The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/2019.26.07.3773

ORIGINAL PROF-0-3773

COMPARISON OF OPEN MESH HERNIOPLASTY WITH LAPAROSCOPIC TOTAL EXTRAPERITONEAL (TEP) MESH REPAIRS FOR INGUINAL HERNIAS.

Muhammad Usman[1], Kaiser Saleem[2], Osman Riaz Dab[3], Rana Asrar Ahmad Khan[4], Saddaqat Hayat[5], Ata Ul Lateef[6]

1. MBBS, FCPS General Surgery
Senior Registrar
Department of Surgery
Allied Hospital, Faisalabad.
2. MBBS, MD
Resident IM/PM
Griffin Hospital, Derby
Connecticut USA.
3. MBBS, FCPS General Surgery
Senior Registrar
Department of Surgery
Allied Hospital, Faisalabad.
4. MBBS, FCPS
Assistant Professor
Department of Surgery
Allied Hospital, Faisalabad.
5. MBBS, MRCS, FCPS
Senior Registrar
Department of Surgery
Allied Hospital, Faisalabad.
6. MBBS, FCPS
Associate Professor
Department of Surgery
Allied Hospital, Faisalabad.

Correspondence Address:
Dr. Muhammad Usman
Department of Surgery
Allied Hospital, Faisalabad.
doctor_usman@hotmail.com

Article received on:
01/03/2018
Accepted for publication:
22/01/2019
Received after proof reading:
25/06/2019

ABSTRACT… Open Lichtenstein inguinal hernioplasty is universally accepted as a safe, well-understood method with a high success rate, the laparoscopicrepair of an inguinal hernia is a comparatively recent technique. This study is conducted to evaluate a technique with better efficacy that will be offered to the patients in the future. To compare the outcome of open mesh hernioplasty (Lichtenstein technique) with laparoscopic total extraperioneal (TEP) mesh repairs for the treatment of inguinal hernias. **Study Design:** Randomized control trial. **Setting:** Department of Surgery, Allied Hospital, Faisalabad. **Period:** From 7th February 2014 to 6th August 2014. **Materials and Methods:** 154 male patients with age between 20-45 years were included. Patients having INR > 1.5, history of chronic cough and previous abdominal surgery were excluded. Laparoscopic hernioplasty was performed in group A (n=77) and open hernioplasty was performed in group B (n=77). **Results:** The mean age of the patients was 32.91±7.78. In group A, 3 (3.9%) patients had ascrotal hematoma, while it was 12(15.6%) in group B. There is statistically significant difference between two groups (p-value=0.014). **Conclusion:** Laparoscopic TEP can be performed safely with acceptable postoperative complication and is better treatment modality than open mesh hernioplasty.

Key words: Inguinal Hernia, Post-operative Pain, Postoperative Complication, Recurrence.

Article Citation: Usman M, Saleem K, Dab OR, Khan RAA, Hayat S, Ata Ul Lateef. Comparison of open mesh hernioplasty with laparoscopic total extraperitoneal (TEP) mesh repairs for inguinal hernias. Professional Med J 2019; 26(7):1090-1095. **DOI:** 10.29309/TPMJ/2019.26.07.3773

INTRODUCTION

Inguinal hernia is one of the most frequently performed surgical procedure worldwide with an estimated 800,000 cases per year in the United States alone, and 20 million procedures across the globe annually.[1,2,3,4] Inguinal hernia repair consumes an important part of health care resources because of the high incidence of the problem. Inguinal hernia repair is probably the field where the surgeons have most variable alternatives in general surgery.[5]

There are many different techniques for the repair of inguinal hernias. Inguinal hernia repair has been evolving for the past 130 years and the pace of evolution accelerated by the introduction of the open mesh repair technique for an inguinal hernia by Lichtenstein in 1986.[6] The Lichtenstein technique has since become the frequently used (with various modifications) on account of its easiness and as it provides a tension-free repair with good long-term results. Tension-free mesh repair is, however, associated with complications such as a foreign body reaction, infection, pain, fistula formation, migration, shrinkage, and recurrence.[7]

