



ORIGINAL RESEARCH PAPER

General Surgery

A COMPARATIVE STUDY BETWEEN OPEN LICHTENSTEIN MESH REPAIR AND LAPAROSCOPIC TOTALLY EXTRA PERITONEAL REPAIR OF INGUINAL HERNIA IN A TERTIARY CARE INSTITUTE

KEY WORDS: Inguinal Hernia, Open Lichtenstein Mesh Repair, Totally Extra Peritoneal Repair.

Dr Ameet Bhasme

Affiliation: Department of surgery, Dr.Panjabrao Deshmukh medical memorial college, Amravati, Maharashtra, India.

Dr Yogendra P Chidrawar*

Affiliation: Department of surgery, Dr.Panjabrao Deshmukh medical memorial college, Amravati, Maharashtra, India. *Corresponding Author

ABSTRACT

Background : The study was conducted to compare and assess the duration of procedure, complications encountered, post-operative pain and recovery, duration of hospital stay, and time taken in resumption to work between two techniques of open Lichtenstein mesh repair (OLMR) and Totally extra peritoneal (TEP) repair.

Methods: A cross sectional comparative study was conducted among 60 patients admitted for surgical repair of hernia. After considering the inclusion and exclusion criteria, the subjects were randomly assigned to the groups of OLMR and TEP and were assessed for pain in the post-operative period was rated using a Visual Analogue Scale. Total duration of the procedure, complications, duration of hospital stay, and time taken in resumption to work were elicited between two techniques.

Results: The mean duration of surgery among the study participants in TEP (51.6 mins) group was significantly higher compared to OLMR (44.1 mins) group. The median of post-operative pain scores in TEP group was significantly lower compared to OLMR group. The mean duration of post-operative recovery time, for resumption to work (4 days) among the study participants in TEP group was significantly lower compared to OLMR (9 days). The complications were significantly higher among the OLMR group compared to the TEP group.

Conclusions: Though the procedure of TEP repair for inguinal hernia takes a little longer time and complications of general anesthesia cannot be ruled out, it is a better procedure compared to open type.

INTRODUCTION

Inguinal hernias constitute the most common form of abdominal wall hernias. The incidence of inguinal hernia remains indefinite; however, nearly about 500,000 cases come to medical attention each year. Twenty or more years ago, international and US surveys were conducted, wherein, the non-surgically treated inguinal hernia prevailed among 5% of men and similarly, same number of men had history of hernia repair [1]. The lifetime risk of inguinal hernia is estimated to be 27% and 3% for men and women respectively [2]. The lack of consensus in the literature as to the optimum repair technique or prosthetic mesh to insure a long term durable result is also surprising [3, 4].

The wide use of mesh in the groin hernia repair has gained more popularity and has almost replaced the suture repairs such as shouldice or maloney repair [5,6]. There is, however, a very large debate on relative merits of laparoscopic mesh placement by using two to three small abdominal incisions compared with placement of mesh by using an open approach through a standard groin incision. Studies mentioned that laparoscopic hernia repair has got added benefits of lesser pain, reduced discomfort, short hospital stay and early resumption of normal daily activities but still it is not being commonly performed due to need for general anaesthesia and long learning curve. In this context, the purpose of this study is to compare the most commonly practiced methods namely Lichtenstein's hernioplasty and laparoscopic hernia repair in the hospital. The use of endo-laparoscopic surgery for inguinal hernias differs globally, constituting from 0% to 55% of repairs in some high resource countries. The average use in most countries is unknown, but then the rates recorded in Australia, Switzerland and Sweden is 55%, 45% and 28% respectively. Sweden in its national registry has noted the rates of surgeries being 64% Lichtenstein, 25% TEP, 3% TAPP, 2.7% combined open and preperitoneal and 0.8% tissue repair. Other registry revealed that between 2009 and 2016 an extensive variety of hernia repair techniques were in practise, including 39.0% TAPP, 25.0% TEP, 24.0% Lichtenstein, 3.0% plug, 2.6% Shouldice, 2.5% Gilbert prolene hernia system and 0.2% Bassini. The reliable data from Asia and the United States are still deficient [7].

