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Laparoscopic totally extra-peritoneal hernia repair for bilateral Spigelian hernias and coincident inguinal hernia: A case report

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ABSTRACT

INTRODUCTION: Spigelian hernia (SH) is a rare ventral hernia occurring near the lateral border of the rectus muscle. The treatment remains controversial and depends on institutional expertise. Although laparoscopic surgery is a good adaptation for the repair of ventral hernias, only a few cases have been reported in the literature. Here, we report a case of totally extra-peritoneal (TEP) repair for bilateral SHs. **PRESENTATION OF CASE:** A 74-year-old Japanese man presented with asymptomatic bulges in the right lower abdominal quadrant. On physical examination, the bulges were located to the right of the lateral border of the abdominal rectus muscle and the right inguinal region in an upright position. We diagnosed right SH and coincident homonymous ipsilateral inguinal hernia (IH) by abdominal computed tomography and planned a curative operation by laparoscopy. By first laparoscopic exploration, we found an asymptomatic SH to the left of the lateral border of the abdominal rectus muscle and performed TEP repair for all hernias. The second laparoscopic exploration after fixing the mesh in place revealed that the orifice of the right SH was scarred and stiffened by repeated prolapse. We finally eliminated the sac by ligation because of a fear causing of reduction en masse of the SH.

DISCUSSION AND CONCLUSION: The use of laparoscopy simplified the diagnosis and facilitates the subsequent repair of the hernia. TEP approach is the ideal treatment for the simultaneous laparoscopic repair of SH and IH.

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1. Introduction

Spigelian hernia (SH) is a rare ventral hernia occurring near the lateral border of the rectus muscle. It is reported that SHs constitute less than 2% of all abdominal wall hernias and are identified as a cause of intestinal obstruction from incarceration [1]. Although laparoscopic surgery is a good adaptation for the repair of ventral hernias, only a few cases have been reported in the literature. Furthermore, laparoscopic totally extra-peritoneal (TEP) repair for SH is even more rare [2]. Here, we report a case of TEP repair for bilateral SHs, of which one was symptomatic and the other asymptomatic, and discuss the importance of laparoscopic exploration from the intraperitoneal perspective.

2. Presentation of case

A 74-year-old Japanese man who was undergoing investigation for lumbar spinal canal stenosis presented with asymptomatic bulge in the right lower abdominal quadrant. A period of 10 years had passed since he first noticed the bulge, although there had been no particular symptoms during that period. On physical examination, the bulge about the size of his fist was located to the right of the lateral border of the abdominal rectus muscle in an upright position. The bulge was reducible by hand in a recumbent position. Furthermore, a small bulge, which the patient had been unaware of, was also observed in the right inguinal region. The patient had no history of abdominal surgeries or abdominal trauma. Abdominal computed tomography (CT) revealed a small fascial defect and intestinal prolapse from the abdominal cavity to the right of the lateral border of the abdominal rectus muscle, which was identified as SH and right inguinal hernia (IH) (Fig. 1a,b). From this examination, we diagnosed right SH and coincident homonymous ipsilateral IH and planned a curative operation by laparoscopy.

We first observed the attribution and position of the hernia orifice intraperitoneally by laparoscopic exploration from

Abbreviations: SH, spigelian hernia; TEP, totally extra-peritoneal; IH, inguinal hernia; CT, computed tomography; PS, preperitoneal space; PE, peritoneal edge.

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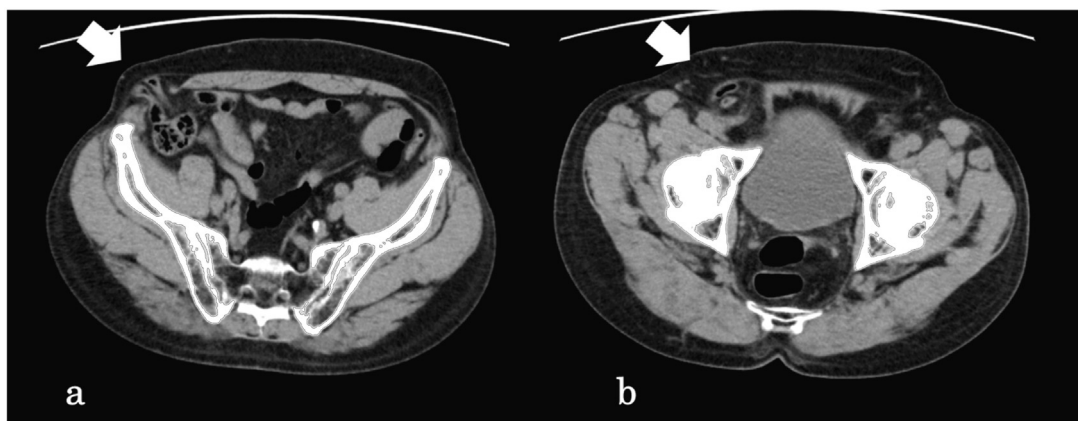


Fig. 1. Computed tomography showing right Spigelian hernia (1a) and right inguinal hernia (1b) (arrowheads).

