it reduces short-term postoperative pain more effectively than TAPP repair and results in shorter hospital stay of primary cases.<sup>17</sup> In contrast, TAPP repair is correlated with the advantage of that the technique is more familiar and much easier and of a shorter surgery duration. These findings show that shared decision-making regarding both approaches of laparoscopic hernia repair may be needed.<sup>23-24</sup> A totally extraperitoneal approach potentially offers advantage of eliminating complications related to violating the peritoneal cavity to reach the extraperitoneal space which is beneficial in patients with liver cirrhosis which may have minimal or potential ascites. Although Lichtenstein operation was associated with a shorter operating time however, TEP repair had less wound infections, less chronic neuralgia pain that enabled patients to return to work at a shorter time. There is statistically significant difference in terms of hernia recurrence for TEP repair in our study with

follow-up time is less than 3 years. Other studies when follow-up time is more than 3 years, there was no significant difference in recurrence rate compared with Lichtenstein repairs.<sup>25-26</sup> The latter is considered as limitation in our study in addition to it is not a controlled randomized trial, to conclude superiority of laparoscopic inguinal hernia repair compared to open inguinal hernia repair in postoperative outcomes for patients with liver cirrhosis and future research is required.

### CONCLUSION:

Elective laparoscopic inguinal hernia repair is feasible option in liver cirrhosis patients. However; despite of some better outcomes with TEP; there is insufficient evidence to conclude its greater effectiveness than Lichtenstein repair.

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