

COMPARISON OF LICHTESTEIN OPEN TENSION-FREE VERSUS LAPROSCOPIC TOTALLY EXTRAPERITONEAL TECHNIQUE FOR INGUINAL HERNIA REPAIR

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ABSTRACT

Objectives: The study aimed to assess and compare Lichtenstein's open tension-free and laparoscopic totally extraperitoneal (TEP) mesh repair.

Methods: This hospital-based comparative type of observational study was conducted on 50 cases for each of two groups at upgraded Department of General Surgery, SMS Hospital, Jaipur, between January 2014 and January 2016. All the cases of elective inguinal hernia coming to SMS outpatient department in a single surgical unit operated by a single surgeon in the given period which meet the inclusion and exclusion criteria. Thus, collected data were entered in Microsoft Excel sheet and analysis was done by Epi info software of CDC.

Results: Total 100 patients were included in this study; 50 each in the two groups, the laparoscopic TEP group and open Lichtenstein group. Mean age in the laparoscopic group was 39.54 years and the open Lichtenstein group was 42.78 years. The mean pain score out of 10 at 24 h was 2.96 (± 0.638) and 3.60 (± 0.969) in TEP and Lichtenstein groups, respectively. The mean return to work for open group was 17.00 and TEP group was 11.34 days. There is no any recurrence and readmission in both groups.

Conclusion: Laparoscopic TEP repair may be done in all uncomplicated inguinal hernia by an experienced surgeon for those desiring less pain, better cosmetic results, less post-operative complications, less hospital stay, and early return to work.

Keywords: Hernia, Laparoscopic totally extraperitoneal, Lichtenstein.

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INTRODUCTION

A hernia is defined as an abnormal protrusion of an organ or tissue through a defect in its surrounding walls. The cause of an inguinal hernia is far from completely understood but it is undoubtedly multifactorial. It is estimated that 25% of men and 2% of women develop inguinal hernia during their lifetime. Patent processus vaginalis, increase intra-abdominal pressure, and relative weakness of the posterior inguinal wall are some of the factors associated with inguinal hernia occurrence. Inguinal hernia repair is one of the most frequently performed operations worldwide [1].

In 1984, Lichtenstein coined that the term "tension-free repair" came into vogue and was routinely advocated and aggressively repair with open inguinal hernia repair was eligible for inclusion. It gives a better result than a conventional sutured repair. Overall recurrence rate is decreased along with shorter hospital stay, faster return to normal activities, and a lower incidence of persisting pain [2].

The preperitoneal placement of mesh that was popularized by Nyhus and Codon has been considered a more physiological, safe, and secure technique of groin hernia repair. The laparoscopic hernioplasty has several advantages over its open counterparts as evidenced by several studies. Now totally extraperitoneal (TEP) is considered as the standard laparoscopic hernia repair [3].

The issue of indications for laparoscopic inguinal hernioplasty remains unsettled and awaits the results of several large randomized trials. Prospective randomized controlled studies between laparoscopic inguinal hernioplasty and tension-free open mesh hernioplasty have been coming out with results since the procedure began [4].

In India, there is a need to conduct more studies to examine the results of laparoscopic hernia surgery in comparison to the most popular open Lichtenstein hernioplasty, to establish standard guidelines and compare the results with Western literature. The present study is being undertaken to evaluate these aspects in our setting.

The aim of this study is to assess and compare Lichtenstein's open tension-free and laparoscopic TEP mesh repair in relation to:

- Operative time
- Intraoperative complications
- Post-operative pain and neuralgia
- Duration of nothing by mouth
- Post-operative hospital stay
- Time required for return to work
- Hernia recurrence.

METHODS

This hospital-based comparative type of observational study was conducted on 50 cases for each of two groups at upgraded Department of General surgery, SMS Hospital, Jaipur, between January 2014 and January 2016.

All the cases of elective inguinal hernia coming to SMS outpatient department (OPD) in a single surgical unit operated by a single surgeon in the given period which meets the inclusion and exclusion criteria.

Inclusion criteria

All the cases with a diagnosis of inguinal hernia willing to participate follow-up for 3 months and give written informed consent, coming to SMS OPD in our surgical unit operated by a single surgeon.

Exclusion criteria

- Patients not willing to participate in follow-up
- Pregnancy
- Patient on anticoagulants and other bleeding disorder
- Any emergency surgery will be excluded from the study, for example, peritonitis, strangulated, incarcerated, and obstructed inguinal hernias
- Patients unsuitable for general anesthesia
- Patients with large, complete, indirect inguinal hernia which were only partially reducible or irreducible (SGRH classification Grade V groin hernia)
- Prior groin irradiation or other inflammatory process.

Statistical analysis

Thus, collected data were entered in Microsoft Excel sheet and analysis was done by Epi info software of CDC.