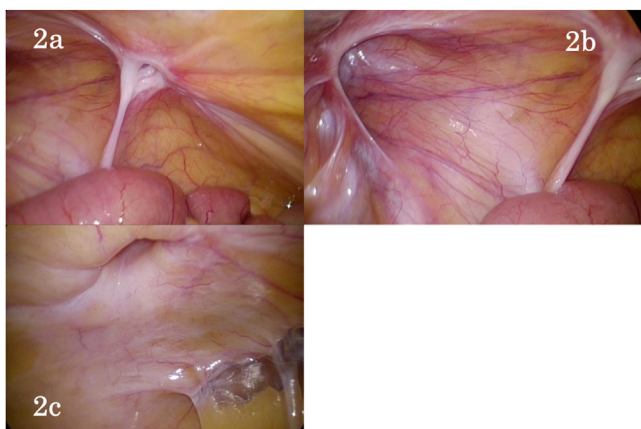


Fig. 2. The first laparoscopic exploration photograph. The orifices of right Spigelian hernia (2a), right inguinal hernia (2b), and left asymptomatic Spigelian hernia (2c) were seen.

umbilical small incised wound. We confirmed the orifice of the right SH (Fig. 2a) but also noticed that not only was the right IH an indirect one (Fig. 2b) but there was also an asymptomatic SH to the left of the lateral border of the abdominal rectus muscle (Fig. 2c). Because both orifices of the SHs were caudal apart from the umbilicus, we determined that all hernias were curable by TEP repair.

After finishing the laparoscopic exploration, we performed a standard extra-peritoneal procedure, which involved dissecting the preperitoneal space (PS) by balloon trocar from small wound just under the umbilicus. We began manipulation after the detainment of two operating thin trocars at the suprapubic region and the middle of the pubic bone and navel. We proceeded with the repair from the right side of the SH and IH. The SH, which had prolapsed from the aponeurosis (Fig. 3a), was detected at the lateral side of the prolapsed region of the IH and the sac and peripheral adipose tissue to the PS were immediately removed (Fig. 3b). Then we focused on the IH and detected the right inferior epigastric vessel, seminal duct, and testicular blood vessel. We separated the IH sac from these important organs and returned enough peritoneal edge (PE) to the PS (Fig. 3c). Also on the left side, we confirmed the SH and removed the sac and peripheral adipose tissue. After peeling back the PE of the left side, we inserted a polypropylene mesh to the PS, and spread and fixed this to the Cooper's ligament or aponeurosis of the transversus abdominis muscles using a surgical stapler (Fig. 3d).

After the mesh was fixed in place, we again observed the orifice from the intraperitoneal view. The second laparoscopic exploration

revealed that the orifice of the right SH was scarred and stiffened by repeated prolapse (Fig. 4a). The diameter of the orifice was as small as about 1 cm. On the other hand, the orifice peritoneum of the left SH had reversed and became undone (Fig. 4b). We decided that the stiffened small orifice could possibly cause reduction en masse of the SH. We were able to eliminate the sac by ligation at the PS (Fig. 4c). The operation was concluded after a drain was placed at the PS. The total operative time was 95 min, and there was only a very small amount of bleeding.

The drain was removed 2 days later and the patient was discharged from the hospital on postoperative day 3. Routine follow-ups were performed, and no morbidity was encountered due to the procedure (Fig. 5).

3. Discussion

SH is a hernia caused by a defect in the Spigelian fascia, which exists between the semilunar line and the edge of the rectus abdominis muscle. SH accounts for 0.12–2% of all abdominal wall hernias [3]. Klinkosch first defined the SH as a defect in the semilunar line in 1764 [4]. This type of hernia occurs anywhere on the Spigelian fascia, although it is reported that more than 90% of these hernias occur in the Spigelian hernia belt, which is a transverse zone (6 cm wide) located above the interspinal plane [5]. Although the cause of SH is unknown because of its rarity, its development may be linked to multiple factors such as collagen disorders, aging, obesity, rapid weight loss, multiple pregnancies, chronic obstructive pulmonary diseases, trauma, surgical history, and congenital diseases [6]. It is difficult to diagnose SHs because most have a small orifice and the classic symptoms are absent. The clinical presentation varies, depending on the contents of the hernial sac and the degree of herniation [7], but the risk of strangulation is much higher for these types of hernia than for other types. Houlihan reported that the rate of incarceration was about 24% [8], and immediate operation after confirmed diagnosis should be considered.

The traditional surgical approach to repair these hernias has been via an open approach, although laparoscopic repair is often used and reported. Recent randomized trials and meta-analyses have confirmed that the laparoscopic repair of SH or IH can reduce postoperative pain and facilitate an earlier return to work compared to open repair [9]. IH and SH rarely occurred simultaneously, but TEP repair is technically feasible. Koksall reported the first TEP procedure used to treat both Spigelian and inguinal hernias [10]. Taking into account the future possibility of needing some kind of abdominal operation, we considered it feasible to choose TEP, with its low risk of forming adhesions, to cure both hernias.

