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Case report: strangulated spigelian hernia as an uncommon cause of intestinal obstruction

Reporte de caso: hernia de Spiegel estrangulada como causa infrecuente de obstrucción intestinal

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ABSTRACT

Spigelian hernias (SH) are very rare, representing approximately 0.5% to 2% of ventral wall hernia defects. Due to their low incidence, they pose a diagnostic and surgical challenge in General Surgery. This case report describes a rare strangulated Spigelian hernia causing intestinal obstruction in a 72-year-old female with a history of laparoscopic cholecystectomy. The patient presented with periumbilical pain, nausea, vomiting, and no bowel movements for 48 hours. Initial imaging suggested partial obstruction, but a CT scan confirmed herniation of ileal loops through the Spigelian aponeurosis. Surgical intervention included ileum resection, hernioplasty with mesh, and VAC drain placement. The complexity of diagnosing Spigelian hernias arises from their location, resembling umbilical or incisional hernias, and risk factors like obesity. This case emphasizes the need for accurate imaging and prompt surgery to prevent complications.

Keywords: Hernia, Spigelian hernia, Strangulated hernia, Intestinal Obstruction.

RESUMEN

Las hernias de Spiegel (SH) son muy raras y representan aproximadamente del 0,5% al 2% de los defectos de las hernias de la pared ventral. Por su baja incidencia suponen un reto diagnóstico y quirúrgico en Cirugía General. Este informe de caso describe una rara hernia de Spiegel estrangulada que causa obstrucción intestinal en una mujer de 72 años con antecedentes de colecistectomía laparoscópica. El paciente presentó dolor periumbilical, náuseas, vómitos y ausencia de deposiciones durante 48 horas. Las imágenes iniciales sugirieron una obstrucción parcial, pero una tomografía computarizada confirmó la herniación de las asas ileales a través de la aponeurosis de Spiegel. La intervención quirúrgica incluyó resección de íleon, hernioplastia con malla y colocación de drenaje VAC. La complejidad del diagnóstico de las hernias de Spiegel surge de su ubicación, parecida a las hernias umbilicales o incisionales, y de factores de riesgo como la obesidad. Este caso enfatiza la necesidad de obtener imágenes precisas y una cirugía inmediata para prevenir complicaciones.

Palabras clave: Hernia, Hernia de Spiegel, Hernia estrangulada, Obstrucción intestinal.

INTRODUCTION

First described in 1645 by the anatomist Adriaan Van den Spiegel, Spigelian hernias (SH), which bear his name, are a defect in the fascia or aponeurosis of Spiegel. They are located between the medial edge of the rectus abdominis muscle and the semilunar line on the lateral edge. Through these defects, abdominal organs, parietal peritoneum, and subcutaneous tissue may protrude (Beroukhim et al., 2022).

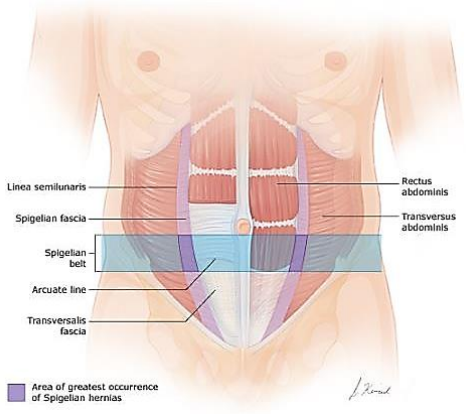
Although these hernias are rare—they make up just 0.5% to 2% of all abdominal wall hernias—they have a high risk of consequences, including blockage and strangling (Ba-shammakh et al., 2024). Few cases are reported in the literature. In the case studied by Igwe and Ibrahim (2016), a 56-year-old lady with three days' worth of stomach discomfort and oedema was sent to the surgical emergency unit (Igwe & Ibrahim, 2018). Examining her revealed an empty rectum, hyperactive bowel sounds, and a painful lump in the left iliac fossa, suggesting acute bowel blockage, even though she had no history of abdominal surgery or recurring discomfort. The results of a CT scan showed a mesentery and small bowel-containing strangulated Spigelian hernia. A 5 x 4 cm gap in the Spigelian fascia was discovered during emergency surgery. The sac was formed by gangrenous ileal segments and a portion of the herniated bladder. The defect was repaired with non-absorbable sutures to approximate the internal oblique and transversus abdominis to the rectus sheath, strengthened with nylon darning, after the gangrenous bowel resection and end-to-end anastomosis.

