



Outcome and Predictors of complications of laparoscopic inguinal hernia

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Article History: Received: 20.06.2022

Revised:09.07.2022

Accepted: 28.11.2022

Abstract:

Background: The most prevalent type of hernia is the inguinal hernia. Transabdominal preperitoneal (TAPP) repair can be used for laparoscopic inguinal hernia repair. There are no data on the short-term results of laparoscopic inguinal hernia repair. So we aimed to evaluate outcome and predictors of complications of laparoscopic inguinal hernia.

Methods: This study was carried out in Department of General Surgery, Tobruk Medical Center, Libya on patients diagnosed as having inguinal hernia and underwent TAPP repair. All patients were followed up for complications and recurrence.

Results: Only 20% of patients had foreign body sensation and seroma. 15% of patients had seroma at 7th day and 5% had seroma at 1st month.

Conclusion: Concurrent laparoscopic inguinal hernia repair is safe and feasible and does not expose the patient to more risk. Chronic cough, constipation, lifting heavy objects, DM and smoking were independent predictors of overall complications.

Keywords: TAPP, recurrence, infection, seroma.

DOI: 10.53555/ecb/2022.11.12.274

Introduction:

Ninety percent of all spontaneous hernias are inguinal hernias, making them the most common type of hernia. In general surgery, inguinal hernia repairs are the most common procedures done (1).

An inguinal hernia has a cumulative incidence of 27% in men and 3% in women, and the risk rises with age. Worldwide, more than 20 million inguinal hernia repairs are made each year. (2).

Thus, to comprehend the nature of the hernia, one must recognize the anatomy of the inguinal region, and all hernias require surgical repair. A variety of surgical techniques are available to treat inguinal hernias. In the past, more conventional techniques based on primary repair were appropriately applied. Today, though, the gold standard for inguinal hernia surgery is mesh repair without hernial stretching thanks to the development and availability of artificial meshes. (3).

Transabdominal preperitoneal (TAPP) hernial repair is a viable option for laparoscopic inguinal hernia repair. The inguinal anatomy can be seen more clearly and the back of the wall can be seen in TAPP. A mesh is inserted into the peritoneal area to do this. The dissection reaches the peritoneal space through the abdominal cavity, where it is repaired by inserting the mesh after the sac has been removed from the herniated area (4).

TAPP is notably advised for problematic hernias (slide or incarcerated hernias) and recurring hernias (after preperitoneal patch plastic). The TAPP offers the advantages of being simpler to use, having a higher chance of standardization, and having the potential to be used for diagnostic laparoscopy. The learning curve for TAPP appears to be lower in general, and since the type of hernia and the condition on the other side can be evaluated right away, both sides can be sufficiently repaired without the need for additional incisions. (5, 6).

Identifying mild or severe consequences is frequently ambiguous. For example, seromas are typically thought of as low-grade, common problems, yet anticoagulated patients may experience serious complications, including mortality, from intraoperative or postoperative hemorrhage. (7).

So, we aimed to evaluate outcome and predictors of complications of laparoscopic inguinal hernia.

Patients and Methods:

This study was carried out in Department of General Surgery, Tobruk Medical Center, Libya. An informed written consent was obtained from all patients. The study was conducted according to Helsinki Declaration. The study included individuals with inguinal hernias who were medically fit to have the surgery and older than 18 years.

Patients with irreducible and obstructed hernia, previous lower abdominal surgery and radiotherapy, unfit to do the procedures; cardiac diseases, coagulopathies, obstructive airway disease and patients with recurrent inguinal hernia and patients lost during follow up were excluded from the study.

Every patient was admitted via the outpatient clinic and was exposed to complete history taking with stress on the predisposing factors for the occurrence of hernia (such as smoking, chronic cough, chronic constipation, difficult micturition, nature of jobs requiring lifting heavy objects, previous lower abdominal surgery...), general and local examination of the inguino-scrotal region to detect the type of hernia, its size and to exclude complicated hernia, routine preoperative laboratory investigations, specific investigations for evaluation of cardiopulmonary fitness of the patients for laparoscopic surgery: ECG and chest x-ray, U/S abdomen and pelvis. Scrotal U/S was done for cases associated with varicocele or hydrocele. The patients had mesh fixation performed during laparoscopic TAPP surgery for inguinal hernias.