Laparoscopic hernia repair was first described in 1982. There are two basic laparoscopic techniques, trans-abdominal pre-peritoneal (TAPP) and total extraperitoneal (TEP).[8] Of laparoscopic procedures employed today, the totally extraperitoneal approach (TEP) is recommended by European hernia society rather than transabdominal (TAPP).[9] Laparoscopic repair of an inguinal hernia is a recent advancement,

although less conventional, but shows low recurrence rate, less postoperative pain, early recovery and return to work, low rate of early and late complications.[10] Despite the wide interest that has been gained in laparoscopic inguinal hernia repair, this approach as a gold standard treatment for inguinal hernia repair has not yet been accepted.[11]

Different studies show contradictory results about the effectiveness of Lichtenstein technique and TEP. For instance Kirshan Lal's study stated that TEP is better than Lichtenstein technique in terms of development of scrotal hematoma (1.9% and 12.2%, respectively)[8], another study stated that there is an equal chance of development of scrotal hematoma in both Lichtenstein technique and TEP (9% and 10% respectively).[12]

Inguinal hernia repair is the most frequently performed operations in general surgery. The results of the above-mentioned studies show controversy in terms of preferred technique of repair. So, this study was conducted to evaluate the technique with better efficacy that will be offered to the patients in the future.

OBJECTIVE

The objective of this study was to compare the outcome of open mesh hernioplasty (Lichtenstein technique) with laparoscopic total extraperioneal (TEP) mesh repairs for the treatment of inguinal hernias.

MATERIALS AND METHODS

This study was a randomized controlled trial conducted at the Department of Surgery, Allied Hospital, Faisalabad, Pakistan from 7th February 2014 to 6th August 2014. Total 154 patients were enrolled in two groups (77 in each group) using purposive, non-probability sampling. Patients of age 20-45 years of both genders with an inguinal hernia were included in the study. Recurrent and bilateral inguinal hernia patients were also included in the study. Exclusion criteria include the Patients found unfit for general anesthesia or laparoscopic surgery (INR > 1.5); History of chronic or persistent cough; History of previous abdominal surgeries and Presentation of any infective lesion at or around the site of the incision.

After taking approval from hospital ethical committee, patients coming through OPD (out patient department) fulfilling the inclusion criteria was enrolled and informed consent was taken. Patients were randomly allocated by computer generated random number table in two equal groups: 77 patients in group A underwent laparoscopic hernioplasty and 77 patients in group B underwent open hernioplasty. The principle operative technique was total extra-peritoneal repair in the laparoscopic group and Lichtenstein's repair in open group. Both the procedures were performed by the same team of surgeons.

The primary outcome, i.e. scrotal hematoma (swelling of the scrotum) was assessed clinically and thepresence of blood in the scrotum was confirmed by ultrasound by the radiologist. Each patient was followed for 15 days. All the information was collected on a specially designed proforma and analyzed by using SPSS version 16. Descriptive statistics including mean and standard deviation of numeric values like age was evaluated. The presence of scrotal hematoma was presented as frequency and percentage and it was compared by using chi-square test between both groups. Effect modifiers like age were controlled by stratification. Post-stratification chi-square test was applied. p-value less than 0.05 was considered significant.

RESULTS

A total of 154 patients with an inguinal hernia were included in the study and randomly divided into 2 groups. Group A was laparoscopic total extra peritoneal mesh repair while group B was open mesh hernioplasty.

Out of 154 patients, mean age of the patients was 32.91±7.78 years. In group A, out of 77 patients mean age of the patients was 31.96±7.28 years. In group B, out of 77 patients mean age of the patients was 33.86±8.18 years. Stratification for age groups is shown in Table-I.

In group A, 46 (59.7%) patients had right sided

inguinal hernia, 23 (29.9%) patients had left sided inguinal hernia and 8 (10.4%) patients had bilateral inguinal hernia. In group B, 41 (53.2%) patients had right sided inguinal hernia, 29 (37.7%) patients had left sided inguinal hernia and 7 (9.1%) patients had bilateral inguinal hernia (p-value = 0.593).

In group A, 34 (44.2%) had direct inguinal hernia while 43 (55.8%) patients had an indirect inguinal hernia. In group B, 24 (31.2%) had direct inguinal hernia and 53 (68.8%) patients had an indirect inguinal hernia (p-value = 0.096). In group A, recurrent hernia was present in 18 (23.4%) patients while in group B it was founded in 24 (31.2%) patients (p-value = 0.278).