A 76-year-old lady in Central Uganda arrived with a 2-day history of colicky stomach pain, bilious vomiting, and abdominal distension in a case identical to the one described by Wasingya et al. (Lucien et al., 2019). A significant Spigelian hernia with ruptured intestinal loops and fluid accumulation in the hernia sac was discovered using ultrasound imaging. On the second day, the patient had surgery after being treated conservatively at first with nil per os (NPO), nasogastric tube decompression, and enemas. A significant Spigelian aponeurosis defect with an inflammatory sac was found and mesh was used to fix it. After a 10-day stay, the patient totally healed and was released from the hospital.

A 77-year-old woman with an imprisoned Spigelian hernia presented with a high-grade small intestinal blockage, as reported by Lavin et al.(Lavin et al., 2020) The patient arrived with vomiting and stomach discomfort and had no prior surgical history. The doctors discovered strangulated small intestinal mesentery inside the hernia sac after performing a laparotomy. The defect was mostly corrected, and the hernia was diminished. Since Spigelian hernias may not manifest with visible abdominal masses, imaging methods like computed tomography (CT) are crucial for a precise diagnosis. This case illustrates the diagnostic challenges frequently associated with Spigelian hernias. Early surgical intervention in this case avoided more problems.

Cesaro et al, documented the case of a 64-year-old male individual exhibiting symptoms of small intestine obstruction resulting from an imprisoned Spigelian hernia (Cesaro et al., 2021). The patient had CT and ultrasound scans, which showed a closed-loop blockage with the hernia looking like a "bulb-like" structure. This distinctive discovery aided preoperative diagnostic confirmation was aided by this distinctive discovery. The incarcerated hernia was minimized and the defect was corrected during the surgical procedure. The patient recovered well postoperatively, and this case demonstrated the importance of imaging in diagnosing Spigelian hernias, particularly in cases where clinical signs are subtle or non-specific.

Figure 1. Location of the Spigelian hernia belt



Location of the Spigelian hernia belt, which extends from just below the navel to the interspinal line. The areas at the intersection of the Spigelian fascia and the Spigelian belt are where most Spigelian hernias occur. Source: Webber V, Low C, Skipworth RJE, et al. Contemporary reflections on the treatment of Spigelian hernia. Hernia 2017; 21:355.

In this type of ventral wall defects, the frequency in men versus women is unknown, but it is more commonly seen in patients between the fifth and sixth decades of life. The diagnostic threshold increases with key risk factors such as increased intra-abdominal pressure due to overweight, obesity, multiparity, and the weakening of the Spigelian aponeurosis, which may be associated with collagenopathies or chronic obstructive pulmonary disease (COPD) (Lamichhane et al., 2024).

In general, the diagnosis of Spigelian hernias is not straightforward, as most defects in patients are asymptomatic. When clinical symptoms are present, they usually manifest only as swelling or a mass lateral to the rectus muscle on the affected side. Therefore, complementary imaging tests are very helpful in managing these patients. Ultrasonography (US),

computed tomography (CT), and magnetic resonance imaging (MRI) are highly valuable in this context (Shrestha et al., 2023).

Ultrasonography (US) is more commonly used due to its cost-effectiveness, but it is important to remember that this test heavily depends on the experience and learning curve of the professional. Therefore, the preferred study is abdominal CT.

The definitive treatment for Spigelian hernias is surgical, but it has specific indications. In contrast, medical treatment is only for stable patients and is a bridge to definitive treatment. However, an important recommendation is that the treatment will always be surgical repair (Thamri et al., 2021).

ETHICAL ASPECT

Informed consent was obtained from the patient after a detailed explanation of the purpose of the case report, ensuring the patient's understanding and voluntary agreement to participate. The case and all related details were reviewed and approved by the ethical committee of Enrique Garcés General Hospital, which confirmed that the publication aligns with ethical guidelines and standards. The patient's privacy and confidentiality were maintained throughout the study, with all identifying information anonymized in the report. All ethical aspects involved in research with human beings, according to the recommendations of the World Health Organization, are followed.