Thus, this background indicates that there is a paucity of data

with respect to the endoscopic repairs is concerned in addition to the lack of data on comparing and contrasting both techniques especially in the low resource settings like India.

Hence the study was conducted to compare results of open Lichtenstein mesh repair and Totally extra peritoneal (TEP) repair, in an effort to determine the proposed advantages of one over the other. The Objectives of the present study were to compare and assess the outcome in terms of duration of procedure, complications encountered, post-operative pain, Hospital stay and resumption to work between open lichtenstein mesh repair and Totally extra-peritoneal repair of inguinal hernia.

METHODS

Present study is a non-randomized comparative study. The study consisted 60 patients treated with hernioplasty (30 cases of laparoscopic hernioplasty and 30 cases of open hernioplasty) in the Department of General Surgery, during the study period of one year. Written consent taken from all the cases.

Inclusion criteria

All patients of both sex, who were 18 years of age or older with a diagnosis of inguinal hernia, either bilateral or unilateral and were medically fit to undergo the procedure were included in the study.

Exclusion criteria

Patients with age less than 18 years of age, contraindication to general anaesthesia (for laparoscopic repair) / Regional anaesthesia (for open repair), patients with complicated inguinal hernia like obstruction, strangulation or gangrene. Patients who have undergone previous lower abdominal surgeries.

Data were collected using a questionnaire. Preoperatively the patients were offered options of either laparoscopic repair or open Lichtenstein's repair for inguinal hernia, and were educated about the advantages, disadvantages and type of anesthesia. Preoperative evaluation of patient for laparoscopic repair includes: cardiac evaluation such as 2D

ECHO if required. Pulmonary function test (PFT) for assessment of pulmonary function in some patients, and ultrasonography to rule out prostate enlargement.

If the patient is not fit for general anesthesia, laparoscopic repair is not advised, and patient is advised to go for open Lichtenstein's repair. Operative steps and per operative complications were noted in detail and tabulated.

Post-operative assessment with respect to post-operative pain, hospital stay, and other complications were included as per protocol. Patients were followed up for a period of minimum six months after surgery. That is one week after surgery, once in a month for 3 months, and once in three months thereafter. At the end of the study comparison was made between open Lichtenstein's repair and laparoscopic repair regarding safety and efficacy, duration of surgery with hospital stay and cost effectiveness, postoperative morbidity and patient satisfaction.

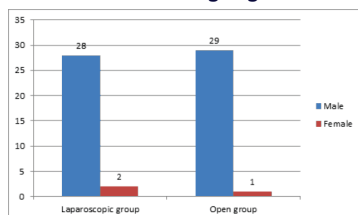
RESULTS

This study included 60 patients among which 30 patients (50%) were placed in group A (laparoscopic group) and 30 patients (50%) were placed in group B (Open Lichtenstein's repair). Table 1 shows gender distribution of the patients, both groups A and B had mostly male patients and only three female cases were noted.

Table 1 : Distribution according to gender

Gender	Laparoscopic group	Open group
Male	28	29
Female	2	1

Graph 1 : Distribution according to gender

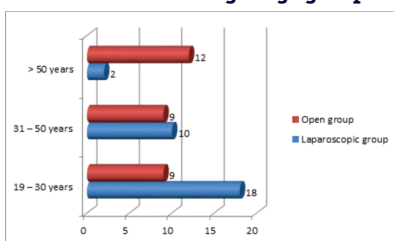


In our study maximum patients are in age group of 19 – 30 years (27 patients). The mean age in our study is 41.5 years.

Table 2 : Distribution according to age group

Age group	Laparoscopic group	Open group
19 – 30 years	18	9
31 – 50 years	10	9
> 50 years	2	12

Graph 2 : Distribution according to age group



All laparoscopic group operated under general anesthesia and all open group operated under spinal anesthesia.

