Original Research Article

Better to trans-abdominal preperitoneal hernias than open them: a comparative study in a rural setup

Robinson George^{1*}, Vivek S.², Suprej K.³

¹Department of General Surgery, ²Department of Preventive Medicine, ³Biostatistician, Al- Azhar Medical College, Ezhalloor, Thodupuzha, Idukki, Kerala, India

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*Correspondence:

Dr. Robinson George,

E-mail: docrg7@hotmail.com

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ABSTRACT

Background: Hernias are one of the most common anatomical derangements in men and women and has left an indelible mark throughout most of recorded history. The main aim of our study was to make a comparative assessment of the shortest duration of stay in hospital between 2 modalities of inguinal hernia repair namely; lap trans- abdominal preperitoneal (TAPP) and conventional lichtenstein repair.

Methods: The postoperative complications of pain and seroma were also assessed as secondary outcomes of the study. The study comprised of 200 patients randomly allocated, and followed up every 6 months for 4 years.

Results: TAPP repair was found to be better in terms of shorter duration of stay in hospital and few postoperative complications as evident from the p-value.

Conclusions: The study concluded that the duration of stay in hospital was the shortest in lap TAPP compared to conventional lichtenstein repair.

Keywords: Inguinal hernia, Hernia repair, Prolene mesh, Laparoscopy, Lichtenstein repair, TAPP

INTRODUCTION

Hernias are one of the most common anatomical derangements in men and women and have left an indelible mark throughout most of recorded history. The Egyptians (1500 BC), phoenicians (900 BC) and ancient greeks (400 BC) all describe the diagnosis of hernia and various methods of treatment. Surgical intervention is described in ancient scripture as well as demonstrated in sculpture and other forms of record. The mummified remains of the pharaohs merneptah (1215 BC) and Ramses V (1157 BC) suggest that both suffered from and were likely treated for groin (inguinal) hernia. The word hernia is derived from the Greek word hernios, a bud or shoot.

For hundreds of years various surgical and non-surgical treatments were offered to patients suffering from chronic pain, obstruction and strangulation related to their hernias. It wasn't until the mid-1700s, the so called age of dissection, when surgical anatomists began to appreciate and understand the complexity of inguinal (groin) anatomy. Over the next century the great pioneers of hernia surgery developed an understanding of the various forms of hernia and the nature of how and why the form. Understanding form and function was the first major step in finding a solution to the problem.

Inguinal hernia repair is probably the most common procedure performed in the department of surgery. Most of the time it is one of the first surgeries asked to be performed by a junior surgical resident. There are plenty of repair techniques described to date, however, tension-

free mesh repairs are most widely used methods at present, because of their low rate of recurrence.

Because of the high incidence of inguinal hernias, the repairs consume a large part of health care resources, estimating 20 millions of inguinal hernia repairs performed globally every year.¹ Any complications like recurrences, infections also add to the extra burden on the health resources. Therefore, knowledge of a current repair method is imperative in the practice of every surgeon. Approximately, 75% of all abdominal wall hernias are seen in the groin.¹ Inguinal hernia is found to be much more common in men than women. Although femoral and umbilical hernias are more common in female population, indirect inguinal hernia is still the most common type of hernia in women. Age is a factor for incidence and type of inguinal hernia; the incidence seems to increase by age.² Indirect hernias are found more commonly in young and direct in the elderly.

Traditionally, almost all inguinal swellings presumed to be hernias, are referred for surgical treatment following diagnosis. Since, with time these hernias progress in size, most of the surgeons prefer to operate them at the earliest given opportunity. It is a benign swelling and the repair results in few rare, but common complications. Nevertheless complications developed after emergency repairs may be more dramatic and frequent, even mortality may be recorded.^{3,4} Especially, in the case of elderly population.^{5,6} Hence, repair in an elective setting is generally recommended. There are also, few surgeons who adopt a wait and watch approach in slow, evolving, asymptomatic cases.⁷⁻⁹

At present, inguinal hernias can be treated with very low complication rates. There are various modalities of treatment namely; open repairs like Lichtenstein operation, shouldice technique, can be performed with local anesthesia in a safe and economic way.¹²⁻¹⁴ Laparoscopic repairs are new attractive options for patients, which has a drawback of being more expensive. So, most of the inguinal hernias are repaired unless the general condition is against it. This study was conducted in a rural medical college to compare the duration of stay in hospital and the rate of postoperative complications between TAPP repair and conventional Lichtenstein repair of inguinal hernia.

