

Case Report

Outcome of emergency laparoscopic simple closure technique for incarcerated obturator hernia in our hospital: a study of postoperative cases more than 5 years after surgery

Yoshihisa MORISAKI¹, Shoichiro SUZUKI¹, Kazuo HASE¹ and Yutaka YOSHIZUMI¹

J. Natl. Def. Med. Coll. (2026) 51 (3) : 98 – 105

Abstract: Obturator hernia is relatively rare, occurs mostly in elderly, thin women and requires surgical intervention. Recently, minimally invasive treatments have been pursued. Since 2013, simple laparoscopic closure of the hernial orifice has been conducted as an emergency procedure for incarcerated obturator hernia. Herein, we examined the treatment outcomes of eight patients in whom this surgical procedure was performed and more than 5 years had passed since surgery on December 2024. The average operation time was short, at 47.1 min (21-119 min), and the average postoperative hospital stay was 4.9 days (2-8 days), enabling early patient discharge. No postoperative complications occurred, indicating that the procedure is minimally invasive and safe. However, postoperative recurrence was observed in two patients (25.0%). We report these findings with a literature review.

Key words: incarcerated obturator hernia / laparoscopic surgery / treatment strategy

Introduction

Obturator hernia (OH) is a relatively rare type of pelvic hernia that occurs in older, thin women and accounts for 0.073% of all hernias¹⁾. Recently, the number of patients has increased owing to an aging population and improvements in diagnostic imaging²⁻⁵⁾. Currently, there is no standard treatment strategy for OH²⁻⁴⁾. Recently, minimally invasive treatments have been pursued, as most patients involved are older adults^{2, 6-11)}. Since March 2013, Tokorozawa Meisei Hospital, predecessor adopted a policy of performing emergency surgery for incarcerated obturator hernias as a standard procedure, with simple laparoscopic closure of the hernia orifice. As of June 2019, this procedure has been performed in eight consecutive patients. Herein, we examined the treatment outcomes of eight

patients who had passed more than 5 years since surgery on December 2024.

Materials and methods

Details of the surgical procedures we have performed as emergency surgeries for cases of OH incarceration since March 2013 are follows: A 12 mm camera port was inserted through the umbilicus, and two 5 mm working ports are placed into the left and right lower abdomen. Under laparoscopic observation, the incarcerated small intestine was reduced using external compression or gentle traction of incarcerated small intestine. The hernia sac was then inverted into the abdominal cavity and performed high ligation with an endoloop (Ethicon ENDOLOOP® Ligature made with PDS® II; Fig. 1). At this point, we confirmed that the obturator nerve and

¹Tokorozawa Mihara General Hospital, Tokorozawa, Saitama 359-0045, Japan

Received November 28, 2025
Accepted June 9, 2026

obturator artery and vein, faintly visible beneath the peritoneum, are not elevated towards the hernia sac (Fig. 1). When no blood flow disturbances at the incarcerated site of the small intestine was detected, surgery was completed. However, when a blood disorder was detected, a small laparotomy of approximately 5 cm was conducted to resect the ischemic portion of small intestine. When this treatment was first introduced, patients with poor general condition such as low blood pressure, or cases in which excessive intestinal dilation had occurred owing to complete bowel obstruction, were considered ineligible for this procedure. However, in the six

years and three months up to June 2019, there were no cases in which the procedure was not suitable, and the procedure was performed in eight consecutive patients. For these eight patients, as of December 2024, over 5 years had passed since surgery. Their charts were retrospectively reviewed, and the patients were contacted by telephone to check for the presence of an episode of recurrence (Table 1). The average age at the time of surgery was 82.8 years (range 69-93 years). All patients were female, and the affected area was the right in six patients and the left in two. The average Body mass index was 17.5 (range 13.7-21.3). The clinical