Preoperative preparation:

Consent was obtained, permitting conversion to open repair if necessary. The hernia's side was identified. NPO for a minimum of six hours. Shaving mid-thigh, groin, and xiphoid. A Foley's catheter was inserted prior to surgery and removed once the patient becomes ambulatory.

Operative technique:**Trans-Abdominal PrePeritoneal (TAPP) repair**

All patients were subjected to general anesthesia with endotracheal intubation in all cases. The patient's arms were tucked to the side as they were positioned supine in the Trendelenburg position. While the assistant, a camera operator, is positioned next to the surgeon at the patient's shoulder, the surgeon stands on the other side of the hernia, facing the pelvic. At the foot of the table, on the side where the hernia lies, is where the video monitor is situated. Prophylactic antibiotic (Cefotaxime sodium 1gm) was given with the induction of anaesthesia. A routine sterile skin preparation was performed to include the entire abdominal wall, the upper thigh, penis and scrotum to facilitate external abdominal counter pressure during the procedure. Insertion of ports and pneumoperitoneum creation, peritoneal dissection, lifting the peritoneal flap, dissection of the hernial sac, fashioning and placement of the mesh and closing the peritoneum were performed.

Post operative course

Before being sent to the ward for additional observation for six to twelve hours before being released to their home, the patient was watched in the recovery room for about an hour. Four hours later, oral fluids were permitted. After the patient was able to walk, Foley's catheter was taken out. Analgesics (NSAIDs, I.M.) were used as needed before switching to twice-daily oral tablets of diclofenac potassium (50 mg). Patients are urged to begin walking and engaging in everyday activities as soon as feasible. Patients were monitored and information was recorded regarding any problems, including seroma, hematoma, or neuralgia, as well as the degree of postoperative pain. Complaints such as subcutaneous emphysema, shoulder pain, scrotal edema, or testicular pain were also noted.

Most patients were released the following day or within 48 hours. When they were discharged, they were instructed to return for the first follow-up in 7-8 days, the second follow-up in 1 week, and the third follow-up in 1 month following surgery. Later, following surgery for three months (fourth follow-up), and six months (fifth follow-up) and once after one year. Patients follow up was done clinically (history and examination) and by ultrasonography one and six months post-operatively to detect complications. (recurrence, hematoma).

Results

Table (1): Baseline data of the studied group

Variables	Laparoscopic inguinal hernia repair (N=60)
Age	44.9 ± 12.5 25-83
BMI	24.8 ± 1.36 22.9-28.5
DM	15 (25%)
ESRD	5 (8.3%)
Liver disease	7 (11.7%)
HTN	12 (20%)
Smoking	30 (50%)
Chronic cough	30 (50%)
Constipation	15 (25%)
Lifting heavy objects	18 (30%)
Side of hernia	
Unilateral	48 (80%)
Bilateral	12 (20%)
Hernia diameter (cm)	2.9 ± 0.6

	1.7 - 4.3
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The mean age was 44.9 ± 12.5 and ranged from 25 to 83 years, the mean BMI was 24.8 ± 1.36 , the most common comorbidities were smoking (50%) followed by DM (25%) then HTN (20%). Regarding risk factors, half of patients had chronic cough, 30% had lifting heavy objects and 25% had constipation. The majority of patients (80%) had hernia in unilateral side and the mean diameter of hernia was 2.9 ± 0.6 cm (Table 1).

Table (2): Operative time of studied group.

Variables	Laparoscopic inguinal hernia repair (N=60)
Operative time (min)	73.2 ± 8.3 62 - 90

The mean operative time was 73.2 ± 8.3 and ranged from 62 to 90 minutes (Table 2).

Table (3): Postoperative bed activity time, length of hospital stays and return to work in the studied group.

Variables	Laparoscopic inguinal hernia repair (N=60)
Postoperative bed activity time (h)	25.2 ± 4.1 15-35
Length of in-hospital stay	31.5 ± 5.1 25-39
Return to work, day	7.5 ± 1.9 5 -10

The mean postoperative bed activity time was 25.2 ± 4.1 , the mean length of in hospital stay was 31.5 ± 5.1 and the mean return to work was 7.5 ± 1.9 days (Table 3).

