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Brief Communication

Outcomes of Laparoscopic Transabdominal Surgery for Incarcerated Obturator Hernia: A Two-Layer Suture Method

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SUMMARY

First-line treatment of obturator hernia is emergent surgery. The present study investigated the safety, feasibility and effectiveness of laparoscopic surgery for obturator hernia using a modified laparoscopic transabdominal technique with two-layer suture. This study included four female patients with CT-confirmed obturator hernia who received a modified laparoscopic transabdominal technique with two-layer suture between March 2014 and March 2019. All data were analyzed retrospectively, including patients' demographic and clinical characteristics, perioperative details, mortality, and recurrence. Patients' mean age was 88 years. Mean operative time was 150 min and 79 min for patients with and without bowel resection, respectively. Mean hospital stay was 19 days. Mean follow-up was seven years. No major complications or recurrence were reported in these patients during the follow-up period. One patient expired during hospitalization due to pneumonia and heart failure. Results of this study demonstrate the advantages of lower mortality and recurrence associated with the laparoscopic transabdominal technique with two-layer suture approach compared to the open approach. The use of laparoscopic transabdominal technique with two-layer suture is a safe and feasible minimally invasive strategy that allows simultaneous diagnosis and treatment of occult hernias during the same procedure.

1. Introduction

Obturator hernia is the protrusion of either intraperitoneal or extraperitoneal contents through the obturator canal,[1] accounting for 0.5%–1.4% of all hernias.[2,3] Although obturator hernia is rare, it has the highest mortality rate among all hernias.[4] Obturator hernia most commonly affects women aged 70–90 years,[5–7] particularly those who are multiparous, emaciated, and with increased intra-abdominal pressure.[6]

Although computed tomography (CT) scanning has improved the preoperative diagnosis rate of obturator hernia from 43% to 90%,[8] it is not always possible to diagnose all obturator hernias using abdominal CT, sometimes resulting in delayed treatment, which may contribute to greater morbidity and mortality.[9] Hence, early diagnosis and treatment are imperative to avoid post-treatment morbidity and mortality.

Obturator hernia can be treated using conventional open surgery or using laparoscopic surgery.[5] Recent studies have demonstrated the feasibility and effectiveness of laparoscopic surgery for obturator hernia,[5] which offers surgeons the advantage of improved vision in the pelvis compared to open approaches.[10] Nevertheless, those studies of laparoscopic surgery have relatively small samples. Therefore, the choice of treatment for obturator hernia still remains controversial. Herein, we report a new laparoscopic transabdominal procedure with two-layer suture for the surgical treatment of four patients with obturator hernia.

2. Methods

2.1. Study sample

This case series study included 4 female patients with obturator hernia who each received a surgical treatment of laparoscopic transabdominal procedure with two-layer suture between March 2014 and March 2019. The study protocol was approved by the Internal Research and Ethics Committee of MacKay Memorial Hospital (23 MMHIS492e). Patient characteristics, operative details, methodology of repair, incidence of complications, mortality and recurrence were reviewed.

2.2 Surgical technique

To perform the procedure of laparoscopic transabdominal two-layer suture, a 10 mm port is used for the camera (35-degree oblique laparoscope) at the umbilicus incision and two 5-mm ports are used for reduction of the incarcerated intestine and repairing the hernia. After pneumoperitoneum, the patient is positioned in the Trendelenburg posture. Reduction of the incarcerated organ is done first (Figure 1). Mini laparotomy is added at the umbilicus incision for patients who required intestinal resection. Subsequently, the intestine is pulled through and resected. The hernia sac is retracted into the peritoneal cavity (Figure 2). The defect is initially sutured with V-Loc, and is then sutured with the adjacent tissue as a second layer (Figure 3).

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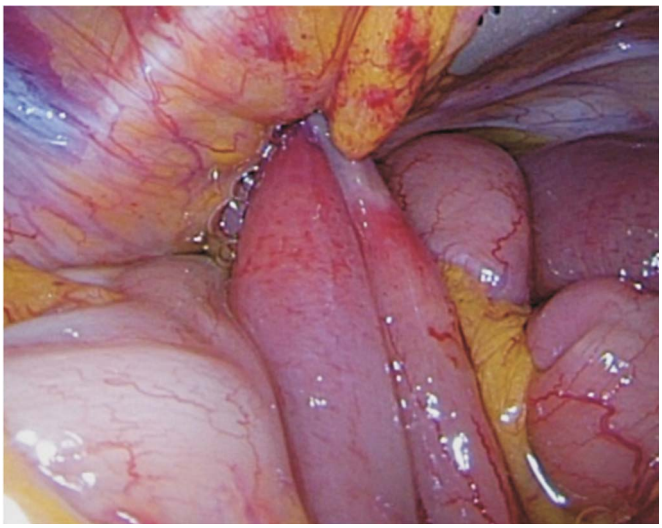

Figure 1. Reduction of the incarcerated small intestine.

