

Evaluation of Outcome to Open Repair and Laparoscopy Techniques in Ventral and Incisional Hernias

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ABSTRACT

Hernias can be defined as protruding or bulging tissues through an opening of weakness within abdominal wall muscles. In contrast, an Incisional hernia is defined as an abdominal wall defect. These are the most routinely practiced surgeries performed by general surgeons. Risk aspects that raise the chances of these hernias are abdominal distension, obesity, wound infection, male sex, other associated disease process and occasionally poor surgical closure. The study aims to compare the open surgery with laparoscopic ventral hernia repairs. The data of 100 patients who were operated for anterior abdominal wall hernia in the hospital between January 2020 and January 2021, were recorded and analyzed. All patients were informed about the laparoscopy and open surgery techniques for the removal of hernia but the final decision was made on the mutual consent of the surgeon and the patient, depending on the patient's preference. The study included one hundred patients operated on due to anterior abdominal wall hernia between January 2020 and January 2021. The demographic data of the patients was demonstrated and included. Of the 100 patients, 57 patients were operated laparoscopically, and 43 patients underwent the open surgery group. No drain was placed in any patient in the laparoscopic group, while open surgery group, the mean drain stay was 4.2 (2-14) days. The laparoscopy was found to be showing less complications with the requirement of shorter hospital stay time over the open surgery method.



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1. INTRODUCTION

Ventral hernias can be defined as protruding or bulging tissues through an opening of weakness within abdominal wall muscles.^{1, 2} In contrast, an Incisional hernia is defined as an abdominal wall defect.^{3, 4} The hernia surgeries are one of the most common surgeries. ^{5, 6} abdominal distension, obesity, wound infection, male sex, other associated disease process and occasionally poor surgical closure are some of the major risk aspects that raise the chances of these hernias.^{1, 7} Recurrence rates in the management of

incisional hernia remain unacceptably high and reported as high as 33% after the first repair and 44% after the second repair. Recently, laparoscopic repair of ventral hernias has infused the field with new interest and enthusiasm [1], [2]. It has been reported that the laparoscopic ventral hernia repair require a short hospital stay (1.8 days) with acceptable complication (20%) and recurrence (4.7%) rates. The present study aims to compare open surgery with laparoscopic ventral hernia repairs [3].

2. METHODS

The data of 100 patients who were submitted to be operated for anterior abdominal wall hernia in, Al Jumahory Teaching Hospital, Mosul, between January 2020 and January 2021 and whose data were recorded, were included in the study for analysis and comparison. All patients were informed about the detailed methods and risk factors of laparoscopic and open surgery. The operation method was chosen together by the surgeon and the patient, depending on the patient's preference. Except for anterior abdominal wall hernias (incision site and ventral hernias), patients who were operated for other abdominal wall hernias such as inguinal, femoral or spiegel hernias were not included in this study. All abdominal wall hernias operated on by primary repair without a mesh, were also excluded from the study. Of the 100 patients included in the study, 57 patients whose surgery was completed laparoscopically were defined as (group 1), and patients in whom mesh were placed with the onlay mesh placement (open surgery) were defined as (group 2) (n:43, 43%). The cases were evaluated in terms of demographic data, body mass index (BMI), repair methods, duration of surgery, length of hospital stay, and postoperative complications. All patients received thromboembolism and antibiotic prophylaxis before surgery. Only mesh placement was applied to all patients who were submitted to open surgery. In this technique, after the rectus sheath was dissected from the subcutaneous fatty tissue, the intact tissue borders around the hernia neck were closed by suturing with Polydioxanone (PDS II) (a synthetic, absorbable, monofilament suture). In the cases where they were facing each other without tension, a polypropylene suture was placed around the rectus sheath, covering at least 3 cm of intact tissue, and fixed on the rectus sheath with prolene 2/0 or 3/0. If the intact tissues around the hernia neck were mutually tense, the defect was repaired using a Dual-mesh patch. Patients who underwent layer separation (component separation) were excluded from the study. Depending on the size of the defect, at least one aspiration drain was placed before the subcutaneous tissue was closed. The skin was closed with 3/0 prolene. Laparoscopic repairs were performed with lateral and inferior trocar placement, if possible, depending on the defect allowing port access. After the first port was entered, preferably with the open method or with the help of the optical sight port, the other ports were entered under direct vision. Intra-abdominal adhesions were separated by blunt and sharp dissection. The patch (dual-mesh) defect was fixed to the anterior abdominal wall with the help of a laparoscopic tucker, at least half the diameter of the hernia.

