

Giant spigelian hernia in a middle-aged female: The importance of intraoperative ultrasonography for hernia localization— Case report

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Abstract

Spigelian hernia is a rare type of abdominal wall hernia that accounts for only 0.12% of all abdominal hernias. A Spigelian hernia, also known as a spontaneous lateral ventral hernia or a hernia of the semilunar line, occurs when a part of the abdominal contents protrudes through the Spigelian fascia. Due to its anatomical location, Spigelian hernia can be difficult to diagnose through physical examination alone. Here we report a case of a 40-year-old female who experienced right abdominal pain and swelling, where ultrasonography imaging was crucial in the intraoperative diagnosis of Spigelian hernia. The patient underwent laparotomy mesh repair to address the condition. The lack of consistent physical findings and the rarity of the disease require a high level of clinical suspicion in the diagnosis of a Spigelian hernia. Its associated abdominal complaints are often vague and nonspecific, making it even more challenging. This case emphasizes the importance of utilizing imaging techniques to aid in the diagnosis of a Spigelian hernia and prompt surgical intervention to prevent complications associated with the hernia.

Keywords

Spigelian hernia, mesh repair, abdominal wall hernia, ventral swelling

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Introduction

Spigelian hernia (SH) is a rare but potentially serious type of abdominal hernia that occurs through a defect in the Spigelian aponeurosis, which is the aponeurosis of the transversus abdominis bounded laterally by the linea semilunaris and medially by the rectus abdominis. It was first described by Joseph Klinkosh in 1764 and is named after Adrian Van der Spieghel who first described the semilunar line.¹ While SH represents only 1%–2% of all ventral hernias, the true incidence remains unknown, as many patients remain asymptomatic.^{2,3} However, SH carries a significant risk of incarceration-related complications (24%), which require immediate surgery, making early diagnosis crucial.¹ Adult females have a higher incidence of SH, with a female-to-male ratio of 2:1.² In particular, females who have undergone previous pregnancies or have any condition leading to increased intraabdominal pressure are at greater risk.^{2,4,5} In

this report, we present a case of a female patient with SH and discuss its elusive diagnosis and management.

Case presentation

A 40-year-old female patient presented to the outpatient department with a complaint of intermittent right lower

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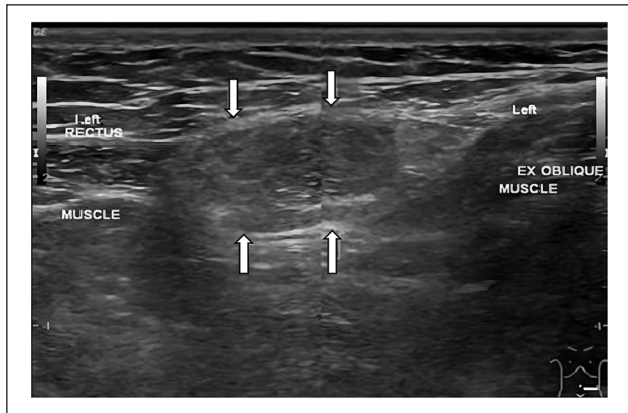


Figure 1. Ultrasonography of the abdomen shows a heterogeneously hyperechoic lesion (white arrow).

abdominal pain for 1 year, associated with constipation. She had a medical history of multiple pregnancies and a cesarean section 25 years ago, with no other significant medical or surgical history. The patient reported that the pain was sporadic and worsened with food but was relieved with medication. During clinical examination, an oval swelling measuring 6 cm × 5 cm was observed in the right lumbar region. The swelling had a smooth surface, a firm consistency, and was partially reducible. A positive cough pulse was observed. No other palpable swelling was found during the routine systemic examination, but the patient showed mild tenderness on palpation of the right flank region. An abdominal ultrasonography (USG) (Figure 1) revealed a heterogeneously hyperechoic lesion measuring 55 mm × 44 mm × 11 mm with an internal linear strand noted in the lower right infra umbilical abdominal wall. The hernia was located between the lateral margins of the right rectus abdominis and the medial border of the right internal oblique muscle, extending superficially to the right external oblique muscle. The neck of the lesion measured 11 × 10 mm, and the hernia was partially reducible on compression. Due to limited resources, a computed tomography (CT) scan was not feasible.

Intra-operatively, an atypical ventral hernia with omentum was found on opening the external oblique muscle aponeurosis (Figure 2(a) and (b)). The hernial sac was isolated from the pre-peritoneal fat and located between the semilunar line and the edge of the rectus abdominis muscles in the right upper abdominal wall, confirming it as an SH. Under spinal and epidural anesthesia, a hernioplasty procedure was conducted for 3 h. A linear incision was made in the bulging area, and the hernial sac was separated at its neck. The dissected margin measured 4 cm superiorly up to the seventh rib, 5 cm inferiorly, and 6 cm on each side from the hernia neck. Sac content identified as omentum (abdominal tissue) was repositioned, allowing successful reduction of the hernia.