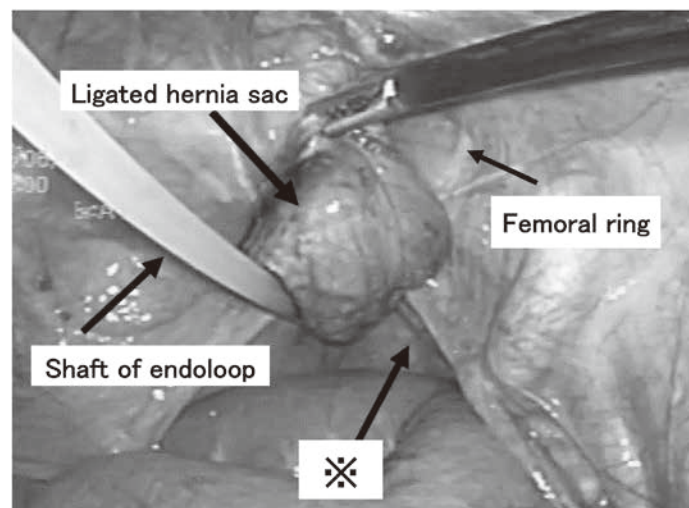


Fig. 1 Intraoperative findings of Case 8

※The obturator nerve and obturator artery and vein, passing through the right side of the hernia sac and running towards the obturator foramen, are visible beneath the peritoneum.

Table 1. Clinical findings and course

	case 1	case 2	case 3	case 4	case 5	case 6	case 7	case 8
Age	88	82	87	87	69	81	93	75
Sex	F	F	F	F	F	F	F	F
BMI (kg/m ²)	—	21.3	—	20	17.1	16.2	13.7	16.4
Affected site	Left	Right	Right	Right	Left	Right	Right	Right
Time from the onset to surgery	within 24h	within 24 h	within 24 h	5 days later	3 days later	within 24 h	within 24 h	within 24 h
Additional Surgery	NE	NE	NE	Intestinal resection	Exploratory laparotomy	NE	NE	NE
Duration of surgery (minutes)	36	38	56	119	54	21	33	20
Postoperative complications	None	None	None	None	None	None	None	None
Postoperative stay (days)	3	3	5	8	8	2	6	4
Recurrence	None	None	None	None	Present	None	None	Present
Postoperative observation period (months)	46	141	15	72	56	81	6	32

NE: not enforced

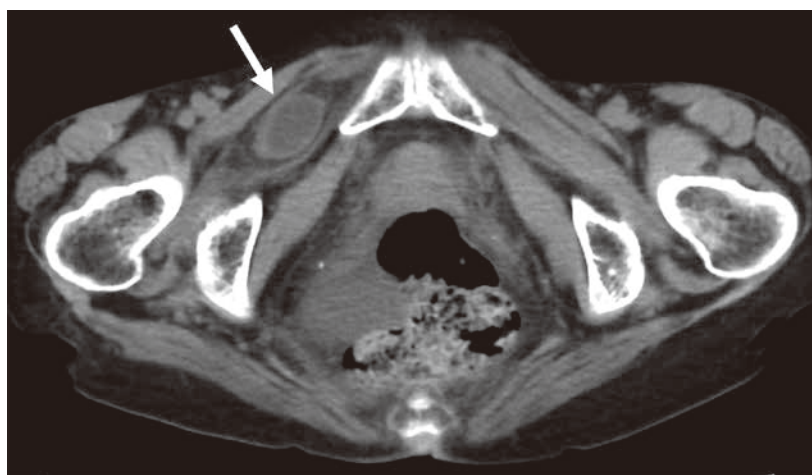


Fig. 2 CT scan findings

CT tomography reveals an incarcerated intestine between the obturator externus and pectineus muscle (arrow).

symptoms were lower abdominal pain and nausea in four patients, lower abdominal pain and vomiting in one patient, and lower abdominal pain in only one patient each, and thigh pain in two patients. In all eight cases, CT images showed a small incarcerated intestine within the obturator canal (Fig. 2), and incarcerated OH was promptly diagnosed. Regarding medical history, only one patient had a history of femoral hernia surgery, and none of the patients had contralateral OH or other inguinal hernias during surgery. The postoperative observation period ranged from 6 months to 141 months. The time from the onset to the start of surgery, whether additional surgery was conducted, duration of surgery, length of postoperative hospital stay, prognosis, presence or absence of complications, postoperative observation period, and presence or absence of a recurrence were examined.