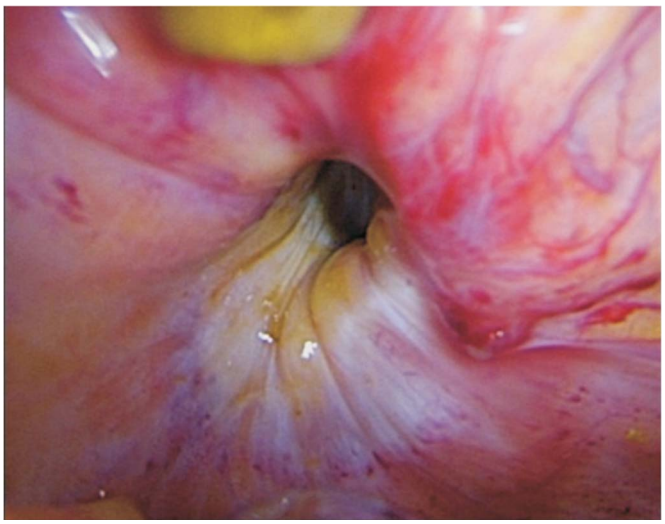

Figure 2. Hernia sac was retracted into the peritoneal cavity.

2.3. Statistical analysis

By the Microsoft Excel (Redmond, WA, USA), continuous variables are presented as means with corresponding standard deviation (SD).

3. Results

All patients sought emergency treatment because of the clinical symptoms of abdominal pain and abdominal bloating, and showed intestinal obstruction and mild elevation of WBC level on abdominal x-ray and laboratory examination. Ileus due to obturator hernia was seen on CT scan (Figure S1), thereby indicating the necessity of surgical treatment.

As shown in Table 1, none of the four patients required conversion surgery due to strangulated intestine. All patients were female, with mean age of 88 ± 6.8 years. The mean weight was 40 ± 1.8 kg while mean body mass index was 16.7 ± 0.4 kg/m^2. Individual patients had medical history of chronic kidney disease (case 2), hypertension (case 2), heart failure (CHF) (case 1 and case 2), diabetes mellitus (DM) (case 4), and stroke (case 3). All patients had intestinal obstruction and two of them underwent bowel resection.

During the process of the operation, one (25%) right and three (75%) left unilateral obstructed obturator hernias were detected (Table 2). None of the patients were found to have occult contralateral obturator hernias. The mean operating time was 114.5 ± 47.8 min and 79 ± 4.2/150 ± 42.4 min (without and with bowel resection, respectively). One patient expired during hospitalization due to pneumonia and heart failure. No major complications were reported. The postoperative period of the other three patients was uneventful with no recurrence observed during the follow-up period (7 ± 3 years).

4. Discussion

The axiom "Hernia of a skinny old lady" aptly describes the phenotype of the obturator hernia, which is found in older adult women who are emaciated.[5–7] A similar observation was also found in the present study in which all patients were female with a mean age 88 years. Obturator hernia has a female predilection because women have a broader pelvis with a larger triangular obturator canal opening with a greater transverse diameter.[5,11] Other risk factors strongly

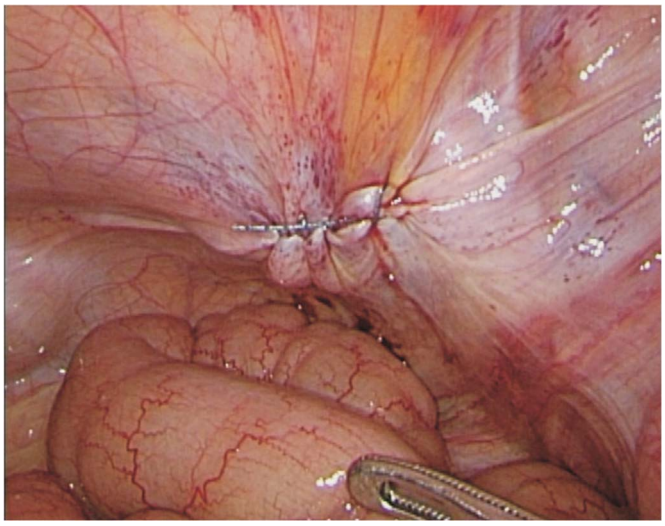

Figure 3. Two-layer suture repair.

associated with obturator hernias are: prior pregnancy,[10] emaciated,[6] multiparous[6] and patients with increased intra-abdominal pressure.[6] Such factors may cause loosening of the pelvic floor or atrophy/loss of the pre-peritoneal fat around the obturator vessels, favoring the onset of the hernia. The clinical presentation is often nonspecific, resulting in difficultly determining a preoperative diagnosis and contributing to a high mortality rate of 11%–50%.[12]

Two signs are used to indicate obturator neuralgia, the Howship-Romberg sign and the Hannington-Kiff sign are described as specific for a strangulated obturator hernia.[10] Ultrasound, CT, and MRI are all useful in the diagnosis of obturator hernia. In particular, the CT scan is highly specific for the diagnosis of abdominal pain, with accuracy above 90%.[13] Hence, in the present study, preoperative CT examination confirmed the diagnosis of incarcerated obturator hernia in all patients. The CT exam is useful in defining the relationship of the sac to the muscles overlying the obturator foramen and identifies the type of hernia, which is crucial when approaching the hernia from the groin during laparoscopic surgery.