In patients who were submitted to laparoscopic surgery, no drain was placed at the end of the operation. The drain was removed after the contents became completely serious and the flow rate fell below 40 ccs. For pain relief, 4x500 mg IV paracetamol and narcotic analgesics (pethidine hydrochloride 4x0.5 mg/kg) were administered 24 hours after the surgery. Oral 4x500 mg paracetamol was given for at least one week postoperation. Oral whole food was started in all patients with oral fluid intake and tolerance at the 6th hour postoperation. All cases were called for outpatient followup controls on the 10th day after discharge. In patients without complaints, follow-up controls were performed at 1, 3 and 12 months after surgery. The patients who did not come were called by phone. Swelling at the operation site and detecting a facial defect on ultrasonography (USG) were considered recurrences. If wound infection was developed and recurrence was detected during the follow-up, the follow-up was terminated. In addition to routine physical examination, superficial abdominal ultrasonography was performed in case of clinical necessity. The statistical evaluation used independent samples t-test, Chi-square test (Fisher's exact test), and Mann-

Whitney U test. All parameters were given as mean (\pm standard deviation). All the analysis were performed with the SPSS program. $P < 0.05$ was considered significant, and values above it were considered insignificant (NS).

All procedures performed in the study involving human participants followed the ethical standards of the Institutional and National Research Committee and the 1964 Helsinki declaration and its later amendments, including informed consent and confidentiality of all personal information. The study protocols were approved by the Ethics Committee of Mosul University (Ethical Approval Number IR. sums. Rec2742).

3. RESULTS

The study included one hundred patients operated on due to anterior abdominal wall hernia between January 2020 and January 2021. The demographic data of the patients was demonstrated in Table 1. Of the 100 patients, 57 patients were operated laparoscopically, 43 patients were operated with open surgery. In the group 1, in which the patients underwent with laparoscopic surgery the type of incision made is shown in Table 2.

In the open surgery group 43 patients, 18 (18%) were midline, 11 (11%) A Pfannenstiel incision, 6 (6%) epigastric, 5(5%), and three (3%) umbilical port site, (Table 2). No drain was placed in any patient in the laparoscopic group, while in the open surgery group, the mean drain stay was 4.2 (2-14) days. The operation time was significantly higher in the laparoscopic group than in the open surgery group (Table 3). On the other hand, the length of hospital stay was found to be significantly lower in group 1. Mean follow-up time was similar in both groups (Table 4). When the general complication rates during and after the operation were compared, it was found that there were significantly more complications in Group 2 of open surgery (Table 5). Seoma (10 %) was the major complication with the open surgery. The Past hernia surgery (8 %) was found to be the major factor in relapse cases (P value: 0.001). The open surgery showed the least relapse cases (1 %) followed by that of laparoscopic technique (3%) (Table 6).

Table 1. Demographic data of the patients

Variables	Mean/ percentage
Age (years)	(51 \pm 11) Y
Gender (male/female)	44%/56%
Body mass index (kg/m ²)	(30 \pm 7) (kg/m ²)
Active smoker	20%
A.S.A. † score	(2.2 \pm 0.4)
Hypertension	41%
Diabetes mellitus	11%
Hyperlipidemia	8%
Coronary artery disease	2%
COPD	1%
History of stroke/CVA	1%
History of myocardial infarction	1%
Congestive heart failure	1%

†ASA American Society for Anesthesiologists

Table 2. Comparison between the type of surgery and type of surgical incision

Laparoscopic surgery	No.	Fraction
• Pfannenstiel incision	20	20%

• umbilical port site	14	14%
• umbilical port site	10	10%
• stoma site	10	10%
• periumbilical hernia	3	3%
Total	57	57%
Open surgery	No.	Fraction
• midline	18	18%
• Pfannenstiel incision	11	11%
• epigastric	6	6%
• umbilical port site.	3	3%
• Total	43	43%

Table 3. Perioperative data of the patients

Variable	Laparoscopic surgery	Open surgery
surgical time (mins)	24 ± 15 mins	31±11
estimated blood loss (mL)	40 ± 30 ml	50±32 ml
defect area (cm ²)	12.1 ± 11	11±9
mesh area (cm ²)	45± 10	40±6
LOS [†] (days)	1.5 ± 1.3	2±1.5
Mesh fixation		
None	4%	10%
Fibrin glue alone	71%	70%
Tacks	7%	6%
Suture	6%	5%
Fibrin glue and suture	5%	4%
Fibrin glue and tacks	4%	3%
Suture and tacks	3%	2%
Total	100%	100%

†LOS: Length of Stay

Table 4. Comparison of operative time, hospital stay and mean follow-up times

Time	Laparoscopic surgery	Open surgery	p-value
Duration of Operation (min)	24±15 mins	31±11	0.001
Duration of Hospitalization(Days)	1.5±1.3	2±1.5	0.01
Average follow-up period (Days)	7±3	7±3	0.99

Table 5. Comparison of the complications during and after surgery between two surgical types