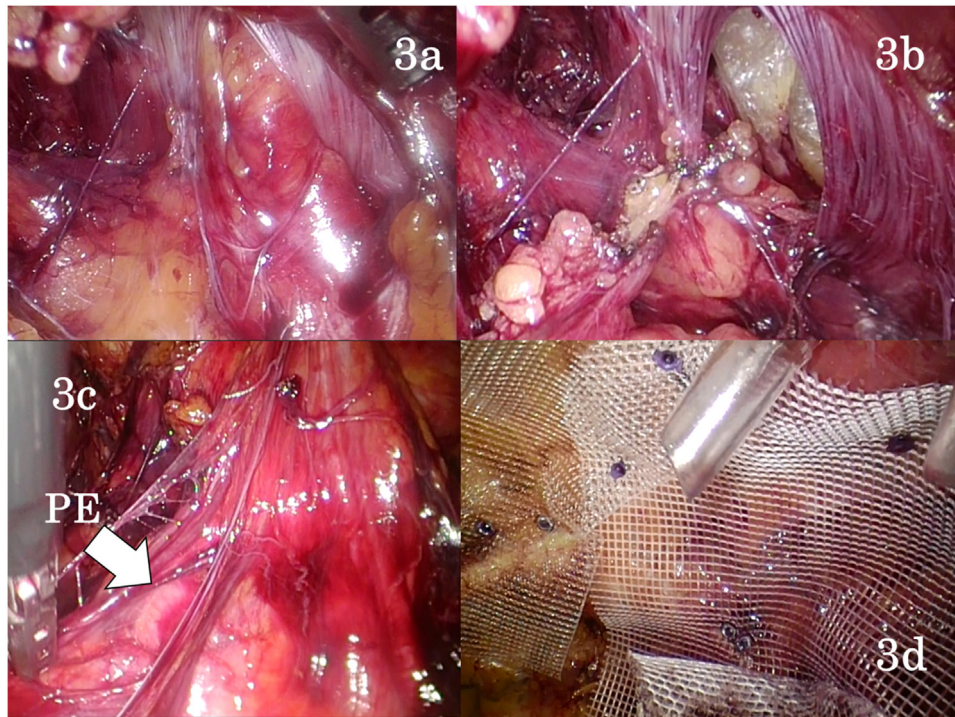


Fig. 3. Intraoperative photograph showing prolapsed right Spigelian hernia (3a), removed the hernia (3b), returned peritoneal edge (PE) of inguinal hernia (3c), and fixed polypropylene meshes (3d).



Fig. 4. The second laparoscopic exploration photographs showing right scarred and stiffened orifice (4a) by repeated prolapse, left intact peritoneum (4b), and the final laparoscopic exploration photograph showing elimination of the sac by ligation.

Unusually, our case had bilateral SHs. Spangen reported that bilateral cases made up about 3% of all cases [11], although because asymptomatic SHs such as our case were not included in that study it is probable that such cases occur a little more frequently. In our hospital, patients suspected of ventral hernia undergo CT examination in the abdominal position, focusing on the stomach. Nevertheless, in our case, the left SH was not detected until laparoscopic exploration. Moreover, the right orifice of the SH had become scarred because of long-term repeated prolapse, and there was a risk that the orifice would cause the reduction en masse of the SH. Because of this, we suggest that it is important to explore the intraperitoneal region by laparoscopy for SH surgery. In this case, we could not assess the risk of reduction en masse by scarring orifice



Fig. 5. Computed tomography showing repairing the hernia and no recurrence.

at the first laparoscopy, though we should have decided the decision to ligate the sac at first glance through the first laparoscopy.

4. Conclusions

We experienced an unusual coincidence of homonymous IH and SH, and bilateral SHs. The presentation of a lateral lower abdominal wall mass should raise the possibility of SH. The preoperative workup should include abdominal CT in the abdominal position focusing on the stomach to aid diagnosis and determine the appropriate surgical approach. The use of laparoscopy simplifies the diagnosis and facilitates the subsequent repair of the hernia. We believe that the simultaneous laparoscopic repair of SH and IH via the TEP approach is the ideal treatment.

Conflicts of interests

The authors have no conflict of interest to declare.

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Ethical approval

All procedures used in this study were approved by the Ethical Committee of International University of Health and Welfare Mita Hospital.

Authors' contributions

SM fully participated in the clinical treatment and follow-up of the patient and drafted the manuscript. NN and AK performed the operation. YI and YK helped to draft the manuscript. MK gave the final approval of the version to be published. All authors read and approved the final manuscript.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Guarantor

Shimpei Matsui is the guarantor of this paper.

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Not applicable.

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