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ORIGINAL ARTICLE

Surgical Outcome of Laparoscopic Transabdominal Preperitoneal Inguinal Hernioplasty in Zagazig University Hospitals

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ABSTRACT

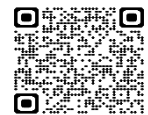
Background: Inguinal hernia is a common condition that can be managed only via surgery. The results support the view that laparoscopic transabdominal pre-peritoneal hernioplasty is a safe and satisfying technique. As the surgeons become more experienced in this procedure, The complication rate reduces in comparison with that of open hernioplasty. Laparoscopic transabdominal preperitoneal hernioplasty is safe with less post-operative complications and associated with faster recovery and satisfaction as documented by less post-operative pain, earlier ambulation and discharge from hospital, and also early return to work. **aim:** To treat inguinal hernia more effectively with a minimally invasive approach, improve the quality life of patients, and reduce complications and recurrence.

Methods: This study was conducted on 18 adult male patients presenting with inguinal hernias. These patients were admitted from those attending the surgical outpatient clinics of Zagazig university hospitals. Patients were subjected to inguinal hernioplasty using laparoscopic trans-abdominal preperitoneal approach.

Results: Out of 18 cases included; 7 cases had direct inguinal hernia while 11 cases were indirect. The operation time improved significantly with repeated training. There was early postoperative severe pain in one patient, 6 patients developed moderate pain, and 11 patients had mild pain on visual analogue score (VAS).

Conclusions: The present study supports the view that laparoscopic transabdominal pre-peritoneal hernioplasty of inguinal hernia is safe and efficient and has remarkable advantages over open hernioplasty and should be a viable option for all patients requiring elective hernia repair.

Keywords: laparoscopic transabdominal pre-peritoneal mesh repair, inguinal hernia repair, hernioplasty



INTRODUCTION

Hernia is defined as an abnormal protrusion of an organ or fatty tissue, such as the bowel, through the wall of the cavity in which it normally resides. Inguinal hernioplasty is a commonly done procedure worldwide. regardless of country, ethnicity or socioeconomic status, hernia constitutes a major health-care burden. The definitive management of all hernias, irrespective of their origin or type, is surgical repair with approximately 20 million repairs performed each year around the world [1].

The lack of unanimity in the literature regarding the optimum repair procedure or the best prosthetic

mesh for optimum a long-term durable result is also intriguing [2].

Hernias of the abdominal wall are common. They have a prevalence of 1.7% for all ages and 4% for those aged over 45 years. Inguinal hernias form about 75% of all hernias, with a lifetime risk of 27% in men and 3% in women [3].

Inguinal hernia is a commonly made diagnosis in the working population. The average male has a lifetime risk of 27%, which appears to drop after the age of 45 [4].

Men have a 7:1 risk over women to develop an inguinal hernia [5].

Inguinal hernioplasty is one of the most common surgical procedures conducted worldwide. Diagnosis of inguinal hernias is usually made using

good history taking and thorough physical examination and is typically indicated by a swelling in the groin. Treatment options for patients with inguinal hernias are variable including open primary repair, open tension-free hernioplasty, and laparoscopic repairs which are performed using a prosthetic mesh [6].

Inguinal hernia can be repaired using laparoscopic surgery. Different approaches can be performed such as laparoscopic transabdominal preperitoneal (TAPP) technique, laparoscopic totally extraperitoneal (TEP) technique and intra-peritoneal onlay mesh approach [7].

Laparoscopic inguinal hernioplasty started over twenty years ago. It has been growing as a modality of treatment for inguinal hernia [8].

As with other laparoscopic procedures, the avoidance of the musculofascial incision conveys specific benefits, including less pain and a prompt return to unrestricted activity [9].

The laparoscopic (TAPP) inguinal hernioplasty is a growing technique associated with the established advantages of a minimally invasive approach [10].

THE AIM OF WORK

The aim of the present study is to treat inguinal hernia more effectively with a minimally invasive approach and improve the quality life of patients in the form of early return to work and daily activities and reduce complications and recurrence by standardizing laparoscopic (TAPP) technique.

