



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR | Volume 6 | Issue 1 | Jan - Mar - 2018
www.ijamscr.com

Research article

Medical research

Prospective study of laparoscopic totally extraperitoneal repair (TEP) & open mesh hernioplasty

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ABSTRACT

Background

Inguinal hernia repair by laparoscopy has gained much importance in the past decade as it has been shown to be associated with lesser incidence of morbidity and a faster postoperative recovery than open repair, however many laparoscopic surgeons are still reluctant to adopt this technique because of long learning curve.

Materials and Methods

This was a hospital based prospective study comparing the results of TEP & open hernia repair. The study was conducted in the Department of General Surgery, Hamdard Institute of Medical Sciences and Research, New Delhi. Data from all the patients was collected prospectively over a period of 2 years from June 2015 to June 2017. A total of 160 patients were enrolled in the study. Patients were divided into laparoscopic (Group A) and open hernia repair group (Group B) strictly based on patient preference and anaesthetic risks after meeting the inclusion criteria. Patients with uncomplicated, unilateral/bilateral inguinal hernia were included in the study. Polypropylene mesh was used in both procedures. Tacks were used in TEP for the fixation of mesh. Data collected was analysed and expressed as average, mean/median.

Results

All patients in our study were men in the age group of 20 to 60 years and above, with a mean age of 49 years in group A and 53 years in group B. All patients in our study had unilateral inguinal hernia. Postoperative pain was slightly more in group B (7.5%) than group A patients (2.5%). Postoperative urinary retention was found to be lower in group A (2.5%) compared to group B (7.5%). In our study 02 patients (2.5%) in group A developed postoperative seroma and same complication was found in 06 patients (7.5%) of group B. Our study found a superficial wound infection rate of 1.25% and 5% in groups A and B respectively. The average hospital stay in our study was 2.5 days in group A and 3 days in group B. The recurrence rate in group A and group B was 0% and 2.5% respectively. Laparoscopic repair was found to be slightly costlier than open hernia repair in our study.

Conclusion

Laparoscopic TEP repair is a safe option in expert hands for the repair of uncomplicated inguinal hernias. Although, slightly costly with marginally higher rate of recurrence, laparoscopic hernia repair has comparable results with open hernia repair with fewer general complications.

Keywords: Hernia, Mesh, TEP

INTRODUCTION

A hernia is defined as an abnormal protrusion of a viscera or tissue through a defect in its surrounding wall. Abdominal wall, particularly the inguinal region is affected commonly by these defects. [1]

The prevalence of abdominal wall hernias is 1.7% for all ages and 4% for those aged over 45 years. Inguinal hernias comprise 75% of abdominal wall hernias, with a lifetime risk of 27% in men and 3% in women. [2] 95% of patients with inguinal hernias are men, and in men the incidence rises from 11 per 10 000 person years aged 16-24 years to 200 per 10 000 person years aged 75 years or above. [3] The treatment of choice for inguinal hernia regardless of type is surgical repair. Repair of inguinal hernia is one of the most common procedures performed in all general surgery departments across the world, with rates ranging from 10 per 100 000 of the population in the United Kingdom to 28 per 100 000 in the United States. [4]

Herniorraphy and hernioplasty are the two main procedures done for hernia repair. Herniorraphy is the strengthening of posterior wall of the inguinal canal with the help of sutures. Hernioplasty is strengthening the posterior wall of the inguinal canal with the help of tissue or synthetic mesh, which can be done by open or laparoscopic methods. The open method is famous Lichtenstein tension free repair. Laparoscopic methods are totally extraperitoneal repair (TEP) and transabdominal preperitoneal repair (TAPP).

In our study we performed TEP and Lichtenstein repair and analysed the data prospectively with regards to age group, seroma formation, immediate postoperative pain, wound infection, chronic groin pain, recurrence, hospital stay and cost and affordability.