Results

Surgery commenced in all patients within 3 h of arrival at our hospital. The time from onset to the start of surgery was within 24 h in six patients, and over 48 h in two patients (case 4 and 5). Blood flow disturbance was observed in the impacted small intestine in two patients who

had been there for over 48 h after onset. In these two cases in which more than 48 h had passed since the onset of symptoms, the impacted small intestine had turned brown, and it was clearly determined that there was a blood flow disorder. A small laparotomy was performed, and the impacted small intestine was removed from the abdominal cavity and observed for approximately 20 minutes. In case 5, in which surgery was performed 3 days after the onset of symptoms, the color of the impacted small intestine recovered, and it was returned to the abdominal cavity. However, in Case 4, in which 5 days had passed since the onset of symptoms, the color of the impacted small intestine did not improve, therefore, an additional small intestinal resection was performed.

The operative time ranged from 21 to 119 min, with an average of 47.1 min, while it ranged from 21 to 56 min in the six patients who did not undergo additional surgery, with an average of 34 min. The postoperative hospital stay ranged from 2 to 8 days, with an average of 4.9 days, while it ranged from 3 to 6 days in the six patients who did not undergo additional surgery, with an average of 3.8 days. No postoperative complications occurred, including the development of injury of obturator nerve and

obturator artery and vein. Postoperative recurrence occurred in two patients (25.0%). Case 5 experienced recurrence 26 months after surgery, and Case 8 experienced recurrence 12 months after surgery. For the reoperation, a mesh plug was inserted into the obturator canal. The operative time was 99 minutes in Case 5 and 105 minutes in Case 8. There were no postoperative complications, and the patients were discharged on the 7 days in Case 5 and 3 days in Case 8 after surgery. In December 2024, the observation period for the six patients excluding those undergoing reoperation, was over 5 years for three patients, three but less than 5 years for two patients, and less than 1 year (six months) for one. Two of the surviving patients are alive and well without recurrence, 141 months and 81 months postoperatively. The other four patients died of other diseases; however, no recurrence was observed. The two patients who required reoperation died of other diseases 38 months after the reoperation (50 months after the initial surgery) in Case 5 and 4 months after the reoperation (16 months after the initial surgery) in Case 8.

Discussion

OH is more common in older, thin women¹⁾, and all eight patients were older, thin women without exception (Table 1). OH is usually asymptomatic and symptoms appear only when the intestine becomes incarcerated. Most patients with incarcerated obturator hernia complain of abdominal pain, nausea and vomiting due to intestinal obstruction, and about half pain medially and proximally in the thigh during hip internal rotation, known as the Howship-Romberg sign, caused by irritation of obturator nerve^{4-8, 12)}. Computed tomography (CT) scan is essential for a positive diagnosis. All eight patients presented with these symptoms and CT scans showed typical findings, leading to a definitive diagnosis of incarcerated OH. In compiling reports of cases in Japan, Shiomi et

al.¹²⁾ reported 387 cases between 1973 and December 1994, whereas Kono et al.⁴⁾ reported 253 cases between January 1995 and December 2000. It is clear that with improvements in diagnostic accuracy, primarily through CT scans, the intestinal resection rate decreased from 57.7% to 49.8%, and the mortality rate decreased from 5.5% to 3.9%, comparing these two complications from different eras. Conversely, the preoperative accuracy rate has improved dramatically with the use of CT; nevertheless, some reports on the intestinal resection rate, postoperative complications, or in-hospital mortality rate remain the same¹³⁻¹⁵⁾. Generally, in cases where surgery is conducted early after onset, the intestinal resection rate is low and postoperative complications are few^{6, 16)}. Reportedly, the mortality rate in cases where intestinal resection was conducted was three times higher than in cases where intestinal resection was not performed¹⁷⁾. Thus, early detection and treatment are essential for treating OH, because delayed detection is associated with a high risk of death¹⁸⁾. To prevent delays in detection, it is essential to perform CT scans up to the pelvis in patients suspected of having intestinal obstruction, and raise awareness about OH among medical departments other than surgery^{15, 19)}.

There are many options for treating OH, including post-diagnostic management, surgical approaches, and hernia repair methods; currently, no standard treatment exists²⁻⁷⁾. The emergency open approach has traditionally been the norm^{2, 5, 6, 14-18)}. Recently, there has been a trend toward less invasive procedures^{2, 6-11)}. Consequently, the number of hospitals that primarily conduct emergency laparoscopic surgery has increased^{7, 8, 11)} and the number of hospitals that have adopted a policy of noninvasive reduction instead of emergency surgery has also increased^{9, 10, 20, 21)}. The open approach has the advantage of being able to perform definitive diagnosis and, if necessary,