OBJECTIVES

To document cases of inguinal hernia undergoing laparoscopic (TAPP) hernioplasty, to determine the risk of complications and recurrence rate of laparoscopic (TAPP) hernioplasty and to document the length and events of the recovery period following (TAPP) hernioplasty.

METHODS

The Site of study:

These patients included in the study were admitted from those attending the surgical outpatient clinics of Zagazig university hospitals. Informed consent was obtained from all patients to participate in the present study.

Sample size:

The study was conducted on 18 adult male patients presenting with inguinal hernias.

Inclusion criteria

Male patients age between 17 to 70 years old, all cases of inguinal hernia undergoing laparoscopic (TAPP) hernioplasty and cases of Recurrent inguinal hernia.

Exclusion criteria

Patients with obstructed and strangulated hernia, patients with unclear operative data of the repair in their files, patients on anticoagulants or with

significant chest disease and those unfit for general anaesthesia (GA).

Ethical Considerations:

Written informed consent was obtained from all participants and the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The work has been carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

All patients were subjected to the following:

History taking:

Detailed history was obtained.

- Personal history: including name, age, occupation, residence and special habits of clinical importance particularly smoking.
- History of present illness: including analysis of the complaint; onset, course, aggravating and relieving factors, and a review of other body systems especially chest complains, bowel problems like constipation and urinary problem especially prostatism.
- Past history: of medical diseases, drug allergy, previous blood transfusion, and previous operations, with emphasis of previous complications of the hernia or previous attempts of treatment.
- Family history: of the presence of inguinal hernia and other diseases in the family.

Clinical Examination:

- General examination: including vital data, chest examination for signs of chronic obstructive pulmonary disease (COPD), abdominal examination for masses, and per rectal examination for prostatic enlargement.
- Local examination: of the inguinal region and scrotum to confirm the diagnosis of inguinal hernia and its type and for the presence of complications.
 1. Pre-interventional investigations include:
 - Complete blood picture, coagulation profile, liver and kidney function tests, and fasting blood glucose levels.
 - Special investigations: electrocardiogram (ECG) was requested for patients over 40 years of age.

Procedure:

Eighteen patients were subjected to inguinal hernioplasty using laparoscopic trans-abdominal preperitoneal repair. The patient is placed in a supine position on the operating table, urinary catheter is applied. The patient is draped with the entire abdomen, groin, penis and scrotum scrubbed. The surgeon stands on the contra-lateral side of the hernia being repaired with the assistant standing on the ipsilateral side of the hernia but joining the surgeon once the ports have been placed. The monitor is set at the foot of the hernia

side following these steps; Placement of trocars (one 10 mm trocar and 2x 5mm working trocars), Identification of anatomic landmarks (median and medial umbilical ligaments, ilio-pubic tract and the triangles of pain and doom), Dissection of the peritoneal flap, Dissection around the hernial sac, Fixation of 15x15 cm polypropylene mesh by using Tackers, Closure of the peritoneum and Removal of ports and closure of the skin **Figures (1,2,3).**

2. Post-Operative:

Antibiotics coverage by cefotaxime twice; one dose on induction of anaesthesia and another dose after 12 hours. All patients received a single dose of pethidine hydrochloride 50 mg intramuscular during early postoperative period. After that analgesia was maintained by nonsteroidal anti-inflammatory drugs (Diclofenac sodium 75mg) orally upon discharge. Postoperative pain using the visual analogue scale (VAS), Patients were asked to rate their pain this way at different intervals, early postoperative complications such as scrotal edema, hematoma, wound infection and urine retention, postoperative hospital stay (in hours), early ambulation and economic cost.

3. Follow up:

All patients were followed up at surgery outpatient clinic after one week then 1, 4 and 6 months later using a standardized telephone script. However, all patients were instructed to seek our advice whenever they notice something abnormal. During follow-up visits, the following is inquired: time at which the patient returned to work, late post-operative complications such as chronic pain (presence of inguinal or scrotal pain or pain in the mid-thigh area postoperatively and lasting for more than 3 months, detection of early recurrence.

STATISTICAL ANALYSIS

Data collected throughout history, basic clinical examination, laboratory investigations and outcome measures coded, entered and analyzed using Microsoft Excel software. We then imported the data into Statistical Package for the Social Sciences (SPSS version 20.0) (Statistical Package for the Social Sciences) software for analysis.