The standard treatment approach for obstructed obturator hernia is early surgery. The conventional approach is open surgery, usually with lower middle incision, in order to obtain a definitive diagnosis and gain enough exposure to identify the hernia sac entering the defect and to perform bowel resection, if necessary.[14]

Table 1
Characteristics and descriptive data of the study population.

Variables	Case 1	Case 2	Case 3	Case 4	Mean ± SD
Age (year)	97	81	89	85	88 ± 6.8
Gender	Female	Female	Female	Female	
Height (cm)	156	149	158	155	154.5 ± 3.9
Body weight (kg)	41	38	42	39	40 ± 1.8
BMI (kg/m^2)	16.8	17.1	16.8	16.2	16.7 ± 0.4
Medical history					
Chronic kidney disease		v			
Hypertension		v			
Heart failure	v	v			
DM				v	
Stroke			v		
Presence of intestinal obstruction	Yes	Yes	Yes	Yes	
Duration of symptoms (day)	2	1	1	3	1.8 ± 1.0
Pre-operative CT scan	Yes	Yes	Yes	Yes	

BMI, body mass index; CT, computed tomography; DM, diabetes mellitus; SD, standard deviation; v, yes.

Table 2
Operation details and postoperative outcome.

Variables	Case 1	Case 2	Case 3	Case 4	Mean ± SD
Side of obturator hernia	Left	Right	Left	Left	
Bowel resection	Yes	No	No	Yes	
Operation time (min)	120	76	82	180	114.5 ± 47.8 (without/with bowel resection: 79 ± 4.2/150 ± 42.4)
Mortality	No	Yes[a]	No	No	
Recurrence	No	No	No	No	
Follow up period (year)	7	Expired	10	4	7 ± 3

SD, standard deviation. [a] Death due to pneumonia and heart failure.

However, prior study indicates a high mortality rate with open surgery, especially in elderly patients with comorbid lung and heart conditions.[10] Moreover, previous study shows a recurrence rate of 10% for sutured repair versus 2% for mesh repair in open surgery.[15] In contrast, the laparoscopic approach is being performed increasingly in recent years and the key advantage of the laparoscopic approach is its minimally invasive nature.[16,17] In addition, the laparoscopic approach, as used in elective and emergency repairs, has lower postoperative complication rates and post-operative hospital length of stay (LOS).[5,11] This approach, however, is restricted to stable patients with no previous laparotomies or major abdominal distension.[5]

Using a large prosthetic mesh within the preperitoneal space may be advantageous for covering the obturator orifice, as well as the femoral and inguinal regions.[18] However, the introduction of synthetic mesh is associated with a considerable risk of infection, particularly in cases of gross contamination or when bowel resection is required. Moreover, herniorrhaphy involving mesh placement in the obturator canal may lead to the development of obturator neuralgia. Consequently, we advocate for direct suturing repair whenever feasible. The present study has expanded the previous study of obturator hernias with laparoscopic surgery and further employed a new laparoscopic transabdominal procedure with two-layer suture for the incarcerated obturator hernia, since careful positioning and skilled suture techniques are imperative to repair obturator hernia laparoscopically. Although patients with obturator hernias are typically older adults, our laparoscopic transabdominal procedure had a similar operative time (without bowel resection: 79 min) to that of another study with laparoscopic surgery performed in elderly patients.[19] This may greatly reduce concerns of pneumoperitoneum-related complications.[19] All patients in the present study had no major complications and are completely recovered, except one patient who expired due to non-obturator hernia-specific heart failure complicated by pneumonia. No instances of recurrence were noted during the follow-up period.

Intestinal obstruction, commonly seen in patients with incarcerated obturator hernia, may make the laparoscopic approach difficult. In patients with bowel strangulation that required bowel resection, a mini-laparotomy incision can be made to assist the operation,[5] that is, laparoscopic-assisted bowel resection. Laparoscopic-assisted bowel resection is technically more difficult. It is not feasible if the hernia failed to be reduced laparoscopically, or when the bowel is markedly dilated, preventing the safe insertion of laparoscope and instruments. The procedure is also more difficult when using the extraperitoneal approach. However, it is a valuable option in selected appropriate patients. Two patients in the present series had intraperitoneal repair with laparoscopic-assisted small bowel resection. Our data show that these two patients had no recurrence or death during long-term follow-up (4–7 years).

The main limitation is the relatively small sample and the retrospective study design, which limits the extent to which results can be generalized to other populations and does not rule out selection bias. However, we chose a longer follow-up period to yield more robust results. Further studies with larger samples are needed to validate the efficacy of our laparoscopic transabdominal procedure with two-layer suture for managing obturator hernia.

5. Conclusion

The use of laparoscopic transabdominal technique with two-layer suture method is a safe, feasible and effective minimally invasive strategy that allows simultaneous diagnosis and treatment of occult hernias during the same procedure with lower mortality and recurrence than the open approach.

Conflicts of interest

Not applicable.

Funding

Not applicable.

Supplementary materials

Supplementary materials for this article can be found at http://www.sgecm.org.tw/ijge/journal/view.asp?id=37.

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