Patients and methods

This was a hospital based prospective study conducted in the Department of General Surgery, Hamdard Institute of Medical Sciences and Research, New Delhi. The study was conducted over a period of 2 years from June 2015 to June 2017, with a mean follow up of 6 months. A total of 160 patients were included in the study. All patients diagnosed clinically of having inguinal hernia were directly admitted from the outpatient department a day prior to surgery.

Inclusion criteria of our study were

1. Patients of both genders
2. Patients in the age group of 20 to 80 years
3. Patients having either unilateral or bilateral inguinal hernia

Exclusion criteria of our study were

1. Patients having complicated hernia
2. Patients with malignancies
3. TEP converted to open repair

Patients were divided in 2 groups, group A (TEP group) and group B (Open group) based on the patient preference and general anaesthetic risks. Patients having contraindications to laparoscopy were included in group B. There were 80 patients in either group. Group A patients underwent TEP and group B patients underwent standard Lichtenstein repair. In both groups of patients polypropylene mesh was used.

Patients were given free choice regarding the method of surgery and accordingly patients were grouped after proper explanation of both the procedures. A detailed preoperative clinical examination was done and patients were selected as per the inclusion and exclusion criteria laid for the study. After anaesthetic clearance, patients were operated by standard techniques in accordance with recommended guidelines. A single dose of prophylactic intravenous antibiotic (Ceftriaxone 1gm) was given half an hour before surgery. Patients in group A were operated by a standard 3 port technique. Preperitoneal space was created used 0 degree scope. Group B patients were operated using groin crease incision on the respective side. Both groups of patients were operated in the supine position. Prolene 15x12 mesh was used in both groups. In group A patients absorbable tacks were used for mesh fixation and in group B patients Prolene 3,0 was used for mesh fixation.

All patients were managed postoperatively in the ward. In postoperative period Diclofenac 75mg was given intravenously for analgesia, which was then either stopped or switched over to oral Diclofenac as per the need of the patients. All patients were started on oral diet after 12 hours of surgery. Postoperative analgesia was monitored in terms of route and frequency per day.

Most of our patients were discharged on 3rd postoperative day. Patient had their first follow up

visit on 10th postoperative day. Sutures were removed on the same day. Patients were then followed up for a period of next 6 months.

Data collected was saved on each visit and analysed after the follow up was over. The data was entered in Microsoft Excel and expressed as average, mean/median.

RESULTS

Patients included in the study were divided in two groups.

Total Patients	Group A (TEP)	Group B (Open Repair)
160	80	80

Out of 80 patients, 77 were male and 3 were female

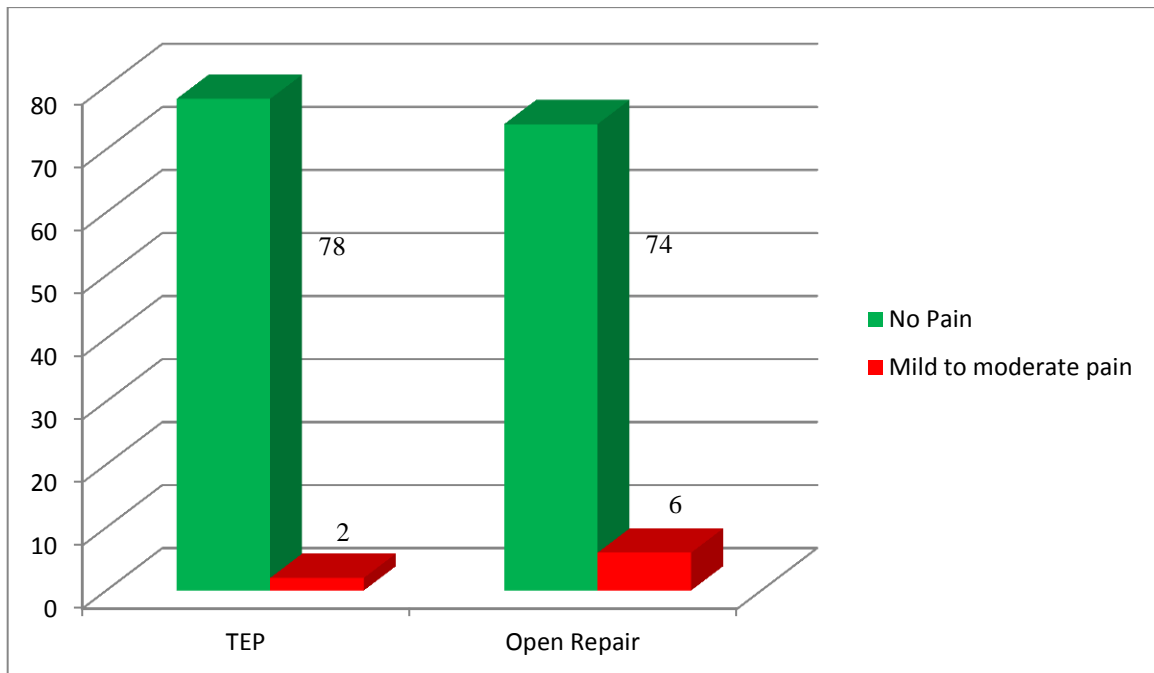
Total Patients	Male	%age	Female	%age
160	160	100	0	0