Table 1: co-morbidities among the studied group.

		N	%
Co-morbidity	-VE	12	66.7
	+VE	6	33.3
Hypertension	-VE	15	83.3
	+VE	3	16.7
Deep venous thrombosis	-VE	17	94.4
	+VE	1	5.6
Asthma	-VE	17	94.4
	+VE	1	5.6
Benign prostatic hyperplasia	-VE	17	94.4

According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD, the following tests were used to test differences for significance; difference and association of qualitative variable by Chi square test (X²). Differences between quantitative independent groups by t. P value was set at <0.05 for significant results & <0.001 for high significant result.

RESULTS

In this study, Age was distributed as **44.22±15.7** and majority were manual worker 50% followed by office clerk and student 16.7%, 44.4% were smoker, 16.7% were ex-smoker and no smoker were 38.9%.

Table (1) showing co-morbidities among the studied group. 33.3% of the patients had co-morbidity. 16.7% of them had HTN. DVT, asthma, BPH and Undescended testis were one case with 5.6%

Table (2) showing characters of the hernia among the studied group. Direct inguinal hernias were 38.9% of cases and indirect 61.1%. right sided hernias were 44.4% while left sided ones were 33.3% and bilateral 22.2%. recurrent hernia were 27.8% of cases, and complicated was a single case with 5.6%.

In the present study, operation time was distributed as **1.36±0.62 hours**. The operation time improved significantly with repeated training (reduced from 2.5 hours to only 45 minutes). Hospital stay averaged around **7.77±2.21 hours** and Return to work **4.55±1.51 days** as shown in **Table (3).**

Table (4) showing Assessment of intensity of postoperative pain was evaluated according to the VAS distribution. There was early postoperative severe pain in one patient (5.6%), 6 patients (33.3%) developed moderate pain, and 11 patients (61.1%) had mild pain. During 1-month follow-up period, there was moderate pain in two patients (11%) and mild pain in 15 patients (83.3%); by the end of the fourth month, there were only seven patients with mild pain. Follow-up was performed at 7 days and at 1, 4, 6 months

		N	%
Undescended testis	+VE	1	5.6
	-VE	17	94.4
	+VE	1	5.6
	Total	18	100.0

Table 2: characters of the hernia among the studied group.

		N	%
Type	Direct	7	38.9
	Indirect	11	61.1
Side	Right	8	44.4
	Left	6	33.3
	Bilateral	4	22.2
Recurrent hernia	Not	13	72.2
	Recurrent	5	27.8
Complicate	Not	17	94.4
	Complicated	1	5.6
	Total	18	100.0

Table 3: Showing the operation time, hospital stay and return to work.

	Operative time	Hospital stay	Return to work
Mean± SD	1.36±0.62	7.77±2.21	4.55±1.51
Median (Range)	1.0 (0.75-2.5)	7.0 (5-12)	4.0 (2-7)

Table 4: showing VAS distribution among studied groups

	VAS 1w	VAS 1m	VAS 4m	VAS 6m	P
Mean± SD	4.16±1.5	2.05±0.74	0.92±0.84	0.32±0.31	0.00**
Median (Range)	4.0 (2.0-7.0)	2.0 (0.0-4.0)	0.0 (0.0-3.0)	0.0 (0.0-1.0)	

Figure (1): laparoscopic view of the bilateral inguinal region

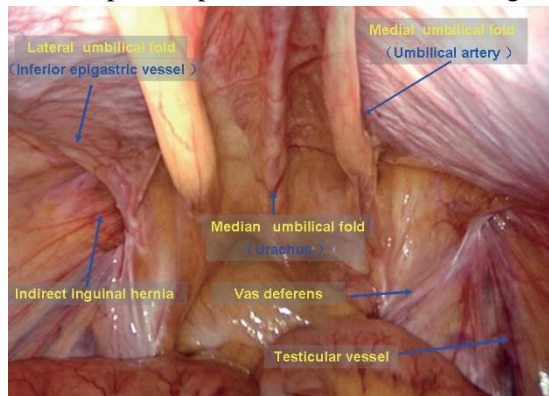


Figure (2): Opening and dissection of the peritoneal flap, dissection of the peritoneal flap medially to expose the symphysis pubis and laterally towards the ASIS.