The sac was brought back to the abdominal cavity and approximated, followed by the application of a pre-peritoneal nonabsorbable polypropylene mesh to treat the defect

(Figure 2(c)). Finally, a *Romo Vac Set*® (GS-5002) suction drain was fixed (Figure 2(d)). Hemorrhage was controlled, and upon stable condition assessment, the patient was transferred to the ward. Post-surgery, the patient recovered without any complications, experiencing no pain and with regular bowel movements, leading to discharge after 10 days. During follow-up, the patient was advised to lose weight, wear an abdominal belt, and avoid lifting heavy objects all of which they diligently followed.

Discussion

Etiology

SH is a medical condition that may originate from congenital dysgenesis of the mesenchymal layers in neonates. However, it is more frequently acquired in adulthood.² The development of SH is not unique to specific risk factors and can be caused by any condition that elevates intra-abdominal pressure, such as constipation, pregnancy, and chronic coughing.¹ In addition to these factors, previous surgeries or weakened abdominal walls also increase the likelihood of developing SH.

Pathophysiology

Around 90% of SH occurs in the Spigelian belt of Spangen, which is a 6 cm transverse strip distal to the umbilicus and above the line joining the anterior superior iliac spines.⁶ It occurs in this location owing to the deficiency of the posterior rectus sheath below the linea semicircularis.^{1,7} Moreover, the hernia sac along with some preperitoneal fat, slips through a small orifice into a loose space between the external and internal oblique muscles, producing a mushroom-shaped appearance.⁷ This small orifice is a chief factor for the 25% increased risk of hernia incarceration.

Diagnosis

Diagnosis of SH can be challenging, as it often presents with vague symptoms and lacks a visible or palpable mass. Patients typically present with intermittent pain and a swelling sensation in the lower abdomen. In cases of doubtful diagnosis, imaging techniques such as abdominal wall USG or CT scans are commonly performed.⁸ CT scan is preferred due to its specificity and ability to provide detailed information about the size, location, and content of the hernia sac.⁷ Clinical suspicion may be strengthened by the presence of persistent abdominal pain and tenderness at the Spigelian point. However, an accurate diagnosis is unattainable without imaging. Ultrasonography (US) serves as a valuable first-line method, particularly in emergencies. Nevertheless, the gold standard for diagnosis remains the CT scan, even though it carries a potential false-negative rate of up to 32%.^{9,10} However, if a palpable mass and cough impulse