bowel resection, hernial repair, and contralateral exploration with certainty²⁻⁴⁾; however, laparoscopic surgery offers almost all the advantages of the open approach^{2, 8)}. It is likely that the laparoscopic approach will become the first choice for emergency surgery in many hospitals. We performed this laparoscopic procedure as an emergency surgery was conducted on eight patients of incarcerated OH. Consequently, there were no postoperative complications or in-hospital deaths, and all patients were discharged within a short period. While this result is partly due to the absence of patients with poor general condition and the fact that only one case (12.5%) involved small bowel resection, we believe that the series of treatments conducted using this laparoscopic technique, beginning with emergency surgery, contributed to reducing surgical invasiveness and ensuring safety. However, the fact that postoperative recurrence was observed in two patients (25.0%) warrants further investigation.

Recurrence is associated with hernia orifice repair. Gray et al.²²⁾ reported a 7% recurrence rate when the hernia orifice was left untreated, and that recurrence did not necessarily occur even when the hernial orifice was not treated. However, it is generally considered that hernia orifice repair should be conducted as part of a radical surgical procedure⁴⁾. Miyahara et al.⁵⁾ conducted simple suture closure in 13 of 21 open cases (62%) with no reported of postoperative recurrence, making it a simple and useful method. However, the recurrence rate is high in cases where the hernial orifice is simply sutured, or the uterus or ovaries are covered during the initial surgery^{3, 7, 8, 16)}. Recently, mesh has become the mainstream method for cases without intestinal resection or contamination from the perspective of recurrence²³⁾. Meanwhile, six patients aged 80 years or older showed no recurrence over a relatively long follow-up period. This single closure of the hernial orifice with Endoloop[®], is a simple procedure that can

be completed in a short time. However, the recurrence rate was high (25.0%). Two recurrences occurred in patients aged 69 and 75 years at the time of the initial surgery. Six patients aged 80 years or older were followed up for relatively long periods, with three cases lasting more than five years (the longest was 141 months) and two cases lasting more than three years but less than 5 years. Based on our limited experience, we hoped that recurrence is rare in patients 80 years or older with laparoscopic simple closure alone. However, in reports using the same simple closure method as ours, Amiki et al.²⁴⁾ reported recurrence in an 89-year-old woman, and Oyama et al.¹⁹⁾ reported recurrence in a 96-year-old woman, 85-year-old woman, and 80-year-old woman. The recurrence time ranged from 6 to 54 months, and all four patients underwent reoperation using the TAPP (trans-abdominal preperitoneal repair) technique. Based on these findings, this procedure alone may be sufficient for a large number of cases; however, it is considered a procedure with less radical potential. Therefore, our simple closure technique appears to be more suitable for cases in which the patient's general condition necessitates the rapid completion of surgery or intraperitoneal contamination. It is generally recommended that a mesh be used to prevent recurrence. Mesh-based methods for preventing recurrence include inserting a mesh plug into the obturator canal^{7, 9, 10)}, providing localized mesh reinforcement around the hernial orifice^{11, 25)}, and the TAPP technique^{8, 19, 24, 26)}, which involves extensive mesh coverage to prevent the recurrence of other hernias. Furthermore, there are cases of death from other diseases in the early postoperative period, as in Case 6¹¹⁾. The existence of such cases suggests that OH is common in elderly patients with many comorbidities, and that surgical procedures should be selected with careful consideration of the balance between cure and safety. Furthermore, as pointed out by Oeda et al.¹²⁾, elderly patients and

their families may find it difficult to accept a second-stage surgery. Therefore, we believe that a first-stage procedure that can prevent recurrence in a short period is desirable. Chihara et al.²⁶⁾ reported that the TAPP procedure had significantly lower complication rates and hospital stays, a 0% mortality rate, and was an effective, safe, and desirable method. In contrast, some suggest that TAPP, which involves extensive peritoneal dissection and long operative time should be avoided as an emergency surgical procedure where minimal invasiveness is required^{11, 19)}. However, methods such as inserting a mesh plug into the obturator canal, the circular circumferential dissection method proposed by Oeda et al.¹¹⁾, and the ventral peritoneal attachment method²⁵⁾ have shorter operative times and should be considered first-line options in the future. Furthermore, they believe that the TAPP procedure should be considered a secondary procedure in cases involving bilateral or other inguinal hernias²⁰⁾.