METHODS

This study consisted of 200 patients who were randomly allocated in 2 groups; one for TAPP and the other for Lichtenstein repair (100 each) after explaining the benefits and risks of both the procedures. The follow-up was conducted every 6 monthly. The patients were operated by a single surgeon trained in both conventional and lap TAPP repairs over a period of 4 years.

The inclusion criteria was diagnosed cases of inguinal hernia, ages from 20 to 90. The study was approved by

the Institutional Ethics Committee; written and informed consent was taken from all the patients. Exclusion criteria was ASA class IV and V, contraindications to general anesthesia, bowel obstruction, bowel strangulation, peritonitis, bowel perforation, local or systemic infection, contraindications to pelvic laparoscopy, a history of repair with mesh.

Open Lichtenstein repair was performed under spinal anesthesia; the mesh was prolene of size 15 X 7.5 cms. TAPP repair was performed under general anesthesia with a reverse trendelenburg position; the mesh was soft prolene of size 15 X 12 cms and held by metallic tacks (Coviedien).

Pain was assessed using visual analog scale. The duration of stay in hospital was calculated in days. The postoperative complications assessed were pain and collection of seroma.

Statistical analysis

Data were analyzed using SPSS 21.0 and graphs were depicted using Microsoft excel. Quantitative data were summarized as mean with standard deviation or median with interquartile range. Qualitative data were summarized as frequency with percentage and analyzed using Chi-square test. Quantitative data between the groups were compared using independent sample t-test or Mann-Whitney U-test. For all tests, a $P < 0.05$ was considered statistically significant.

RESULTS

The mean age was 45.14 years for lap TAPP repair and 63.52 years for open lichtenstein repair. There is a significant difference in the age between the 2 groups (p -value=0.000), probably indicating a preference to conventional repair by the older population. The youngest male and female patients were 21 years and 27 years respectively. The oldest male and female patients were 88 years and 68 years respectively. Independent t test was used to calculate.

Table 1: Age distribution of the patients.

Age	Mean± SD	P-value
Tapp	45.14±10.73	< 0.001
Open	63.52±11.45	

Table 2: Sex distribution of the patients.

Gender	Tapp	Open	P value
Male	90 (51.1%)	86 (48.9%)	0.384
Female	10 (41.7%)	14 (58.3%)	

Table 3: Type of hernia sac.

Diagnosis	Tapp	Open	P value
Direct	51 (39.2%)	79 (60.8%)	< 0.001
Indirect	41 (69.5%)	18 (30.5%)	
Both	08 (72.7%)	03 (27.3%)	

Table 4: Postoperative complications.

Complications	Tapp	Open	P value
Present	04 (4.0%)	95 (96.0%)	< 0.001
Absent	96 (95.0%)	05 (5.0%)	

Table 5: Duration of hospital stay.

Duration of stay	Median (IQR)	Mean	P value
Tapp	01	1.12	< 0.001
Open	04 (2)	3.89	

Table 6: Return to work.

Return to work	Median (IQR)	Mean	P value
Tapp	03	3.58	< 0.001
Open	15 (5)	19.26	

The majority of the patients were found to be predominantly male 176. Of these, 90 (51.1%) were operated by TAPP and 86 (48.9%) by Lichtenstein repair. Of the 24 females, only 10 (41.7%) were operated by TAPP and 14 (58.3%) by lichtenstein repair. Chi square test was used to calculate ($p=0.384$).