CASE PRESENTATION

Female patient, 72 years old, residing in Quito, Ecuador, with a personal medical history of hypothyroidism, treated with 50 mcg of Levothyroxine orally every day, and a surgical history of total hip replacement eight years ago due to osteoarthritis of the hip joint, as well as a laparoscopic cholecystectomy (COLELAP) without complications ten days ago for acute cholecystitis.

She was admitted to the emergency department of Enrique Garcés General Hospital presenting the following clinical picture: periumbilical abdominal pain for approximately 48 hours, without radiation, accompanied by nausea, fecaloid vomiting, absence of flatus, and she reports not having had a bowel movement in the last three days.

Vital signs upon admission: Blood pressure: 100/60 mmHg, heart rate: 100 beats per minute, respiratory rate: 27 breaths per minute, temperature: 36.5 °C. Upon general physical examination: dehydrated sclerae and conjunctivae, decreased skin turgor.

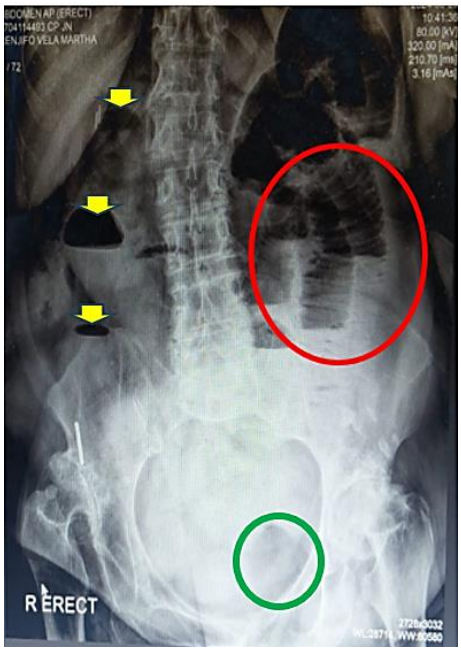
On inspection of the abdominal physical examination, clean surgical wounds are observed without evidence of infection from the previous COLELAP, a globular abdomen due to adipose tissue, distended and painful to both superficial and deep palpation in the mesogastric, hypogastric, and right iliac fossa regions.

Appendicular signs are negative (McBurney, Blumberg, and psoas), and stool is found in the rectal ampulla during exploration.

Laboratory studies upon admission report electrolytes: sodium 143 mmol/L (reference value 137-147), mild hypokalemia 3.37 mmol/L (reference value 3.5-5.3), chloride 101 mmol/L (reference value 99-110), pancreatic enzymes: amylase 59 (reference value 40-140 U/L), elevated lipase 34 U/L (reference value 0-60). Complete blood count reports leukocytosis 10.06 10/uL (reference value 4.09-9.75), neutrophilia 79.7 (reference value 41.2-73.5), lymphopenia 0.96 (reference value 1.92-6.44), monocytosis 0.80 10/uL (reference value 0.19-0.68), hemoglobin 13.5 g/dl (reference value 11.3-15.4), hematocrit 40.4 (reference value 34.7-46.6), platelets 301 10/uL (reference value 131-357), inflammatory response with elevated CRP of 32.47 mg/dl (reference value 0-0.4). Liver profile reports: total bilirubin 0.97 mg/dl (reference value 0.3-1.1), direct bilirubin 0.55 mg/dl (reference value 0.1-0.4), indirect bilirubin 0.43 mg/dl (reference value 0-0.9), liver enzymes: AST 28 U/L (reference value 0-31), elevated ALT 49 mg/dl (reference value 0-34), elevated alkaline phosphatase 147 U/L (reference value 30-120), elevated GGT 107 U/L (reference value 11-61).

She was admitted to the hospital under the general surgery specialty with a suspected postoperative acute abdomen, and initial management was started with intravenous fluid replacement, antiemetics, metoclopramide 10 mg intravenously every 8 hours, placement of a nasogastric tube (with 1500 ml of bile-stained content), Fleet enema, antibiotic therapy with ampicillin plus sulbactam (1 g/0.5 g) every 6 hours. An initial intestinal transit fluoroscopy was performed, which showed absence of gas in the rectal ampulla, a "coin pattern," and multiple hydro-aerial levels. In this context, a diagnosis of partial obstructive abdomen was made, and a nasogastric tube was placed with the presence of stool following the enema.

