

A Comparative Study between Laparoscopic Hernia Repair and Open Lichtenstein's Hernia Repair

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Abstract: This is a prospective study involving 50 cases of unilateral inguinal hernia admitted in Yenepoya Medical College, Mangalore, Karnataka, India, 25 of whom underwent open Lichtenstein's repair and the remaining, laparoscopic Total Extraperitoneal (TEP) Repair. The study deals with a comparison of the effectiveness of these two types of repair. 50 cases of unilateral inguinal hernia admitted in Yenepoya Medical College, Mangalore, were selected on the basis of convenience sampling method. Adults (>15 years) consenting for randomized trials and having either unilateral direct or indirect inguinal hernia were included. They were randomly chosen for Lichtenstein's or TEP repair and the results were compared on the basis of the following outcome measures :i) duration of operation (in mins), ii) post operative pain (in days), iii) length of hospital stay (in days), iv) post operative complications like haematoma, seroma, v) time to return to usual activities and vi) cost comparison. The outcomes were evaluated and compared with standard published literature. The mean duration of surgery for Lichtenstein's repair was 62.2 minutes whereas for TEP was 72.4 minutes. Duration of post operative pain was more (2.8 days) for open repair than 1.48 days for TEP repair; same being for post operative stay (5.12 days for Lichtenstein's repair and 2.6 for TEP). Time of returning to normal work was 43.72 days for Lichtenstein's repair and 25.6 days for TEP repair. However, TEP repair was approximately Rs 5000 more expensive and had more post operative complications. TEP repair, though expensive, is superior with regard to reduced post operative pain, reduced hospital stay and early return to normal activity, when compared to Lichtenstein's repair.

Keywords: TEP, Lichtenstein's, open vs lap hernia, Mesh hernia repair

1. Introduction

Of the study of the many operations available in a general surgeon's armamentarium, that of hernia repairs have been written about repeatedly [3]. The rapid changes that have been witnessed in open approach surgeries, prosthetic materials and laparoscopic surgeries have made hernia surgery, a most interesting field of endeavor that demands dedicated work and dedication [4]. A variety of procedures have been described in literature, and are being regularly practiced in institutions around the globe. However there has been no definite consensus about any one being the ideal procedure, as each procedure has its own set of complications, the most significant being recurrence.

In our institution, inguinal hernia repair is one of the most common surgeries performed. The procedures performed most commonly are open Lichtenstein's tension free repair and laparoscopic total extra peritoneal repair. This study aims to find which surgery, among these two, is more advantageous.

2. Objectives

- 1) To compare minimal access laparoscopic hernia surgery (Total Extraperitoneal Repair – TEP) with open Lichtenstein's repair on the basis of i) duration of operation (in mins), ii) post operative pain (in days), iii) length of hospital stay (in days), iv) post operative complications like haematoma, seroma, v) time to return to usual activities and vi) cost comparison.
- 2) To ascertain the number of conversions (defined as a procedure initiated as laparoscopic, but converted to open).

3. Methodology

The present study is a prospective study of fifty cases of unilateral inguinal hernia admitted in Yenepoya Medical College and Hospital, Deralakatte, Mangalore, India, during the study period of October 2012 to October 2014. i) The 50 cases were selected on the basis of convenience sampling method. ii) Both direct and indirect unilateral inguinal hernias were selected iii) After pre-operative preparation the patients were selected randomly for open (Lichtenstein's) or laparoscopic (TEP) repair

Types of Outcome Measures: a) Duration of operation (min) b) Conversion (defined as a procedure initiated as laparoscopic, but converted to open and vice versa) c) Haematoma d) Seroma e) Post operative pain f) Length of hospital stay (Days) g) Time to return to usual activities h) Cost comparison

Source of Data/ Sampling Method and Sample Size: 50 cases of unilateral direct or indirect inguinal hernia, adults, admitted to Yenepoya Medical College and Hospital, Mangalore, Karnataka, India. Out of these, 25 were chosen for Lichtenstein's Repair and the remaining 25 for Total Extraperitoneal Repair

Inclusion Criteria: Adults (>15 years) consenting for randomised trials. Unilateral Direct or Indirect Inguinal hernia

Exclusion Criteria: Congenital Hernias, Recurrent Hernias, Bilateral Inguinal Hernias, Obstructed Hernias, Large hernias, People with connective tissue disorders, Patients who have already had lower abdominal surgery, People who are not fit for GA – COPD, Bronchial Asthma etc. (ASA Gr > 3). All patients included in the study were evaluated with a thorough history and physical examination. Routine

investigations were done – blood investigations plus ultrasound abdomen and prostate specific antigen in the ones whom these were indicated. ECHO was done for the cardiac evaluation in some patients.