Age distribution

Age (Years)	Group A	Group B
20-40	18	14
41-60	43	56
61-80	19	10
Total	80	80
Mean	49	53

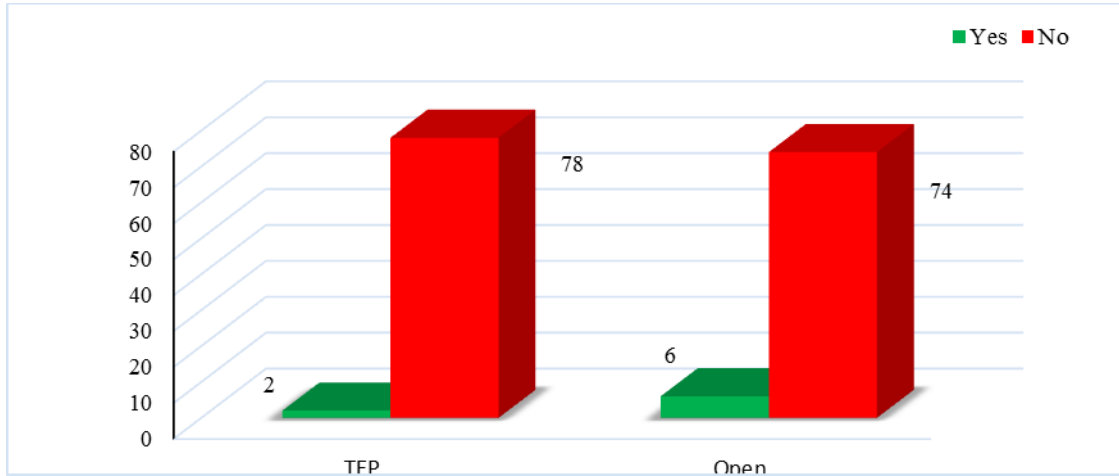
Postoperative pain as assessed by need for postoperative analgesia

Procedure	No pain/mild pain	%age	Moderate pain	%age
TEP	78	97.5	02	2.5
Open Repair	74	92.5	06	7.5