Figure 2. Intestinal transit fluoroscopy

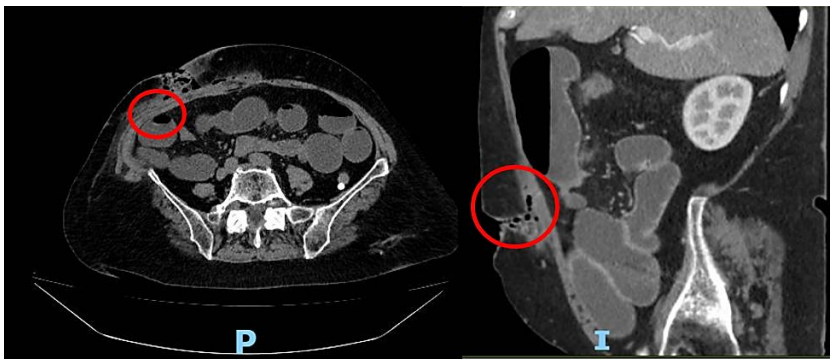


Intestinal transit fluoroscopy, showing the absence of gas in the rectal ampulla. Additionally, in the red circle, the 'stack of coins' pattern is observed. Similarly, in the area marked with a green circle, the absence of gas in the rectal ampulla is noted, and in the area marked with yellow arrows, hydro-aerial levels at different heights are indicated. All these radiological signs are suggestive of intestinal obstruction. Source: the authors.

After 24 hours with slight improvement of obstructive symptoms but without passing flatus or having a bowel movement, the decision was made in the General Surgery department to remove the nasogastric tube, with strict monitoring of fluid intake and output balance. A poor response was observed, with worsening of the general condition and no response regarding bowel movements.

Consequently, a more complex imaging study was performed, a CT scan of the abdomen and pelvis, to rule out mechanical obstruction processes, which showed: herniation of intestinal loops from the proximal and mid ileum through the Spigelian aponeurosis in the right flank, as well as signs of intestinal distress, such as intestinal dilation and absence of enhancement in the walls.

Figure 3. CT scan in coronal and sagittal planes



CT scan in coronal and sagittal planes, showing herniation of intestinal loops from the proximal and mid ileum in the ventral abdominal wall, through the Spigelian aponeurosis in the right flank, as indicated in the red circle. Source: the authors.

The patient is transferred to the operating room for surgical resolution, undergoing the following procedures: mini-laparotomy, resection of the ileum with end-to-end anastomosis, excision of the hernia sac, hernioplasty, placement of mesh, and placement of a VAC drain.

The postoperative patient shows good progression, with strict monitoring and control of vital signs for 48 hours. Without any complications, the patient is discharged for follow-up in outpatient care.

DISCUSSION

The diagnosis of a Spigelian hernia can be complex for several reasons, one of which is its anatomical location, as it occurs along the semilunar line, which is a lateral area of the abdomen, around the edge of the rectus abdominis muscle. Unlike common hernias such as inguinal or umbilical hernias, this type of hernia is covered by several layers of muscle and aponeurosis, making it less visible or palpable externally (Hanzalova et al., 2022).

Another reason is the lack of visible protrusion, as these hernias are often interstitial, meaning they remain within the muscular layers without penetrating the skin. They do not always present an obvious mass protruding as is common with other hernias, making them undetectable during a routine abdominal physical examination (Steinberger & Holden, 2023).

The signs and symptoms of a Spigelian hernia can be diffuse, such as mild to moderate abdominal pain that may be confused with other gastrointestinal conditions like appendicitis or colitis. Often, the pain is not clearly localized. Another reason is that due to its deep location, this type of hernia requires advanced studies such as ultrasound or a CT scan, as was the case with the patient for whom a CT scan of the abdomen and pelvis was requested to confirm the presence of the hernia.

It is important to mention the risk factors that led to the patient developing a Spigelian hernia, such as increased intra-abdominal pressure due to obesity, chronic constipation, repeated heavy lifting, and previous surgeries, especially those involving incisions near the semilunar line, which can lead to weakness of the abdominal wall, particularly since the patient underwent a cholecystectomy.

The most common complications associated with a Spigelian hernia are incarcerated and strangulated hernias, both of which can lead to critical clinical scenarios such as intestinal obstruction (Ba-shammakh et al., 2024).