Of the 100 patients operated by TAPP repair: 51 (39.2%) had direct sacs, 41 (69.5%) had indirect sacs and 8 (72.7%) had both sacs. Of the 100 patients operated by Lichtenstein repair: 79 (60.8%) had direct sacs, 18 (30.5%) had indirect sacs and 3 (27.3%) had both sacs. Chi square test was used to calculate ($p=0.000$).

Out of 100 patients who underwent TAPP, only 4 had complaints of pain and seroma collection, whereas, in the Lichtenstein repair 95 complained of pain ($p=0.000$). The median score of hospital stay in the TAPP group was 1 day compared to 4 days in the lichtenstein group ($p=0.000$).

The median number of days required to return to work was 3 days in the TAPP group compared to 15 days in the Lichtenstein group ($p=0.000$).

DISCUSSION

Ger reported the first laparoscopic hernia repair in 1982 by approximating the deep ring with stainless steel clips.¹⁵ The laparoscopic trans- abdominal preperitoneal (TAPP) repair is a concept introduced by Arregui¹⁶ and

Dion in the early 90's.¹⁷ The technique reproduces the concept of Stoppa by placing a large mesh in the pre-peritoneal space to cover half of the abdominal wall and all the weak areas (myopectineal orifice of Fruchaud) including deep ring, Hasselbach's triangle and the femoral ring. Both TAPP and TEP offer advantages of lesser pain, shorter hospital stay, early return to work, but, the possibility of a learning curve is present for both. The TEP repair takes a much longer learning curve.

In this prospective study, we compared lap TAPP repair versus conventional lichtenstein in regard to duration of stay in the hospital and postoperative complications.

Duration of stay in hospital

The stay in the TAPP group (average 1 day) was much shorter compared to the conventional Lichtenstein group (average 4 days).

Postoperative complications

Post-operative pain is another important outcome to consider when choosing between lap TAPP and conventional lichtenstein repair of inguinal hernias. Laparoscopy has been associated with lesser post-operative pain than conventional repair. A 2003 Cochrane Database Systematic Review demonstrated less persisting pain (overall 290/2101 vs. 459/2399, $p < 0.0001$), and less persisting numbness (overall 102/1419 vs. 217/1624, $p < 0.0001$) in the laparoscopic groups.¹⁸ Similarly, another meta-analysis study from the EU hernia trialists collaboration reported decreased post-operative pain with the employment of laparoscopic methods.¹⁹

Return to work

Numerous studies comparing laparoscopic and open hernia repairs use this as a variable to decide the primary outcome. A general consensus in literature is found, that, patients who undergo laparoscopic inguinal hernia repair return to work more quicker than those who undergo open repair.²⁰⁻²² A quick return to work is associated with an early discharge from the hospital and lesser post-operative complications, both of which are seen with laparoscopic hernia repair. Liem et al. reported that patients who underwent laparoscopic repair resumed normal daily activity 4 days earlier (6 days vs. 10 days; $p < 0.001$), returned to work 7 days earlier (14 days vs. 21 days; $p < 0.001$) and resumed athletic activities 12 days earlier (24 days vs. 36 days; $p < 0.001$) than those who had open repair.

CONCLUSION

Repair of inguinal hernias is one of the most frequently performed procedures in general surgery. Because of the significant socioeconomic impact of inguinal hernia repairs, it is imperative that the surgeons consider the most advantageous approach in each given situation.

Currently, both open (Lichtenstein) and laparoscopic (TAPP, TEP) repairs are employed in the repair of inguinal hernias and they confer various advantages and disadvantages.

Evidence in literature does not point to open or laparoscopic repairs as the clear superior procedure. Most of the randomised studies that compare laparoscopy to open repair have confirmed that the laparoscopic approach (TAPP or TEP) is associated with a longer time to operate with a steeper learning curve, more cost but, reduced post-operative pain and most importantly, an earlier return to work when compared with open repair. Since the evidence is somewhat equivocal, it is quite likely that the hernia repair will be on the surgeons' expertise and patients' acceptance.

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