Table (4): Postoperative Numeric Rating Scale at different time intervals of studied group.

Variables	Laparoscopic inguinal hernia repair (N=60)
Postoperative Numeric Rating Scale At the 1st day	4.9 ±0.95 2-6
Postoperative Numeric Rating Scale Prior to discharge	3.87 ± 0.79 3-5
Postoperative Numeric Rating Scale at 1st week	2.7 ± 0.9 1-4

The mean postoperative Numeric Rating Scale At the 1st day, Prior to discharge and at 1st week was 4.9 ±0.95, 3.87 ± 0.79 and 2.7 ± 0.9 respectively (Table 4).

Table (5): Number of cases of analgesic use in post-operative patients

Variables	Laparoscopic inguinal hernia repair (N=60)
Number of cases of analgesic use in post-operative patients	12 (20%)

20% of cases had analgesic use post-operatively (Table 5).

Table (6): Complications among studied group.

Variables	Laparoscopic inguinal hernia repair (N=60)
Complications	
No	48 (80%)
Seroma 7 days	9 (15%)
Seroma 1 month	3 (5%)
Recurrence	0 (0%)
Foreign body sensation	12 (20%)

Only 20% of patients had foreign body sensation and seroma. 15% of patients had seroma at 7th day and 5% had seroma at 1st month (Table 6).

Table (7): Multivariate analysis (MVA) with overall complications as the dependent variable.

Overall complications MVA	OR (95% CI)	P value
Chronic cough	2.66 (1.12-6.37)	0.001
Constipation	1.50 (1.12-2.02)	0.01
Lifting heavy objects	2.17 (1.31-3.59)	0.001
DM	1.02 (1.02-1.01)	0.02
Smoking	1.92 (3.31-1.12)	0.001

We set overall complication rate as the dependent variable. Chronic cough, constipation, lifting heavy objects, DM and smoking were not connected to the overall number of problems. Additionally, LHR independently predicted total problems in this analysis (Table 3)

Discussion:

Hernia is a common problem of the modern world which have different types (8). An alternative to open mesh treatment for inguinal hernia repairs is the transabdominal preperitoneal (TAPP) procedure. Compared to an open operation, it has a number of benefits, such as less trauma, fewer early complications, a quicker recovery after surgery, and so on. The following are standard TAPP protocols. First, the abdominal cavity is entered. (9).

We demonstrated that the mean age was 44.9 ± 12.5 and ranged from 25 to 83 years, the mean BMI was 24.8 ± 1.36 , the most common comorbidities were smoking (50%) followed by DM (25%) then HTN (20%). Regarding risk factors, half of patients had chronic cough, 30% had lifting heavy objects and 25% had constipation. The majority of patients (80%) had hernia in unilateral side and the mean diameter of hernia was 2.9 ± 0.6 cm.

In agreement with our study, **Wauschkuhn et al. (5)** demonstrated that bilateral hernia was more common (71.5%). **Li et al. (10)** showed that all patients were males. In addition, **Wang et al. (11)** showed that all patients had similar demographic features and indications for surgery.

Also, **Mohammad et al. (12)** showed that the patients were in middle age with the mean age was 43.8 ± 16.5 years. **Kalidarei et al. (4)** showed that the mean age was 50.51 ± 10.23 years.

Darwish et al. (13) showed that all the patients were males, with a mean age of 37.133 ± 9.558 years (range: 22–55 years).

We showed that the mean operative time was 73.2 ± 8.3 and ranged from 62 to 90 minutes. We revealed that the mean postoperative bed activity time was 25.2 ± 4.1 , the mean length of in hospital stay was 31.5 ± 5.1 and the mean return to work was 7.5 ± 1.9 days.

In agreement with our study, **Wauschkuhn et al. (5)** demonstrated that took into account the total number of patients operated on, the average surgery time was 70 minutes.

In agreement with our study, **Li et al. (10)** showed that the mean operative duration was 60.5 ± 12.2 min and time to ambulation was 28.3 ± 6.0 . **Wang et al. (11)** showed that operation time was 78.9 ± 8.8 min. Also, **Kalidarei et al. (4)** showed that the duration of surgery was 73.8 ± 0.54 min. The average time spent in the hospital before going back to work was 1.18 ± 0.48 and 6.90 ± 1.92 days.