RESULTS

Total 100 patients were included in this study; 50 each in the two groups, the Laparoscopic TEP group and open Lichtenstein group. Ninety-nine patients were male and one female. The patients were in the age group of 15–76 years. Mean age in the Laparoscopic group was 39.54 years and the open Lichtenstein group was 42.78 years. There was no significant difference in the mean age in the two groups on statistical analysis so they are comparable (Table 1).

Majority of the patients had right-sided inguinal hernia 49%, 52% in TEP group, and 46% in the open Lichtenstein group. Overall right side more common than B/L and lowest is left-sided in this study. In TEP group, 32% bilateral (B/L) and 16% left-sided. In open 28% B/L and 26% left-sided (Table 2).

The mean operative time of laparoscopic TEP repair was 87.90 min with S.D of ±26.23. The mean operative time of open Lichtenstein repair was 55.54 min with S.D of ±16.37 (Fig. 1).

The operative time was noted in each case from the time of first incision to the last skin stitch applied. The mean operative time of laparoscopic TEP repair was 87.90 min with S.D of ±26.23. The mean operative time of open Lichtenstein repair was 55.54 min with S.D of ±16.37 (p<0.001) (Table 3).

Table 1: Age profile of study subjects

Age	Groups		Total
	TEP	Lichtestein mesh repair	
<20	4	3	7
21–30	15	6	21
31–40	10	10	20
41–50	8	6	14
51–60	6	6	12
61–70	5	11	16
>70	2	8	10
Mean±SD	39.54±15.98	42.78±17.25	0.451

SD: Standard deviation, TEP: Totally extraperitoneal

Table 2: Side of hernia operated in each group

Side of hernia	Groups		Total
	TEP	Lichtestein mesh repair	
Right	26	23	49
Left	8	13	21
Bilateral	16	14	30
Type of hernia			
Direct	19	21	40
Indirect	31	29	60

TEP: Totally extraperitoneal

The postoperative pain was recorded at 24 h, 72 h, 1st week, and 2nd week after operation using visual analog scale (VAS) pain scoring system. The mean pain score out of 10 at 24 h was 2.96 (±0.638) and 3.60 (±0.969) in TEP and Lichtenstein groups, respectively. The mean pain score of TEP and Lichtenstein repair at 72 h was 1.88 and 2.30, respectively.

All patients in TEP group were operated under general anesthesia. In contrast, majority of Lichtenstein group 45 were operated under spinal block, four under local anesthesia, and one under general anaesthesia. There was no conversion from TEP to open Lichtenstein repair.

There were 5 cases (10%) of nausea in each group. Seven cases (14%) of seroma formation in the open Lichtenstein group were detected on 5 post-operative days. There was no one case in both groups which has incision site infection. In Lichtenstein group, 5 cases (10%) had post-operative urinary retention whereas no cases were seen in TEP group.

In TEP group, 49 cases are discharged on day 2 with mean hospital stay was 2.02 days. In open group, 29 patients (58%) were discharged on day 2, 8 cases (16%) were discharged on day 1, one case on day 11, two cases on day 7. Mean hospital stay was 2.54 days. There is a significant difference in antibiotic intake in between two groups which is required more for Lichtenstein group. Return of bowel function was earlier in TEP group than open group. Mean for TEP is 2.12 days and in Lichtenstein group is 2.38 days (Table 4).

The patients were instructed to return to work when they feel after discharge from the hospital. They were to report the day of joining work when called for follow-up. The mean return to work for open group was 17.00 and TEP group was 11.34 days. There is no any recurrence and readmission in both groups (Table 4).

DISCUSSION

The present study was carried out on 100 patients admitted in surgical Unit III, Department of Surgery, Swai Man Singh Medical College and Hospital, Jaipur, with the clinical diagnosis of inguinal hernia from January 2014 to January 2016. The patients were randomized into two groups on admission to the indoor wards by systemic random sampling, that is, one into Laparoscopic TEP group and another into open Lichtenstein group. All the patients in both groups were male except one female in TEP group. The mean age of patients in the laparoscopic TEP group was 39.54 years and was less than the age in Lichtenstein group, that is, 42.78 years.

The mean operative time of TEP repair was 87.90 min (range). This was significantly longer than the operative time for open Lichtenstein repair (mean, range). Similarly, mean operative time in series by Suter M was 81 (±27) min and Suter and Martinet. 82 min [5].