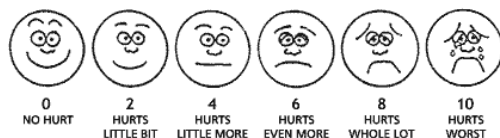
Preoperative treatment and preparation for surgery:

Correction of anaemia, Improvement of nutritional status . Treatment of respiratory infections, Breathing exercises, Abstinence from smoking / alcohol, Treatment of urological problems, constipation etc. Type of anaesthesia used was general anaesthesia in case of TEP repair and spinal anaesthesia in case of Lichtenstein's repair. A single dose of prophylactic preoperative antibiotic Cefazolin was given, with one dose post operatively. Analgesics were given post operatively. If epidural analgesia was given, the patient was kept on an NSAID SOS; or alternatively analgesics were given in an injectable form for the first day, and from the second day onwards converted to oral.

Post Operative Care and Complications

After surgery, all patients were observed carefully for pain, bleeding, urinary retention, wound infection. Pain was assessed using the universal pain assessment tool (Wong-Baker Facial Grimace Scale). Pain was assessed from 12 hours after the surgery, when the effect of either spinal or general anaesthesia would have worn away. For wound infection, discharge of pus from the operative site, abnormal tenderness at the operative site and associated constitutional symptoms like fever etc were looked for Figure 32: Wong Baker Scale. Subcutaneous haematoma was looked for. Seroma in the inguinal region was looked for

Wong-Baker FACES Pain Rating Scale



From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: *Wong's Essentials of Pediatric Nursing*, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

- Urinary retention was termed as inability to urinate spontaneously resulting in catheterization

Discharge: A careful note was kept as to the duration of the post operative pain and the patients were discharged when fit. Follow up was done first after 2 weeks, and checked from wound infection, persistent pain, difficulty in normal activity. Each patient was followed up until 6 months till they could return to normal work. The age, sex incidence, mode of presentation, precipitating factors, surgical treatment, post operative complications, cost of the treatment, hospital stay were all evaluated and compared with standard published literature.

Statistical Analysis: The results of the two types of hernia repairs against the specified outcome measures were analyzed with the following statistical methods: - Descriptive - Crosstabs - Chi-Square- Independent Samples T Test.

4. Observation and Results

In our study, the youngest participant was 23 years old and

the oldest was 75 years old. All participants were men. The youngest patient who underwent Lichtenstein's repair was 26 years old and the oldest was 68 years old. The youngest patient who underwent TEP repair was 23 years old and the oldest was 75 years old.

Mean Age and Standard Deviation (comparing cases who underwent Lichtenstein's Repair and TEP repair)

	Lichtenstein's repair	TEP repair
Mean Age (inyrs)	47.12	53.04
SD	13.0809	13.61825

The P value is more than 0.05, hence there is no relation between the ages of the patients and the procedure they underwent : Lichtenstein's repair and TEP repair.

Presenting Symptoms

Totally 20 patients presented with left sided inguinal hernia as compared to 30 right sided hernias.

Type of Hernia

Valid	Frequency	Percent
Direct inguinal Hernia	27	54
Indirect Inguinal Hernia	23	46
Total	50	100

Association of direct and indirect inguinal hernia patients with Lichtenstein's and TEP repair

Hernia	Open hernia	TEP	Total
Direct	11	16	27
Indirect	14	9	23
Total	25	25	50

P value is more than 0.05, hence it is not significant. There is no statistically significant biasing of a particular type of hernia towards a particular procedure.

Duration of symptoms

Valid	Frequency	Percentage
< 1 yr	22	44
>1 yr	28	56
Total	50	100

A higher number of patients presented with complaints for more than 1 year.

Association between smoking and incidence of hernia

	Direct hernia	Indirect hernia	Total
Smoker	19	9	28
Non-smoker	8	14	22
Total	27	23	50

P value is 0.03 (< 0.05), hence significant. This implies that smokers, in this study, had an increased incidence of direct inguinal hernia.

Precipitating factors

Valid	Frequency	Percent
Strenuous work only	23	46
Bronchial asthma only	2	4
BPH only	3	6
Constipation only	2	4
COPD only	1	2
Smoker only	11	22
More than one factor	8	16
Total	50	100

The most important precipitating factor was strenuous work, with isolated strenuous work accounting for 46% of the cases.