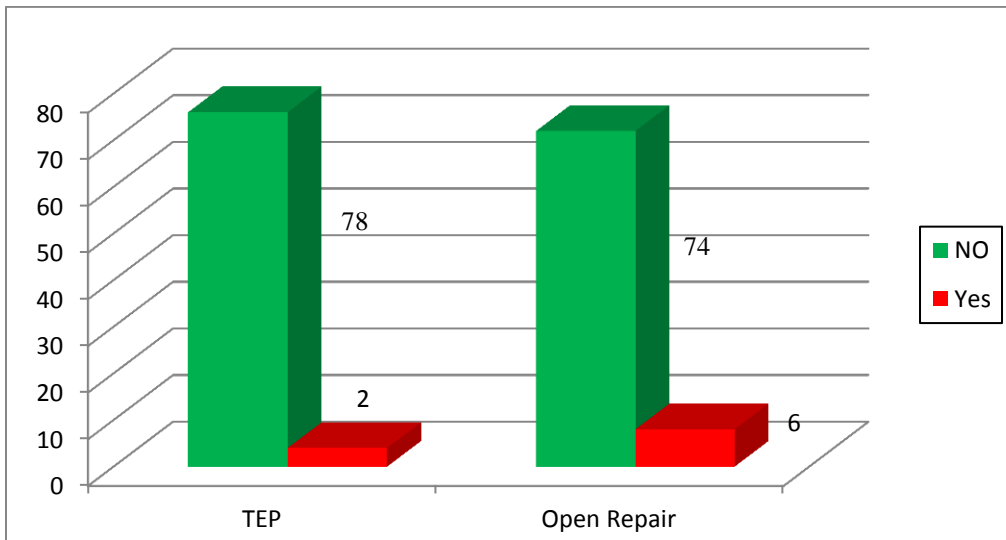
Postoperative urinary retention

Urinary retention	Group A	%age	Group B	%age
Yes	02	2.5	06	7.5
No	78	97.5	74	92.5
Total	80	100	80	100



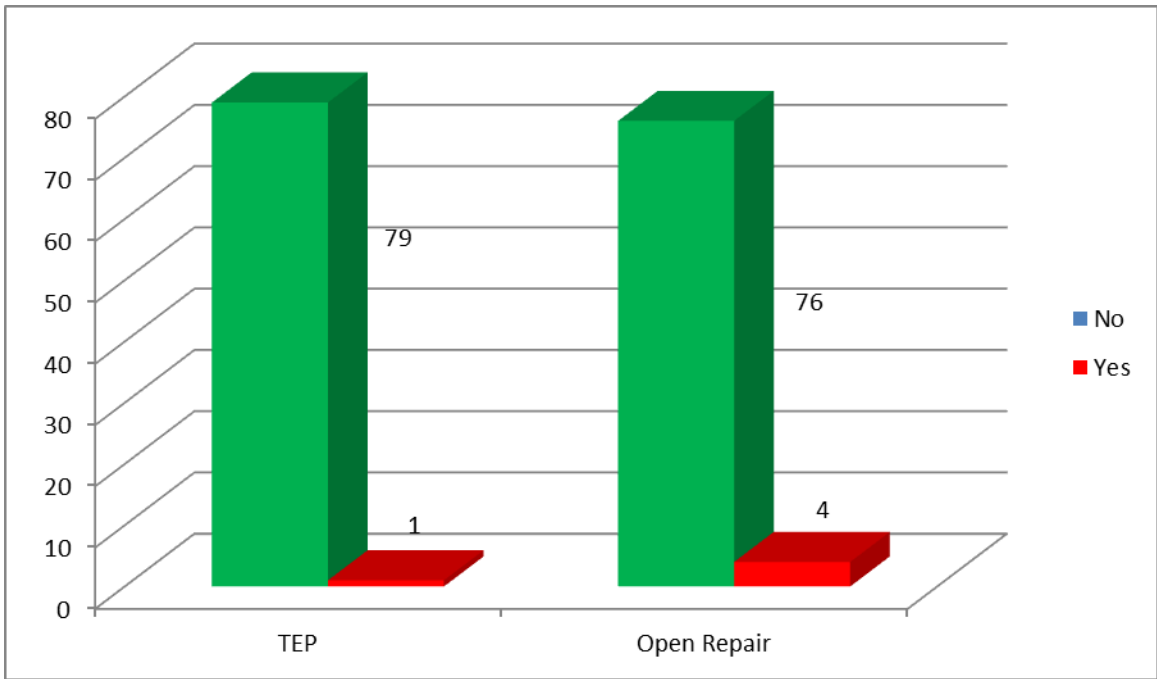
Postoperative seroma formation

Seroma	Group A	%age	Group B	%age
Yes	02	2.5	06	7.5
No	78	97.5	74	91.5
Total	80	100	80	100