Out of 154 patients, scrotal hematoma was present in 15 (9.7%) patients. In group A, scrotal hematoma was present in 3 (3.9%) patients, whereas in group B, it was found in 12 (15.6%) patients (p-value = 0.014) (Table-II).

In group A, scrotal hematoma was present in 1 (2.9%) patients having direct inguinal hernia while 2 (4.7%) patients withan indirect inguinal hernia. In group B, scrotal hematoma was present in 5 (20.8%) patients having direct inguinal hernia while 7 (13.2%) patients withan indirect inguinal hernia (p-value = 0.799) (Table-III).

In group A, no scrotal hematoma was found in patients with recurrent inguinal hernia while in group B, scrotal hematoma was found in 3 (12.5%) patients having arecurrent inguinal hernia (p-value = 0.379) (Table-IV).

Age distribution Variable	Group		Total
	Laparoscopic Total Extraperitoneal Mesh Repair	Open Mesh Hernioplasty	
21-25	22 (28.6%)	16 (20.8%)	38 (24.7%)
26-30	23 (29.9%)	22 (28.6%)	45 (29.2%)
31-35	3 (3.9%)	1 (1.3%)	4 (2.6%)
36-40	9 (11.7%)	12 (15.6%)	21 (13.6%)
41-45	20 (26.0%)	26 (33.8%)	46 (29.9%)
Total	77	77	154

Table-I. Distribution of age among both groups
p-value = 0.528

Scrotal Hematoma	Group		Total
	Laparoscopic Total Extraperitoneal Mesh Repair	Open Mesh Hernioplasty	
Yes	3 (3.9%)	12 (15.6%)	15 (9.7%)
No	74 (96.1%)	65 (84.4%)	139 (90.3%)
Total	77	77	154

Table-II. Scrotal hematoma among both groups
p-value = 0.014

Scrotal Hematoma	Group				P-Value
	Laparoscopic Total Extraperitoneal Mesh Repair		Open Mesh Hernioplasty		
	Type of Hernia		Type of Hernia		
	Direct	Indirect	Direct	Indirect	
Yes	1 (2.9%)	2 (4.7%)	5 (20.8%)	7 (13.2%)	0.799
No	33 (97.1%)	41 (95.3%)	19 (79.2%)	46 (86.8%)	
Total	34	43	24	53	

Table-III. Scrotal hematoma among both groups according to type of hernia

Scrotal Hematoma	Group				P-Value
	Laparoscopic Total Extraperitoneal Mesh Repair		Open Mesh Hernioplasty		
	Recurrent Hernia		Recurrent Hernia		
	Yes	No	Yes	No	
Yes	0	3 (5.1%)	3 (12.5%)	9 (17%)	0.568
No	18 (100%)	56 (94.9%)	21 (87.5%)	44 (83%)	
Total	18	59	24	53	

Table-IV. Scrotal hematoma among both groups according to recurrent hernia

DISCUSSION

The history of treating groin hernias has evolved from life-saving procedures for a strangulated hernia in the past to elective short stay surgery for uncomplicated hernias today.

The Lichtenstein repair is currently the most appropriate operation for primary inguinal hernias. It is associated with an excellent outcome in the hands of non-specialist surgeons and results in less postoperative pain and early return to normal activities when compared with suture repairs.[7]

Laparoscopic total extra peritoneal repair has established itself as a favored procedure with comparable results to open surgery and is set to become the future standard of care.[13,14] However, the laparoscopic hernia repair has been criticized for technical difficulties, cost, and a long learning curve.[15,16] The indications for laparoscopic hernia repair have been debated.[17] Many of the publications that have been the foundation for the debate have been studies using the trans abdominal preperitoneal (TAPP) technique in a randomized design compared with a conventional open repair with or without mesh.[18] In the present study, we used TEP since it does not involve entering the abdominal cavity.

The results of this study revealed that the majority of the patients belong to the age of 26-30 (29.2%) and 41-45 years (29.9%). Recurrent hernia was found in 27.3% (23.4% in TEP group and 31.2% in the open mesh group). Indirect hernia was found to be in 62.3% (55.8% in TEP group and 68.8% in the open mesh group) and in most of the cases 56.5% (59.7% in TEP group and 53.2% in the open mesh group) inguinal hernia was present on the right side. In laparoscopic total extraperitoneal mesh repair, scrotal hematoma was found to be in 3.9% while in open mesh hernioplasty it was in 15.6%.