Darwish et al. (13) showed that mean operative time was 74.633 ± 10.434 min (range: 55–92 min). A mean of 1.9 ± 1.689 days was spent in the hospital. After 7.867 ± 2.662 days, the patients went back to work..

We showed that the mean postoperative Numeric Rating Scale at the 1st day, Prior to discharge and at 1st week was 4.9 ± 0.95 , 3.87 ± 0.79 and 2.7 ± 0.9 respectively.

In addition, **Kalidarei et al. (4)** showed that at the moment of release, the pain score was 3.34 ± 2.26 . Furthermore, at one and two weeks following the procedure, the mean pain score was 2.76 ± 1.62 and 2.34 ± 1.37 , respectively.

Furthermore, **Darwish et al. (13)** showed that a numerical rating scale, with 0 denoting no pain and 10 denoting severe pain, was used to assess the patients' pain. The ranges were then separated into three categories: moderate pain (4-6), severe pain (7–10), and mild pain (1-3). The mean of the first 24-hour postoperative pain was 4.067 ± 1.112 . Regarding the follow-up, the pain was 3.567 ± 1.331 at one week, 2.633 ± 1.520 at one month, 1.867 ± 1.613 at six months, and 1.233 ± 1.501 at twelve months.

We demonstrated that 20% of cases had analgesic use post-operatively. This came in agreement with **Wang et al. (11)** who showed that the percentage of patients prescribed analgesics was 26.3%.

We showed that only 20% of patients had foreign body sensation and seroma. 15% of patients had seroma at 7th day and 5% had seroma at 1st month. No recurrence was observed.

This came in agreement with **Ersoz et al. (14)** who found that the assessment of inguinal hernia repairs is based on the rates of recurrence. There were no hernia recurrences over the follow-up period, which ranged from 6 to 24 months on average. This suggests that the treatment was safe.

In addition, **Sajid et al. (15)** they out a meta-analysis on laparoscopic hernioplasty using mesh fixation and suggested that the likelihood of a hernia recurrence was not increased by hernioplasty. Currently, research on hernia surgery is concentrated on finding ways to lower postoperative problems and enhance the quality of life for patients. Hernioplasty may lower the incidence of chronic pain and enhance quality of life without raising the risk of hernia recurrence. Also, **Mohammad et al. (12)** showed that only six occurrences of chronic pain described as a foreign body sensation or discomfort were documented.

Furthermore, **Li et al. (10)** showed revealed five patients (10%) experienced scrotal hematomas seven days following surgery; in four of them, the hematomas cleared up on their own after a month. The last patient needed the fluid to be aspirated with a fine needle and recovered completely three months later. Seven patients (14%), reported feeling as though something was strange in the inguinal area. Moreover, throughout the follow-up period, none of them reported a recurrence or wound infection.

Wang et al. (11) showed that total postoperative complication rate was 28.9% (11 of 38 patients) and there was no recurrence.

Huerta et al. (16) showed that Urinary retention, severe complications, and postoperative inguinal discomfort were all more common with the laparoscopic technique (7.0%, 5.5%, and 2.3%, respectively).

Wauschkuhn et al. (5) demonstrated that morbidity was 1.9%, recurrence rate was 0.63%, reoperation rate was 0.5%, and the number of repaired hernias was 1.9%. Also, **Mohammad et al. (12)** showed that recurrence was not recorded at the time of examination. During the follow-up period, there were no occurrences of port site hernia reported.

Kalidarei et al. (4) showed that Urinary retention (34.1%), seroma (7.3%), and neuralgia (26.7%) were the early (1 week after the surgery) and late (2 weeks, 1 month, or 6 months after the surgery) problems.

Darwish et al. (13) showed that two (6.7%) patients developed seroma, which was managed conservatively, whereas none of the patients developed infection, adhesion, or obstruction.

We set overall complication rate as the dependent variable. Chronic cough, constipation, lifting heavy objects, DM and smoking were not connected to the overall number of problems. LHR also independently predicted total problems in this investigation.

Conclusion:

Simultaneous laparoscopic repair of inguinal hernias is safe and feasible, poses no additional risk to the patient, and results in a speedier recovery with no recurrence rates. The gold standard for hernia repair should be laparoscopic inguinal hernia repair.

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