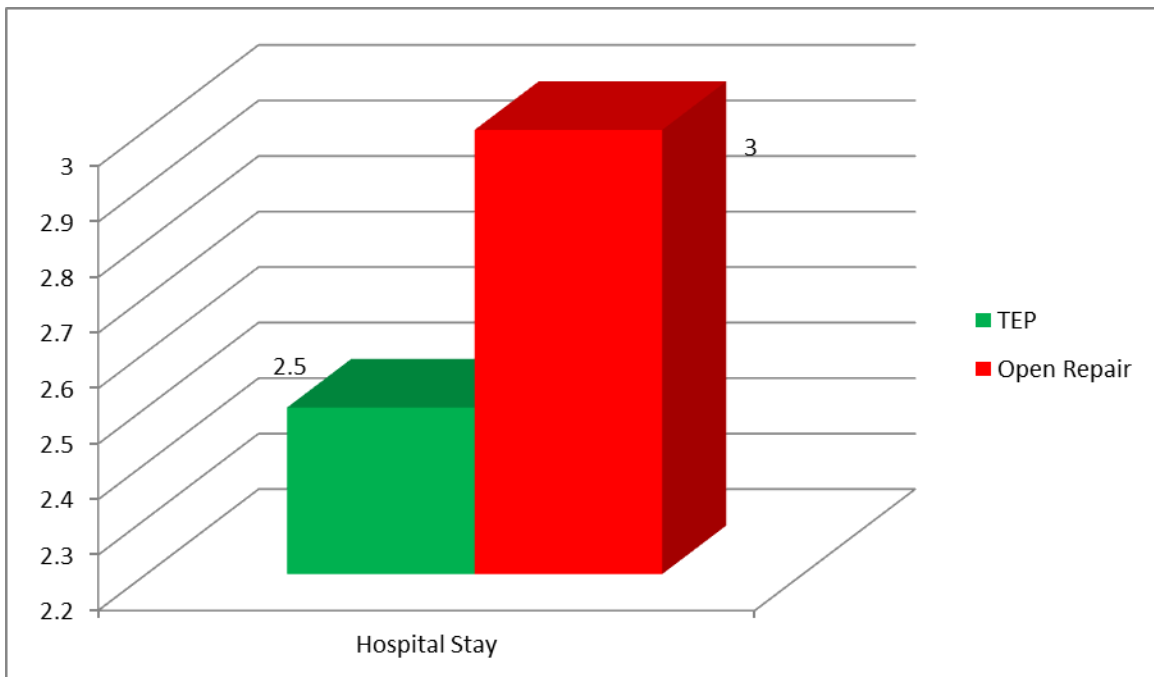
Superficial wound infection

Infection	Group A	%age	Group B	%age
Yes	01	1.25	04	05
No	79	98.75	76	95
Total	80	100	80	100