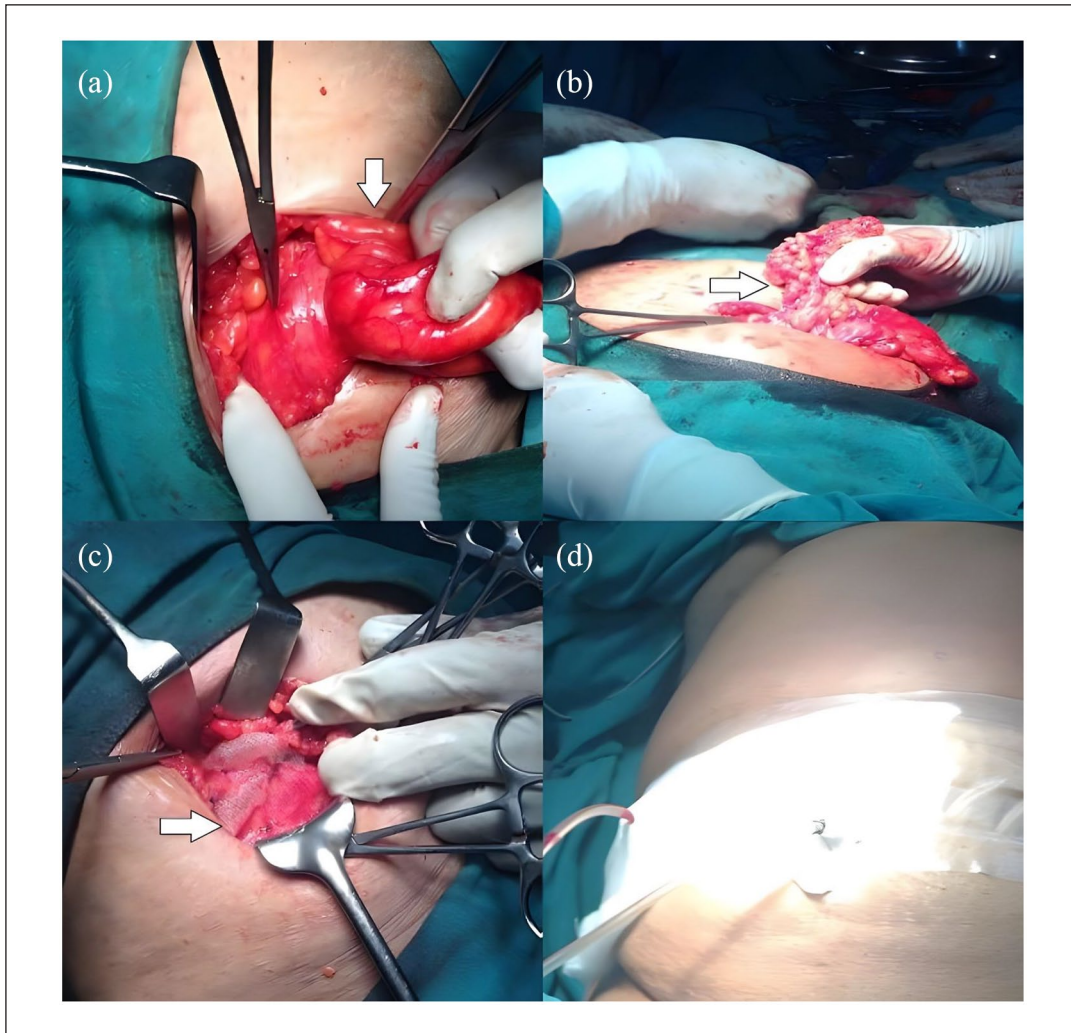


Figure 2. Intraoperative images: (a) and (b) Spigelian hernia with omentum (b—white arrow). (c) Repair of defect with preperitoneal mesh (white arrow). (d) Closure of incision site with suction drain.

exist within the Spigelian aponeurosis boundaries, a clinical diagnosis can be made without the use of imaging.² Nonetheless, only 50% of SH cases are diagnosed preoperatively,^{11,12} with the remaining 50% requiring surgical exploration.¹

Differential diagnosis

Although a palpable anterior abdominal mass near the Spigelian aponeurosis may indicate SH, it could also be a symptom of several other conditions, such as direct inguinal hernia, appendicitis, anterior abdominal wall tumor, and incisional hernia.⁸ To obtain an accurate diagnosis, eliminating these other potential causes through CT imaging and a thorough physical examination is crucial. It is important to note that the site of the palpable mass may not necessarily correspond to that of the actual hernial orifice.¹³

Treatment and outcomes

Surgery is the most effective treatment for SH and is highly recommended. There are two main surgical approaches: laparotomy and laparoscopy. The choice of surgical technique largely depends on the surgeon's experience and also takes into consideration the patient's fitness and the clinical stage of the hernia.² The clinical stages of SH are as follows:

Stage I : Patients in this stage are typically young and present without a palpable mass. The hernial content consists of interstitial fat without a peritoneal element. Open surgery is the preferred approach, as the hernia will not be visible laparoscopically.²

Stage II : This stage can be found in any age group and may present with a peritoneal component, a lump, and a moderate-sized defect (up to 5 cm). Both open and

laparoscopic approaches can be used, depending on the surgeon's experience and patient fitness.²

Stage III: Patients in this stage are typically older and present with a sizable lump that is easily palpable, and a defect larger than 5 cm. These hernias are too large for laparoscopic repair and require an open surgical approach.²

Various surgical techniques have been proposed for the treatment of SH. These techniques include tissue repair,¹ flat mesh placement between external and internal oblique,¹⁴ preshaped polypropylene umbrella plug,¹⁵ Prolene Hernia System (consisting of an underlay patch positioned in the preperitoneal space, a connector in the parietal defect, and an onlay patch placed above the internal oblique muscle),¹⁶ total extraperitoneal laparoscopic mesh repair,¹⁷ laparoscopic transabdominal suture repair,¹⁸ flat mesh in the preperitoneal space, and laparoscopic intraperitoneal onlay mesh repair.¹⁹ Recent studies have indicated that mesh repair may provide better results than suture repair.^{20–22} However, there is no consensus on the optimal surgical technique for SH. Therefore, a thorough evaluation of the various techniques is necessary to determine the most effective treatment strategy for SH.

Conclusions

SH, a rare type of hernia, is frequently small in size and poses a high risk of complications due to difficulties with preoperative diagnosis. Delayed diagnosis is a common occurrence, as SH lacks specific and consistent physical findings. The utilization of preoperative CT scans is crucial for guiding surgeons toward a minimally invasive approach, despite the fact that, in the majority of instances, urgent laparotomic surgery becomes necessary due to abdominal distension. Surgical repair is considered as a definitive treatment, involving primary or mesh repair of the defect as appropriate. SH presents a diagnostic challenge due to its unique anatomical localization and atypical clinical presentation, as highlighted in this case report. Given the high risk of acute complications associated with SH, despite its rarity, it should be included in the differential diagnosis of abdominal hernias.

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Author contributions

S.S.K., F.A.S., and H.S. were involved in the study concept, the collection of the data, drafting, literature review, data validation, supervision, and editing of the manuscript. H.M., M.S., and A.N. were responsible for the literature review and revising the manuscript for important intellectual content.

Data availability statement

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Our institution does not require ethical approval for reporting individual cases or case series.

Clinical trial registration

Not applicable.

Informed consent

Written informed consent was obtained from the patient(s) for their anonymized information to be published in this article.

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