An incarcerated hernia occurs when a part of the intestine or abdominal tissue gets trapped in the hernia and cannot return to the abdominal cavity. The trapped content can cause intestinal obstruction and, if untreated, may progress to strangulation. One characteristic symptom is constant abdominal pain in the area of the hernia, along with nausea, vomiting, and constipation or inability to have a bowel movement.

A strangulated hernia occurs when the incarcerated content of the hernia, typically a segment of the intestine, compromises blood flow, which can lead to ischemia, necrosis, and consequently complete intestinal obstruction. If this type of hernia is not treated immediately, it can result in peritonitis and sepsis.

When a strangulated hernia with intestinal obstruction is suspected, the clinical picture is intense, sudden, and continuous pain that does not subside with analgesics, along with persistent vomiting of bilious or fecal content, marked abdominal distension, and absence of bowel sounds, indicating a lack of intestinal transit and no bowel movements. Spigelian hernias can be challenging to detect clinically, as they are often contained within the deep musculature.

The physical examination can be enhanced with the patient standing and using the Valsalva maneuver, but up to 50% of these hernias go undetected with just a clinical examination, especially in obese patients; many are diagnosed only when they cause pain or complications such as incarceration or strangulation. Approximately 27% of diagnosed Spigelian hernias suffer incarceration, increasing the risk of severe complications.

For diagnosing a Spigelian hernia, both computed tomography (CT) and ultrasound are useful, but CT is generally more specific for detecting this type of hernia, as it provides detailed images of soft tissues, muscles, and internal organs in cross-sections, allowing for the identification of the exact location of the hernia, herniated content, and any complications of incarceration or strangulation (De et al., 2023).

CT is also very useful for detecting intestinal obstruction, ischemia, or strangulation. Ultrasound, on the other hand, is less expensive and more accessible than CT, and does not involve exposure to radiation. However, it is operator-dependent, meaning its accuracy relies on the skill and experience of the technician. This diagnostic method is useful for the initial detection of a Spigelian hernia, especially if it is superficial or large, but its effectiveness is limited for visualizing deeper hernias or those with complications compared to CT. Additionally, ultrasound is limited in obese patients or those with marked abdominal distension because it impairs adequate visualization.

Therefore, if a complicated Spigelian hernia is suspected or cannot be confirmed with ultrasound, CT is the test of choice for a definitive diagnosis. Spigelian hernias are rare lateral abdominal wall hernias that emerge from the Spigelian fascia, which can complicate their clinical diagnosis, as they are covered by the external oblique aponeurosis. Patients may present with a palpable lump, but in some cases, they may only have pain or a vague bulge. Ultrasound and CT are commonly used for diagnosis. Ultrasound is non-invasive but limited in obese patients. CT is useful, although it involves radiation exposure. In ambiguous cases, diagnostic laparoscopy may be considered.

CONCLUSION

The clinical diagnosis of a Spigelian hernia is challenging due to its deep anatomical location and lack of visible protrusion, which is further complicated in patients with a history of previous abdominal surgery, such as laparoscopic cholecystectomy. In these patients, the physical examination may be limited by surgical scars and adhesions, making hernia identification difficult. In such cases, a high clinical suspicion is necessary, especially with the presence of sudden abdominal pain localized near the semilunar line, particularly in those with prior surgery, as the procedure can weaken the abdominal layers and predispose to hernia formation. Additionally, persistent vomiting of bilious or fecal content and constipation may be present.

Due to the complexity of clinical diagnosis in these types of defects, early use of imaging studies is recommended, particularly in those with surgical history. CT is the ideal imaging method for detailed evaluation of the abdominal wall, allowing for the identification of deep hernias and detection of complications such as incarceration or strangulation. If CT is not available, ultrasound can be useful, but its precision is diminished.

In patients with persistent clinical symptoms and a history of prior surgery, imaging studies may not always provide a clear diagnosis, and an exploratory surgical evaluation could be considered. Diagnostic laparoscopy not only allows for direct visualization of the hernia defect but also enables hernia repair, especially if there is suspicion of complications or signs of intestinal obstruction. If a Spigelian hernia is confirmed, surgical treatment is necessary to avoid complications such as incarceration or strangulation. Repair may be performed with the placement of a surgical mesh to reinforce the weakened área.

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