Table 3: Visual analog scale

Vas score	TEP	Lichtestein mesh repair	p-value
AT 24 h	2.96±0.638	3.60±0.969	<0.001**
AT 72 h	1.88±0.480	2.30±0.614	<0.001**
1 week	0.44±0.577	1.06±0.978	<0.001**
2 nd week	0.02±0.141	0.36±0.598	<0.001**

TEP: Totally extraperitoneal, **Highly significant

Table 4: Outcome parameters among study subjects

Outcome parameters	TEP	Lichtestein mesh repair	p-value
Length of hospital stay	2.02±0.141	2.54±1.775	0.042**
Parenteral antibiotic	0.24±0.476	1.14±1.59	<0.001**
Return to bowel function	2.12±0.328	2.38±0.567	0.006*
Return to work	11.34±1.996	17.00±3.482	<0.001*

TEP: Totally extraperitoneal, **Highly significant, *Significant

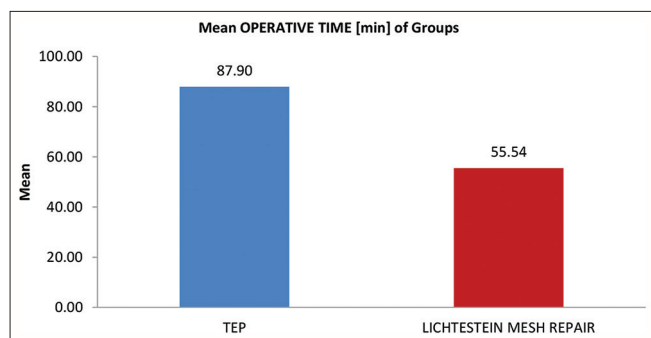


Fig. 1: Mean operative time among study subjects

There were no conversions of Laparoscopic TEP repair to open Lichtenstein repair (0%), which is equal or lower than any published series because of the experienced surgeon. Lal *et al.* [6] and Lau *et al.* [7] reported conversion rate at 0%.

Post-operative pain was recorded using VAS pain scoring systems. The mean pain score was significantly low in TEP group as compared to Lichtenstein group in all readings up to 2-week postoperatively. This is consistent with the findings of other randomized studies. Lal *et al.* had significant difference in pain scores after 12 and 24 h but not thereafter, which was similar to results of Liem *et al.* [8].

In the TEP group, seroma formation in the inguinoscrotal region was nil. In open group, seroma is present in 7 (14%) cases. This was probably due to extensive dissection of the space, rough handling of cord and intraoperative oozing. The patients presented with painless irreducible swelling in scrotum or inguinal region, diagnosed clinically. Patients were anxious because of swelling. They were reassured and given anti-inflammatory medication for 5–7 days. All resolved conservatively at various time periods. Lal *et al.* reported 12% incidence of seroma and advocated compression dressing over hernia site with dyanaplast to reduce seroma formation. The seroma formation in our study was higher in comparison to Kald *et al.* (2%) [9].

Post-operative numbness/paresthesia was seen in no one case in TEP group but in 1 (2%) case of Lichtenstein group. Lal *et al.* reported 8% incidence of neuralgia in TEP group and Kuhry E 1.1%. This is reported in various studies to be a cause of long-term morbidity and lower quality of life in open repairs [10].

Hematoma presented as a firmer swelling which took longer to resolve. It occurred in one case in the inguinal region in open group. All resolved conservatively. Lal *et al.* reported no incidence of hematoma formation in TEP and 8% in Lichtenstein group.

Pneumoscrotum was reported as a complication of TEP repair in the study by Lal *et al.* at 16% incidence which resolved within 3 h of surgery.

Post-operative hospital stay was significantly low in TEP group. Lal *et al.*, Kuhry E and Andersson *et al.* show no significant difference in hospital stay but other studies showed significantly lesser hospital stay in TEP repair cases. These results may be explained by the fact that patients catheter was removed on the same day after 3–4 h or next day with less pain, early mobilization, and early recovery and no major intraoperative and post-operative complications. Lal *et al.* reported that TEP group was electively kept under observation to watch for complications and so, the study did not show any difference in hospital stay between two groups.

Mean duration of return to work was longer in Lichtenstein group (17 days) than TEP group (11.34 days). which is significantly lower in TEP group. These can be explained by that less intraoperative and post-operative complications, early recovery, and most of are not government employ. Patients want early mobilization and early return to work

without any complication and pain because of many responsibilities, which is supported by Heikkinen *et al.* (12 vs. 17 days) [11].

Post-operative parental antibiotics requirement in TEP (mean POD 0.24) group is significantly lower than open (mean POD 1.14) group. In TEP group, it is required only on day 0 and 1 but it is more for open group. Reason for that is due to longer hospital stay and postoperative seroma and hematoma formation. It is given for the prevention of infection in these complications.

Most patients were satisfied about their surgery in TEP group but not all in open group because of complications and longer hospital stay. Lal *et al.* reported that 80% patient's were highly satisfied with the surgery and 100% with the cosmetic result in TEP group while the figure was 56% and 28%, respectively in the Lichtenstein group. Better cosmetic results and low complication rate is an advantage of using laparoscopic hernia repair particularly in young patients who desire better scars.

CONCLUSION

Laparoscopic TEP repair may be done in all uncomplicated inguinal hernia by an experienced surgeon for those desiring less pain, better cosmetic results, less post-operative complications, less hospital stay, and early return to work.

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AUTHOR'S CONTRIBUTION

All the authors have contributed equally.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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