Recently, there have been many reports on the usefulness of noninvasive reduction techniques²¹⁻²³⁾. An increasing number of institutions are using non-invasive reduction techniques to avoid emergency surgery, primarily electing elective surgery, and then conducting emergency surgery if reduction is not possible or perforation is suspected^{10, 12)}. Kamihata et al.²¹⁾ devised a noninvasive reduction technique called Four-Hand Reduction for Incarcerated Obturator Hernia Under Guidance of Sonography, which uses ultrasound. Reduction was successful in all 13 cases using this technique, and that no emergency surgery was required since the technique was introduced. An increasing number of institutions are now using noninvasive reduction techniques to avoid emergency surgery, with emergency surgery conducted if reduction is not possible or perforation is suspected^{10, 18)}. This approach will likely become the core of future OH treatment strategies. Furthermore, when elective surgery

is considered, there are more surgical options available, such as the inguinal approach and the femoral approach, which can be performed without general anesthesia^{9, 10)}. In the future, noninvasive reduction should be actively considered as the initial treatment for OH. Although we have no prior experience with noninvasive reduction, we plan to try it as an initial treatment for OH in the future. When emergency surgery is unavoidable, laparoscopic surgery is the norm, our minimally invasive and simple procedure may be a useful method particularly in cases of poor general condition or intraperitoneal contaminations.

Conclusions

Emergency laparoscopic hernial orifice closure treatment is considered a simple and safe procedure. Although the recurrence rate is high with this surgical procedure alone, it is believed that a considerable number of cases can expect a complete cure with this procedure alone. Further research is needed to determine which cases fall into this category. At present, it was considered to be a useful method particularly in cases of poor general condition or intraperitoneal contamination.

Conflict of interest

The authors declare no conflict of interest associated with this manuscript.

Acknowledgements

We would like to thank Honyaku Center Inc. for English Language editing.

References

- 1) Bjork KJ, Mucha P, Chahill DR.: Obturator hernia. *Surg Gynecol Obstet.* 167: 217-222, 1998.
- 2) Yamaura K, Kato K, Misawa R, et al.: A case of bilateral obturator hernia repaired by laparoscopic surgery. *J.Jpn.Soc.Endosc.Surg.* 6: 251-255, 2001.
- 3) Irisawa Y, Koshiishi N, Inoue A, et al.: The utility of mesh plug in obturator hernia repair: review of 35 cases of obturator hernia in our hospital. *Kitasato Med J.* 43: 45-49, 2013.
- 4) Kono T, Hyuga T, Honda Y.: Obturator hernia-A