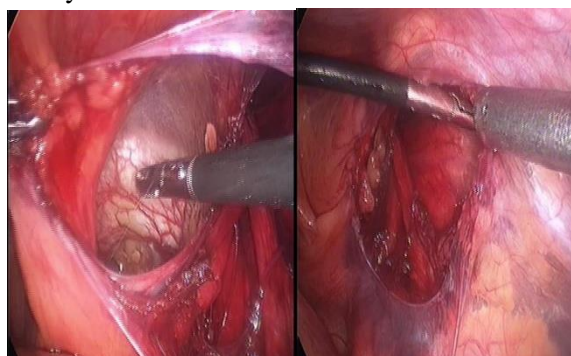
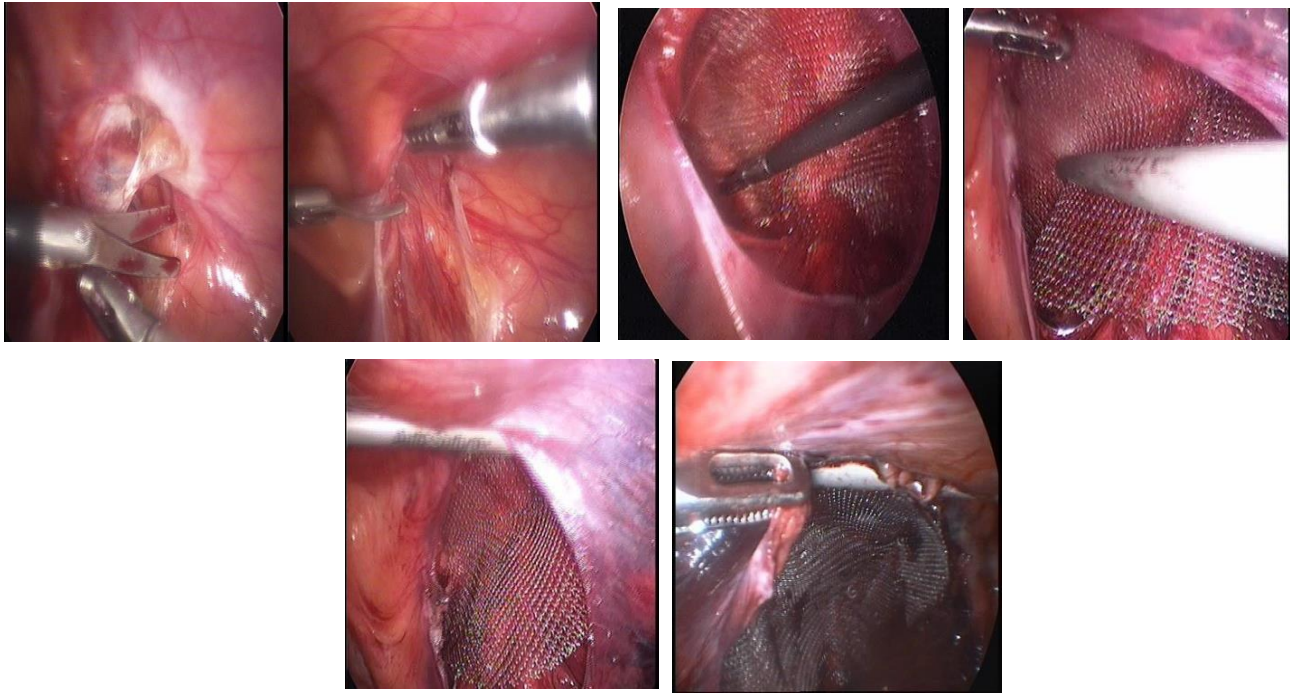


Figure (3): Fixation of the mesh



DISCUSSION

Currently, there are two types of laparoscopic hernia repair: the TAPP repair and the totally extraperitoneal repair. TAPP repairs are preferred as they are easier from the technical point of view, provide a better anatomical view, and do not require further equipment beyond the normally laparoscopic equipment available in most departments performing laparoscopic procedures. Many studies have shown a clear advantage of laparoscopic hernioplasty over open repair in terms of postoperative pain reduction and rapid return to work and normal activities [10].