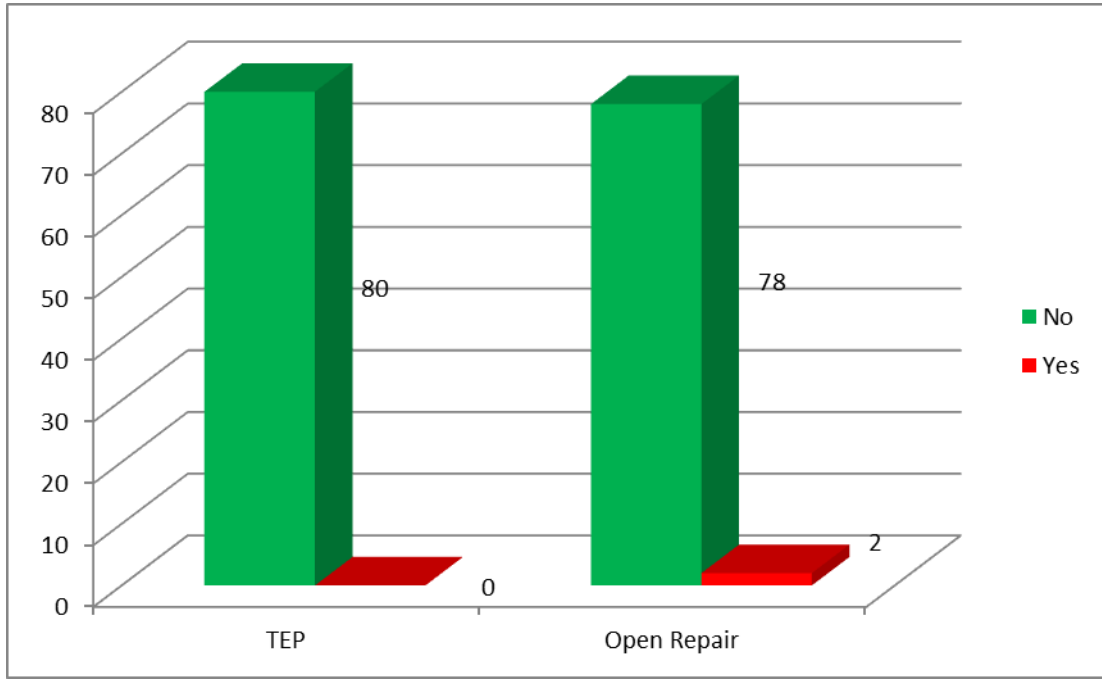
Average hospital stay in days

Hospital Stay	Group A	Group B
Average number of days	2.5	3



Recurrence

Recurrence	Group A	%age	Group B	%age
Yes	0	0	02	2.5
No	80	100	78	97.5
Total	80	100	80	100



Return to normal activity	
Procedure	No of days to normal work
TEP	07-10 days
Open repair	2 weeks and above

TEP was found to be slightly costly compared to open hernia repair.

DISCUSSION

The aim of any hernia repair includes decreasing the intraoperative and postoperative complications, achieving effective repair, lowest possible recurrence, rapid return to normal life, cost effectiveness and better cosmetic results. To accomplish all these results, various methods of inguinal hernia repair are in vogue. Open repairs of hernia are being performed worldwide in all general surgery departments. The development of laparoscopic techniques has revolutionized hernia repairs.

Lichtenstein introduced the open mesh repair in 1980 with his “Tension Free” hernioplasty technique. He also advocated the use of polypropylene mesh plugs for the anterior, infra-inguinal repair of femoral hernias.

Arregui and colleagues in 1993 introduced the trans-abdominal preperitoneal prosthetic (TAPP) procedure. [5] In 1993, McKernan and Laws described the totally extraperitoneal prosthetic (TEP) repair. The laparoscopic TEP repair involves creation of a potential space between the peritoneum and the transversalis fascia, also

referred to as the preperitoneal space of Bogros. [5] This helps a prosthetic mesh to be placed into the preperitoneal space so that the hernia is repaired posteriorly. [6]

The present study was conducted in the Department of General Surgery, Hamdard Institute of Medical Sciences and Research, New Delhi, 110062, over a time period of 2 years with mean follow up of 6 months. 80 patients were operated by open technique and 80 patients by laparoscopic TEP technique.

Interestingly, we didn’t have any female patient in our study and all of them were men in the age group of 20 to 60 years and above, with a mean age of 49 years in group A and 53 years in group B. The mean age in a study conducted by Malik AM et al was 40.27 years with a standard deviation of 9.724 and a range of 38 (20-58). [7] All patients in our study had unilateral inguinal hernia. In our study, postoperative pain as assessed by individual patient need for analgesia was slightly found to be higher in group B (7.5%) than group A patients (2.5%). This is in accordance with the first randomised controlled trial conducted by Stoker et

al. on hernia repair, which compared laparoscopic mesh repair with open repairs. In this study, laparoscopic repair was found to be less painful than open repair. [8] Since then, several randomised controlled studies and systematic reviews have largely confirmed these results. [9, 10] Postoperative urinary retention was found to be lower in group A (2.5%) compared to group B (7.5%). Jain et al. in their study laparoscopic versus open inguinal hernia repair reported a rate of urinary retention to the tune of 6.3%. In open group they reported the rate of 1.7%. [11] Vidovec et al reported a higher rate of urinary retention after TEP which was successfully managed by catheter drainage. [13] Shah et al, in their study reported a rate of 5% in laparoscopic group and 10% in open hernia group. [13] In our study, we found a higher rate of urinary retention in open hernia group probably because of most of these patients were in older age group and most of the cases in open hernia group were done under spinal anaesthesia. We managed this complication by bedside small calibre urinary catheterization under all aseptic conditions and precautions.