Complication	Laparoscopic surgery	Open surgery
Complication related to Wound Infected		
• Seroma	3%	10%
• Wound dehiscence	1%	6%
• Surgical site infection	1%	5%
• Hematoma	0%	0%
• Deep abscess	0%	0%
• Graft infection	0%	0%
• Skin Necrosis	0%	1%
Non-wound-related		

• Ileus	0%	3%
• Prolonged Pain	0%	2%
• Bowel Injury	0%	0%
• Bowel Fistula	0%	0%
• Relapse	1%	3%
• Stroke	0%	0%
• Pneumonia	0%	0%
• Myocardial infarction	0%	0%
• CHF	0%	0%
• UTI	0%	0%
Intraoperative complications		
• 30-day readmissions	0%	2%
• Hernia recurrence n	1%	3%

Table 6: Factors affecting relapse

Factors	Relapse		P-value
	Yes	No	
Laparoscopy	3%	97%	0.01
Open surgery	1%	99%	
Past hernia surgery	8%	92%	
VKI	6%	94%	

4. DISCUSSION

A hernia is a common problem, and herniotomy is its standard treatment against which all alternative treatment modalities are evaluated. It is credited with being easy to perform, having a high success rate and a low rate of complications. Anterior wall hernias consist of a wide range of hernias, including incision site, umbilical, epigastric and suprapubic hernias [4]. Morbid obesity, concomitant diseases, immunosuppression, and prostate diseases accompanied by voiding disorders are known essential factors in the formation of incisional hernias. Although the first five years after surgery is the most critical time for redeveloping hernias, they can also develop in the future [5]. However, in tune with the explosion of slightly invasive surgery in all general surgery fields, Laparoscopy is also achieving popularity in hernia surgery. It is becoming the procedure of choice due to its less invasive nature, short post-operative hospital stays, low wound infection rates and low recurrence rates. All these factors have led to the growing adoption of this technique for herniotomy [6- 8]. In laparoscopic operation, besides the advantages such as minimal tissue trauma, laying the graft by sewing the graft and surrounding healthy tissue in detail, a more comfortable view is provided by the magnification effect of the telescope. Still, besides these advantages, experience is required for successful results. In addition, the transition from laparoscopy to open surgery should not be considered a failure or a complication. In this series, we started laparoscopic surgery in 58(58%) patients and switched to open surgery in 1 patient (1%). The patient who converted to open surgery was a patient who had been operated on twice for recurrence and had multiple defects. In this patient, open surgery was performed because of advanced adhesions of the small intestine and omentum in the hernia sac. Similar to the literature, the operative time was found to be significantly longer in the laparoscopic group compared to the open surgery group, and the hospital stay was found to be significantly short [9], [10].

We evaluated the long duration of the operation in the laparoscopic group as the duration of the operations performed while the surgical team was completing the learning curve and the time elapsed during patch fixation. In terms of the complication rates, it was found that there were significantly more complications in the open surgery group. In a meta-analysis by it was found that Laparoscopy reduced the postoperative

hospital stay and the infection rate in the perioperative period but increased the operative time, enterotomy, and postoperative pain [11]. Similarly, in the study of the duration of hospital stay, recurrence, complication and infection rates were found to be lower in the laparoscopic group, but the operation time was also found to be shorter in the laparoscopic group in this study [10]. In our study, the operation time was found to be significantly higher in the open surgery group compared to the lap group, and the length of hospital stay was found to be significantly higher. In the open surgery group, skin necrosis developed in one patient, which caused a prolonged hospital stay (15 days). Prolonged ileus developed in two patients, 3% in the open group and zero in lap surgery, regressed with conservative follow-up. One patient who underwent open surgery was operated on due to the development of ileus in the fifth month after surgery. Iridotomy, partial small bowel resection and end- to-end anastomosis were performed in the patient with severe adhesions in the abdomen. When the other complications in the current study were reviewed the patient repair by Laparoscopic surgery had seroma, wound dehiscence and, surgical site infection at the rate of 3%,1%,1%, respectively. On the other hand, open surgery complications were seroma, wound dehiscence and, surgical site infection at the rate of 10 %, 6 %, 5 %, respectively. On comparing the complications with other studies, it was observed that the seroma development was observed in 8-17% of laparoscopic cases. [5], [12] it was seen in 0-66 % of cases that underwent laparotomy [5]. In terms of recurrence, there was a difference between laparoscopic 1 % and open surgical procedures 3 %. It was determined that the essential factor was previous hernia surgery.

The most important limitation of our study is that it is a retrospective and non-randomized study. We believe that Laparoscopy can be performed safely with high patient satisfaction, except for very large ventral hernias (≥ 15 cm).

5. CONCLUSIONS

On the basis of our study, it can be concluded that the laparoscopic approach is an effective alternative for the repair of primary and incisional ventral hernias. The laparoscopy was found to be showing less complications with the requirement of shorter hospital stay time and requirement of no drain over the open surgery method.

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7. REFERENCES

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