Duration of surgery in minutes

Type of Surgery	N	Mean(min)	SD
Lichtenstein's	25	62.2	13.9254
TEP	25	72.4	10.3199
Total	50		

P value is 0.005, hence significant. Hence there is an increase in the duration of repair of unilateral TEP repair compared to the Lichtenstein's repair. This may be attributed to the learning curve.

Duration of post operative pain in days

Surgery	N	Mean days	SD
Lichtenstein's	25	2.8	1.4434
TEP	25	1.48	0.6532
Total	50		

Duration of post operative pain (in days)

P value is <0.001, hence significant. Thus there is a definite reduction in the duration of post operative pain (in days) following a TEP repair than a Lichtenstein's repair.

Duration of post operative hospital stay (in days)

Surgery	N	Mean days	SD
Lichtenstein's	25	5.12	2.242
TEP	25	2.6	0.866
TOTAL	50		

P value is <0.001, hence significant. Hence patients who underwent Lichtenstein's repair stayed for a longer time in the hospital compared to those who underwent TEP repair.

Cost in Rupees

Surgery	N	Mean cost in Rupees	SD
Lichtenstein's	25	3500	640.31
TEP	25	8068	1074.99
Total	50		

P value is <0.001, hence significant. This implies that there is an increased expenditure associated with TEP repair compared to Lichtenstein's repair.

Complications

COMPLICATIONS			
Surgery	Hematoma	Seroma	Total
Lichtenstein's	-	-	-
TEP	-	2	2
TOTAL	-	2	

There were only two cases of seromas, in case of TEP repair.

Time interval of returning to normal work (in days)

Type of surgery	N	Mean time interval (in days) of returning to work	SD
Lichtenstein's repair	25	43.72	13.8
TEP	25	25.6	12.1
Total	50		

p value is less than 0.05, hence significant. Hence, patients

who have undergone TEP repair can go to normal work earlier than those who underwent Lichtenstein's repair.

5. Discussion

The subject of repair of inguinal hernia has been full of controversy ever since Eduardo Bassini of Padua University described his method of repair in the manuscript 'Radical Cure of Inguinal Hernias' way back in 1887. The fact that more than a hundred repairs have been described for inguinal hernia and practised at some time or the other over the past century are a testimony to the fact that none has been considered distinctly superior to the others. In recent years, however, the use of mesh for repair of inguinal hernia has become a norm. Reduction in the recurrence rate from more than 15% with tissue repairs to less than 1%, reduction in the postoperative pain and a shorter convalescence have all contributed to the popularity and widespread use of the tension-free mesh repairs. The laparoscopic repair of inguinal hernia, a relatively newer modality in the armamentarium of the surgeon, has been around for around two decades. Although perhaps not practised as widely as laparoscopic cholecystectomy is for gallstone disease, laparoscopic repair of inguinal hernia has established its rightful place in the surgical practice [48].

Out of the two types of laparoscopic hernia repair followed most commonly, TAPP and TEP, we have exclusively performed TEP repairs in our patients. In TAPP the surgeon goes into the peritoneal cavity and places a mesh through a peritoneal incision over possible hernia sites. TEP is different as the peritoneal cavity is not entered and mesh is used to seal the hernia from outside the thin membrane covering the organs in the abdomen (the peritoneum) [49].

6. Conclusion

The present study is a comparison of the effectiveness and complications of the Lichtenstein's tension free repair and the Total Extraperitoneal (TEP) Repair.

All the patients were carefully monitored from the time of admission till discharge, and the parameters pertaining to the study noted. We found that there is a marked reduction in post operative pain in laparoscopic hernia repair compared to hernioplasty. Post operative stay is less in TEP repair. Post operative return to work is earlier in TEP compared to Lichtenstein's repair- Laparoscopic hernia repair is quite expensive compared to hernioplasty. The patients have been followed up for noting any long term complications and also for the time taken to return to usual pre-hernia lifestyle. There were a few drop outs, people who failed to follow up.

There were a few limitations to the study; the Wong Baker scale to assess pain was subjective and does not bring into account the level of tolerances of different patients. All patients could not be followed up on a long term basis.

There is no universal repair for groin hernia and no two surgeons would disagree on that point. The availability of such an array of surgical techniques in the treatment of groin hernias is bound to confuse the younger surgeon. All techniques will have proponents as well as opponents. This

is where the practice of evidence based medicine is very crucial and one should closely follow up the long term results of the newer procedures.

TEP repair, though expensive, is superior with regard to reduced post operative pain, reduced hospital stay and early return to normal activity.

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