In our study 2 patients (2.5%) in group A developed postoperative seroma and same complication was found in 6 patients (7.5%) of group B. This was managed by simple needle aspiration under ultrasound guidance. In 05 patients seroma resolved by conservative management and observation only. Chalkoo M et al, reported seroma formation rate of 4.62% in their study of TEP repair. [14] Furthermore, Zeineldin found seroma in 6% of patients. [15] In a study conducted by Shah et al, they found 0% seroma formation in laparoscopic group and 6.6% seroma formation in open group. [13]

Hernia repair is said to be a clean surgery, therefore most of the centres do not recommend routine antibiotic prophylaxis. However as our centre mostly caters to rural population with poor personal hygiene, we made it a policy in our study to administer a single dose of preoperative prophylactic antibiotic. Our study found a superficial wound infection rate of 1.25% and 5% in groups A and B respectively. This was comparable with the study conducted by Shah et al. [13]

The average hospital stay in our study was 2.5 days in group A and 3 days in open hernia group. The postoperative stay in the hospital was almost

comparable in both groups. Cochrane review also reported that the length of hospital stay did not differ between open and laparoscopy groups (WMD-0.04 days, 95% CI -0.08 to 0.00; p=0.05). [16]

Hernia recurrence is one of the most important end result which determines the efficacy of a particular procedure. Our study found a higher recurrence rate in group B than group A. The recurrence rate in group A and group B was 0% and 2.5% respectively. This is comparable with the rates published in literature globally. MRC laparoscopic hernia trial group found 1.9% recurrence rate in laparoscopic group and zero percent recurrence rates in open group at one year. [17] This study involved 928 patients with groin hernias from 26 hospitals in UK and Ireland. Champault et al found recurrence rate of 6% in laparoscopic group versus 3% in open group in a series of 100 patients in a randomized trial. [18] VA trial concluded in 2004 involving 2164 patients in 14 centres in USA measured recurrence of hernia at two years as the primary outcome. Recurrence was found to be 10.1% in the laparoscopic group and 4.1% for open group in the repair of primary inguinal hernias, but rates of recurrence were similar in two groups after repair of recurrent hernias (10% and 14.1% respectively). [19] Return to normal activity was found to be earlier in case of group A (7-10 days) than group B (2 weeks and above).

In our study we found laparoscopic repair to be slightly costlier than open hernia repair. This is probably because of the difference in anaesthesia in laparoscopic and open hernia groups. Further the addition of tackers for mesh fixation added to the cost in laparoscopic repairs, which could be brought down in future by elimination of tackers.

CONCLUSION

Our study concluded that, laparoscopic TEP repair is a safe and viable option in expert hands for the repair of uncomplicated inguinal hernias. Although slightly costly, laparoscopic hernia repair has comparable results with open hernia repair with fewer general complications. With time, the recurrence rate of TEP is decreasing. The major drawback with laparoscopic TEP repair is its long learning curve, however in experienced hands TEP is better for uncomplicated inguinal

hernias in comparison to pain, infection, number of days in hospital, recurrence and return to normal

activity. The cost of TEP repair could be brought down by elimination of tackers.

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How to cite this article: Mohammad Mohsin, Tajamul Rashid. Prospective study of laparoscopic totally extraperitoneal repair (TEP) & open mesh hernioplasty. *Int J of Allied Med Sci and Clin Res* 2018; 6(1): 09-16.

Source of Support: Nil. **Conflict of Interest:** None declared.