Krishan Lal et al[8] conducted a study in Jamshoro on the comparison of laparoscopic total extra peritoneal mesh repair and open mesh hernioplasty. They observed that the majority of the patients (53%) belongs to 41-55 years of age. The indirect hernia was present in 67% in laparoscopic total extra peritoneal mesh repair group and 64.9% in open mesh hernioplasty. Right sided hernia is more common (40.3% in laparoscopic total extra peritoneal mesh repair group and 61.4% in open mesh hernioplasty group. The scrotal hematoma was found to be in 1.9% patients in laparoscopic total extra peritoneal mesh repair group while 12.2% in open mesh hernioplasty. They concluded that laparoscopic total extra peritoneal mesh repair is the best option of treatment for are current and bilateral hernia which favors the results of our study.

Bringman S et al[17] conducted a study on the comparison of laparoscopic TEP, Mesh plug, and Lichtenstein procedure. They observed that the hematoma was present in 3.3% patients in TEP group and 7.8% patients in Lichtenstein group. They concluded that laparoscopic TEP is superior to Lichtenstein and mesh plug techniques in terms of postoperative complications and rehabilitation. These results are comparable to our study.

Meta-analyses revealed that laparoscopic and open mesh repairs for recurrent inguinal hernias were equivalent in most of the analyzed outcomes. Fewer hematoma formations were observed in the laparoscopic group in comparison with the Lichtenstein group.[19]

Nadir SM, et al[7] conducted a study in Karachi about the efficacy of the Lichtenstein procedure for treatment of an inguinal hernia. The results of their study showed that the majority of the patients (31.25%) belongs to an age range between 21-30 years. 75.89% patients had anindirect inguinal hernia. The hematoma was found in 6.2% patients. They concluded that the Lichtenstein repair procedure is a safe method with low post-operative complications.

Bhatti N, et al[20] conducted a study on the early outcome of laparoscopic TEP in Larkana, Pakistan. The study results showed that the hematoma was noticed in 2.4% patients. They concluded that laparoscopic TEP is a new and safe technique for inguinal hernia repair with acceptable rates of morbidity.

Recurrent and bilateral hernias are another specific issues. Laparoscopic techniques are good options for these cases. EHS recommends Lichtenstein and endoscopic repairs for these issues.[21] Results of our study are also in favor of these recommendations.

In a study conducted by Chung et, al[16] showed that most of the patients (48.1%) presented with the right sided hernia. An indirect hernia was found to be in 64.3% patients. The hematoma was present in 3.6% patients in laparoscopic TEP hernioplasty and 5.4% patients in open mesh repair which shows both the techniques are equally effective in terms of postoperative complication i.e. hematoma which is against the results of our study.

Gürbulak EKet al[11] concluded that the complications and recurrence rates and effects on testicular effusion and testicular volume in both laparoscopic and open techniques are similar, whereas the laparoscopic approach has shorter operative time than open hernia repair. So these results favor the laparoscopic technique is better than open technique.

Aly O et al[12] conducted a systemic review at University of Aberdeen, U.K on a comparison of laparoscopic total extra peritoneal mesh repair and open mesh repair. They observed that scrotal hematoma was present in 10% patients in laparoscopic TEP group and 9 % in open mesh hernioplasty. They concluded that both laparoscopic TEP and Lichtenstein repair are clinically effective procedures. The results of our study showed that laparoscopic TEP is better than Lichtenstein repair. The difference between the results of our study and above mentioned studies may be due to some technical difficulties faced by the surgeons.

CONCLUSION

Laparoscopic TEP can be performed safely with acceptable post-operative complication and is better treatment modality than open mesh hernioplasty. Laparoscopic TEP is also a better option of treatment for arecurrent and bilateral hernia. It can be used as the first line treatment for an inguinal hernia in future with less postoperative complication.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Muhammad Usman	Principal author, Main idea, Data analysis & result compilation.	
2	Kaiser Saleem	Critical review of manuscript.	
3	Osman Riaz Dab	Reference collection.	
4	Rana Asrar Ahmad Khan	Provision of data.	
5	Saddaqat Hayat	Data analysis & reference collector.	
6	Ata Ul Lateef	Provision of data.	