Table 3: Comparison of outcomes of two techniques

Particulars	Laparoscopic group (mean)	Open group (mean)
Duration of procedure (Mins)	51.6	44.1
Duration of hospital stay in post operative period (Days)	2	5

Time taken for resumption to work (Days)	4	9
--	---	---

Duration of hospital stay in post operative period is less in laparoscopic group as compare to open group. Time taken for resumption to work is also less in laparoscopic group as compare to open group.

The median of post-operative pain scores in TEP group was significantly lower (3) compared to open mesh repair group (6).

Table 4: Comparison of rated post-operative pain scores between two techniques.

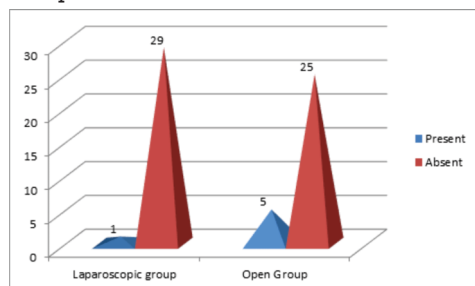
	Laparoscopic group	Open Group
Pain score (Median out of 10)	3	6

Among the study population, who developed complications, most of them (5) belonged to open mesh repair group and the complications were significantly higher among the open mesh repair group compared to the TEP group.

Table 5 : Association of complications of per-operative and post-operative complications among the two different types of hernia repairs.

Complications	Laparoscopic group	Open Group
Present	1	5
Absent	29	25

Graph 5 : Association of complications of per-operative and post-operative complications among the two different types of hernia repairs.



DISCUSSION

Inguinal hernia is commonly encountered pathological problem by the surgeon in the surgical practice. There are various methods for inguinal hernia repair, but 'Tension-free repair' is the procedure of choice. These tension-free repair procedures can be roughly categorized into two groups; laparoscopic and open anterior approach [8]. Ideal technique for effective inguinal hernia repair is still controversial. Although open tension free mesh techniques of inguinal hernia repair offers good results but the superiority of laparoscopic technique was reported for postoperative pain, discomfort and earlier return back to work [9]. Neumayer L et al., has reported the mean age of the patients in open mesh repair group and laparoscopic repair groups as 58.4+12.7 years and 58.6+12.8 years respectively and are in parallel to the current study [10]. Hanza Y et al., noted no significant difference in age between the two groups indicating that the two groups are comparable and are similar to our study. 13 Gokalp A et al., also noted all the study subjects as males similar to this study [9].

The mean duration of surgery among the study participants in TEP (51.6 mins) group was significantly higher compared to open mesh repair (44.1 mins) group similarly Bringman S et al., recorded mean operative time of 50 minutes which was significantly higher in TEP group as compared to 45 minutes in the Lichtenstein group [11]. All the study subjects in Open mesh repair group had higher (5 days) duration of hospital stay post-operatively however, majority in TEP group had lesser duration (2 days) of hospital stay post-operatively which is similar to the findings of Momin RS et al., where the

average duration of hospital stay in Open Hernioplasty was 3.5 days (1 to 15 days) which is higher than the TEP group which was 1.5 days (1 to 7 days) [12]. The mean duration of time taken for resumption to work among the study participants in TEP (4 days) group was significantly lower compared to open mesh repair (9 days) group which is similar to study by Kouhia ST et al., who found that postoperatively, the TEP group returned to work earlier (14.8 versus 17.9 days, respectively) compared to Lichtenstein group [13]. In another study by Andersson B et al., patients in the TEP group returned to work earlier and had a shorter time to full recovery [14].

The mean duration of post-operative recovery time among the study participants in TEP group was significantly lower compared to open mesh repair group which is similar to the findings by Bringman S et al [11]. The complications were significantly higher among the open mesh repair group compared to the TEP group. According to the meta-analysis conducted by Karthikesalingam A et al, there was no significant difference in the rate of seroma or haematoma formation between the two groups [15]. Similarly in a study by Sharma A and Chelawat P noted no difference in the intra-operative or post-operative complications between the groups of endo-laparoscopic procedure and open mesh repair type for primary inguinal hernias in men. The observed difference may be due to the different study settings and demography constituting the population [16].