In this study, all patients were male, ages varying between 18-70 with median of 42 years old. Age is an important factor in the prognosis of inguinal hernia. It has an effect on the risk of complication. Majority were manual worker 50% followed by office clerk and student 16.7%. This is an indicator that manual work and heavy lifting is indeed a factor that increases the risk of developing inguinal hernia. These percentages were comparable to those of the study published by Eisa et al.

44.4% were smoker, 16.7% were ex-smoker and no smoker were 38.9%. Smoking can lead to chest complications such as COPD and chronic cough with increase the risk of developing inguinal hernia especially in patients with weak abdominal muscles.

Direct inguinal hernias were 38.9% of cases and indirect 61.1%. Right sided hernias were 44.4% while left sided ones were 33.3% and bilateral 22.2%. Recurrent hernia were 27.8% of cases, and complicated was a single case with 5.6%. Similar

Percentages of patients were taken by Nawar et al. in their study [11].

As regard operative time was distributed as 1.36 ± 0.62 hours. The operation time improved significantly with repeated training (reduced from 2.5 hours to only 45 minutes). The average operative time in unilateral inguinal hernia is 58 minutes and 72 minutes for bilateral cases as stated by Altintoprak et al. [12].

Duration of procedure varies between surgeons and also vary markedly between centers. It is reduced with experience. Although it is not as important to the patient as success of the surgery, the time taken to perform the surgery can have marked effect on the cost of the operation [13, 14]. Pain is the most common complaint after hernia surgery. In agreement with the study published by Salma et al. TAPP reduced the incidence of severe postoperative pain (5.6%) in comparison with the Lichtenstein repair (around 50% of cases) [15]. Studies have reported an intraoperative bowel injury rate of 0–0.06% in laparoscopic hernia repair. In This study, there were no bowel, major vascular, or bladder injuries. No cases of vas deferens injury were reported in this study which is considered an improvement over open inguinal hernia repair which has a 0.1–0.53% risk of vas injury [16].

Scrotal edema is a common complication post hernioplasty and can mimic recurrence of inguinal hernia. In this study only two cases of postoperative scrotal edema were reported (11.1% of cases) which is considered an improvement over the results of the study published by Eisa et al. in

which 17.7 % of cases presented with scrotal edema. Scrotal edema after TAPP can be prevented by careful dissection and avoidance of aggressive manipulation of the tissues during dissection [8]. Recurrence is one of the most feared complications of inguinal hernia as it usually associated with complication such as incarceration, obstruction or strangulation. Many factors are implicated in recurrence such as technical issues, poor patient compliance or factors that increase intra-abdominal pressure such as chronic cough, benign prostatic hyperplasia or chronic constipation.

In this study, we discuss early recurrence within six months. Only one case reported recurrence of inguinal hernia (5.6%) which is comparable to the recurrence rate in the study published by Fitzgibbons and Puri. They concluded that the factors leading to recurrence include surgeon inexperience, inadequate dissection, insufficient prosthesis size, insufficient prosthesis overlap of hernia defects, improper fixation, prosthesis folding or twisting, missed hernias, or mesh lifting secondary to hematoma formation. The reported incidence of recurrence after TAPP was around 0–3% [16].

An important factor in determination of the effect of a hernia repair technique, or any operation, is the period of hospital stay and the time needed to return to work. It is an indicator of patient recovery. Early recovery means less complications, patient satisfaction and subsequently better quality of life. TAPP hernioplasty significantly decreased the period of hospital stay and the time the patients needed to return to work.

In this study, Patients after TAPP had and average hospital stay of 7.77 ± 2.21 hours. And returned to work within 4.55 ± 1.51 days. The duration of hospital stay in patients of our study is significantly lower than that of the study published by Nawar et al in 2016 which stated that the average of hospital stay is 24.53 ± 4.64 hours.

CONCLUSION

The present study supports the view that laparoscopic transabdominal pre-peritoneal inguinal hernioplasty is a safe and efficient technique that offers considerable advantages and should be a viable option for all patients requiring elective hernioplasty

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