- statistical study of 257 domestic cases in the past six years- . *J Jpn Surg Assoc.* 63: 1847-1852, 2002.
- 5) Miyahara Y, Yokoyama M, Yoshida A, et al.: Clinical features and surgical treatment of obturator hernia *Surgery.* 79: 867-871, 2017. (in Japanese)
 - 6) Yoshida M, Yanagisawa S, Kataoka M, et al.: Predictors of bowel resection for incarcerated obturator hernias. *J Jpn Surg Assoc.* 78: 1955-1961, 2017.
 - 7) Takai A, Inoue H, Iwakawa K, et al.: Laparoscopic herinia repair with mesh plug for recurrent obturator hernia: a case report. *J.Jpn.Soc.Endosc. Surg.* 13: 417-421, 2008.
 - 8) Wakabayashi M, Kohno S, Sasaki K, et al.: A case of incarcerated obturator hernia with ileus treated by laparoscopic hernia repair. *J Jpn Surg Assoc.* 77: 1848-1853, 2016.
 - 9) Sugiyama Y, Nomimura T, Yamnaka K, et al.: Two case of obturator hernia performed elective surgery after noninvasive reduction. *Jpn. J. Gastroenterol. Surg.* 43: 122-127, 2010.
 - 10) Fujii K, Yamamoto Y, Takami Y, et al.: Experience of surgery under local anesthesia for incarcerated obturator hernia following non-invasive reduction. *J Jpn Surg Assoc.* 84: 1700-1706, 2023.
 - 11) Oeda Y, Okaya T, Nakamura Y, et al.: Usefulness of laparoscopic circular dissection of the area surrounding an obturator hernial orifice. *J Jpn Surg Assoc.* 85: 1176-1182, 2024.
 - 12) Shiomi H, Watanabe E, Ueda T, et al.: A case report of right obturator hernia with acute appendicitis. *J Jpn Surg Assoc.* 57: 1490-1493, 1996.
 - 13) Yokoyama Y, Yamaguchi A, Isogai M, et al.: Thirty-six cases of obturator hernia: does computed tomography contribute to postoperative outcome?. *Word J.Surg.* 23: 214-216, 1999.
 - 14) Iwata T, Isogai M, Harada T, et al.: Clinical evaluation of 61 cases of obturator hernia. *J Jpn Surg Assoc.* 75: 2073-2078, 2014.
 - 15) Kanazawa N, YOKOYAMA Y, Yoshida T, et al.: Obturator hernia. *J Jpn Surg Assoc.* 69: 2168-2172, 2008.
 - 16) Udaka T, Tanaka S, Hashimoto K, et al.: Examination of surgical treatment for obturator hernia. *J.abdo.emerg.med.* 33: 937-940, 2013.
 - 17) Itoh S, Kubo A, Yamanouchi T, et al.: A case of recurrent obturator hernia which occurred twice. *J Jpn Surg Assoc.* 55: 1293-1296, 1994.
 - 18) Igari K, Ochiai T, Aihara A, et al.: Clinical presentation of obturator hernia and review of the literature. *Hernia.* 14: 409-413, 2010.
 - 19) Oyama K, Kato K, Sato K, et al.: Investigation of emergency laparoscopic surgery for incarcerated obturator hernia. *J.Jpn.Soc.Endosc.Surg.* 22: 495-501, 2017.
 - 20) Takagi I, Fujii Y.: Three cases of incarcerated obturator hernia reduced by the femoral pressure method. *J Abdo Emerg Med.* 33: 1289-1293, 2013.
 - 21) Kamihata K, Nagahisa Y, Togawa Y, et al.: A new repositioning maneuver for incarcerated obturator hernia. *Jpn.J.Gastroenterol.Surg.* 55: 1-9, 2022.
 - 22) Gray SW, Shandalakis JE, Soria RE, et al.: Strangulated obturator herinia. *Surgery.* 75: 20-27, 1974.
 - 23) Burla MM, Gomes CP, Calwi I, et al.: Management and outcomes of obturator hernia: a systematic review and meta-analyses. *Hernia.* 27: 795-806, 2023.
 - 24) Amiki M, Goto M, Tomizawa Y, et al.: Laparoscopic transabdominal preperitoneal hernioplasty for recurrent obturator hernia: a case report. *Asian J Endoscop Surg.* 13: 457-460, 2020.
 - 25) Ishibashi R, Ishikawa N, Kawaguchi M, et al.: A case of laparoscopic obturator hernia using C-QUR Edge™. *J Abdo Emerg Med.* 32: 993-995, 2012.
 - 26) Chihara N, Suzuki H, Sukegawa M, et al.: Is the laparoscopic approach feasible for reduction and herniorrhaphy in cases of acutely incarcerated/strangulated groin and obturator hernia?: 17-year experience from open to laparoscopic approach. *J Laparoendosc Adv Surg Tech A.* 29: 631-637, 2012.

当院における閉鎖孔ヘルニア嵌頓症例に対する腹腔鏡下单純閉鎖術の治療成績 —術後5年以上経過例の検討—

森崎善久¹, 鈴木昭一郎¹, 長谷和生¹, 吉住 豊¹

防医大誌 (2026) 51 (3) : 98–105

要旨：閉鎖孔ヘルニアは高齢のやせた女性に多いことで知られ，外科手術を要する比較的稀な疾患である。近年は，低侵襲治療が追求されている。われわれは，嵌頓閉鎖孔ヘルニアに対して2013年以降は緊急手術を基本として腹腔鏡下にヘルニア門の単純縫縮術を行ってきた。本治療を行い2024年12月の時点で5年以上を経過した8例を対象に治療成績を検討した。その結果，手術時間は平均47.1分（21分～119分）と短く，術後入院期間は平均4.9日（2日～8日）と早期に退院可能であった。術後合併症は生じず，低侵襲かつ安全な治療法と考えられたが，術後再発が2例（25.0%）に認めた。文献的に考察を加えて報告する。

索引用語： 閉鎖孔ヘルニア嵌頓 / 腹腔鏡手術 / 治療戦略

¹ 所沢美原総合病院