CONCLUSION

Though the procedure of totally extra peritoneal repair for inguinal hernia takes a little longer time and complications of general anaesthesia cannot be ruled out, it is a better procedure in all other parameters viz., lesser rated pain scores, minimal post-operative recovery time, and early resumption to work with no recorded per-operative or post-operative complications.

Acknowledgement: none
Conflict of interest: none
Funding: none

REFERENCES

1. Everhart JE. Abdominal wall hernia. In: Everhart JE, ed. Digestive diseases in the United States: epidemiology and impact. Bethesda, MD: National Institute of Diabetes and Digestive and Kidney Diseases. 1994:471-507.
2. Jenkins JT, O'Dwyer PJ. Inguinal hernias. *BMJ*. 2008;336(7638):269-72.
3. Bittner R, Arregui ME, Bisgaard T. Guidelines for laparoscopic (TAPP) and endoscopic (TEP) treatment of inguinal Hernia. *Surg Endosc*. 2011;25:2773-843.
4. Treadwell J, Tipton K, Oyesanmi. Surgical options for inguinal hernia: comparative effectiveness review. Comparative effectiveness review. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm. Accessed August, 2015
5. McNally MP, Byrd KA, Duncan JE, Shepps CD. Laparoscopic versus open inguinal hernia repair: expeditionary medical facility Kuwait experience. *Military medicine*. 2009 Dec 1;174(12):1320-3.
6. Mahesh GS. Laparoscopic Versus Open Mesh Repair for Inguinal Hernia. *Indian Journal of Research*. 2015;11:104-6.
7. F. Mayer, M. Lechner, D. Adolf, D. Öfner, G. Köhler, R. Fortelny, et al. Is the age of >65 years a risk factor for endoscopic treatment of primary inguinal hernia? Analysis of 24,571 patients from the Herniated Registry. *Surg Endosc*. 2016;30:296-306.
8. Gokalp A, Inal M, Maralcan G, Baskonus I. A prospective randomized study of Lichtenstein open tension-free versus laparoscopic totally extraperitoneal techniques for inguinal hernia repair. *Acta chirurgica Belgica*. 2003;103(5):502-6.
9. Neumayer L, Giobbie-Hurder A, Jonasson O, Fitzgibbons RJr, Dunlop D, Gibbs J, et al. Open versus laparoscopic mesh repair of inguinal hernia. *N Engl J Med*. 2004;350(18):1819-27.
10. Hamza Y, Gabr E, Hammadi H, Khalil R. Four-arm randomized trial comparing laparoscopic and open hernia repairs. *Int J Surg*. 2010;8(1):25-28
11. Bringman S, Ramel S, Heikkinen T, Englund T, Westman B, Anderberg B, et al. Tension free inguinal hernia repair. TEP versus mesh plug versus Lichtenstein. A Prospective Randomized Controlled Trial. *Ann Surg*. 2003;237(1):142-7.
12. Momin RS, Hussain S, Quadri S. Laparoscopic TEP versus open hernioplasty: a comparative study of extraperitoneal tension free mesh repairs in inguinal hernia. *JEMDS*. 2015;4(72):12493-8.
13. Kouhia ST, Huttunen R, Silvasti SO, Heiskanen JT, Ahtola H, Uotila-Nieminen M. et al. Lichtenstein hernioplasty versus totally extraperitoneal laparoscopic hernioplasty in treatment of recurrent inguinal hernia--a prospective randomized trial. *Ann Surg*. 2009;249(3):384-7.
14. Andersson B, Hallén M, Leveau P, Bergenfelz A, Westerdahl J. Laparoscopic extraperitoneal inguinal hernia repair versus open mesh repair: a

prospective randomized controlled trial. *Surgery*. 2003 31;133(5):464-72.

15. Karthikesalingam A, Markar SR, Holt PJ, Praseedom RK. Meta-analysis of randomized controlled trials comparing laparoscopic with open mesh repair of recurrent inguinal hernia. *Br J Surg*. 2010;97(1):4-11.
16. Sharma A, Chelawat P. Endo-laparoscopic inguinal hernia repair: What is its role?. *Asian J Endosc Surg*. 2017;10(2):111-8.