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Laparoscopic diagnosis and repair of Spigelian hernia: A case report and literature review

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ABSTRACT

INTRODUCTION: Spigelian hernias are a rare type of hernia which protrude through the abdominal wall at the semilunar line. They are especially difficult to diagnose due to their location and non-specific symptoms and are often overlooked because of their positioning between muscular layers. Patients may present with localized pain which can aid the diagnosis. CT and ultrasound are also helpful.

Presentation of case: We present the case of a 75-year-old female patient who presented to Hialeah Hospital with a one-year history of abdominal pain localized to the left lower quadrant.

DISCUSSION: A Spigelian hernia containing omentum, was found during a diagnostic laparoscopy. The hernia was reduced, and the abdominal defect was repaired via primary repair, reinforced by mesh. The patient recovered uneventfully.

CONCLUSION: Nonspecific physical exam findings and inconclusive imaging studies represented a diagnostic challenge. Here we discuss a case of a Spigelian hernia discovered through diagnostic laparoscopy.

1. Introduction

A Spigelian hernia is defined as a protrusion of preperitoneal fat, omentum, or an organ, through the transversus abdominis muscle. There is a weakness in the Spigelian fascia that gives rise to a Spigelian hernia, and this may be either congenital or acquired [1]. Spigelian hernias were named after the Flemish anatomist, Adrian van den Spiegel, who was the first to describe the semilunar line. However, it was Josef Klinkosch who was credited for recognizing a clinical entity associated with the Spigelian area in 1764 [2]. Spigelian hernias are rare, representing only 1–2% of abdominal wall hernias, with a slightly higher incidence in women. The diagnosis is most often made based on physical exam findings and imaging [1]. Here we discuss a case of a Spigelian hernia discovered through diagnostic laparoscopy, in the absence of pertinent physical exam or imaging findings. This work has been reported in line with the SCARE criteria [3].

2. Presentation of case

We present the case of a 75-year old, obese female who presented to our facility for evaluation of left lower quadrant abdominal pain that radiated to the lower back, daily, after a transvaginal bladder suspension surgery performed last year. The pain was described as an intense, intermittent pain, exacerbated by abdominal flexion and partially alleviated by evacuations and sometimes spontaneously. In review of systems the patient denied changes in bowel functions, hematuria or vaginal discharge. Patient's past medical history reveals hypertension, dyslipidemia, GERD, Diabetes mellitus, osteoporosis, arthritis, recurrent UTIs, and thyroid disease. Her surgical history revealed a prior lumbar laminectomy, appendectomy, abdominoplasty, hysterectomy and lysis of adhesions. Physical exam revealed left lower quadrant tenderness with no clinically palpable mass or hernia. She had been seen multiple times by multiple specialists for this pain without any success in reaching a proper diagnosis. Abdominal ultrasound was ordered but findings were inconclusive. The abdominal computerized tomography (CT) showed no evidence of acute abdominopelvic disease but reported findings consistent with constipation. Due to the persistence and severity of the patient's symptoms, and the lack of definitive evidence from CT and ultrasound, the decision was made to take the patient in for a diagnostic laparoscopy.

After adequate preparation, a 5 mm camera was inserted at the level of the umbilicus. Upon entry into the abdominal cavity no evidence of bleeding or injury to internal organs was noted, multiple adhesions were visible in the area of the left lower quadrant

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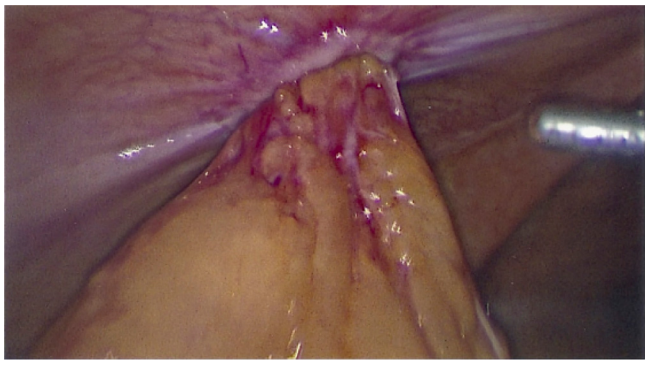

Fig. 1. First laparoscopic photograph taken after lysis of adhesions. Spigelian hernia visible with segment of trapped omentum.

and right lower quadrant, and were subsequently lysed using the Harmonic scalpel®. Upon removal of these adhesions, a Spigelian hernia was visible in the left lower quadrant, containing a segment of omentum (Fig. 1). There was no relationship between the previous laparotomy incision site and the location of the Spigelian hernia found.

Two additional 5 mm ports were placed, one at the left midclavicular line in the left upper quadrant and another at the right midclavicular line in the right upper quadrant. The segment of omentum trapped inside the Spigelian hernia was reduced and resected using a Harmonic scalpel®, which permitted visualization of the defect in the Spigelian fascia (Fig. 2a,b).

The defect was repaired by approximating the tissues using a suture passer (Fig. 3a) and then secondarily reinforced using a 4×6 inch Proceed™ mesh secured with sutures at the 3 and 9 o'clock position and then anchored to the abdominal wall using the Securestrap® fixation device (Fig. 3b). The mesh was noted to be taught and with excellent overlap of the defect. Abdomen was irrigated with saline followed by aspiration of the fluid. No bleeding or hematoma was visualized. The mesh was again inspected and noted to be in the proper position. The remaining internal organs were grossly unremarkable.

The patient tolerated the procedure well, without any complications and with minimal bleeding. Postoperatively, the patient made an uneventful recovery and was discharged on the first postoperative day.

3. Discussion

Spigelian hernias are ventral hernias that occur at the linea semilunaris; most often where it crosses Douglas' line "Spigelian hernias occur through the Spigelian fascia which is composed of the aponeurotic layer between the rectus muscles medially, and the semilunar line laterally." [1]. The Spigelian fascia is the space between the lateral border of the rectus abdominis and the semilunar line, also called the Spigelian line. The semilunar line is the most caudal extent of the posterior rectus sheath. Spigelian hernias are also referred to as hernias of the semilunar line, hernias through the conjoint tendon, or as spontaneous lateral ventral hernias. As previously mentioned, they are a rare form of hernia, representing less than 2% of all abdominal hernias [1]. Spigelian hernias may occur secondary to increased intraabdominal pressure due to obesity, pregnancy, chronic cough and prostate disease [4]. Additionally, a history of previous abdominal surgeries may predispose patients to the development of Spigelian hernias due to the resultant weakening of the semilunar line [5].

Spigelian hernias are generally small in diameter, typically measuring 1–2 cm. They tend to develop during the fourth to seventh decade of life, with a higher prevalence in females. It is believed that they develop as a result of weakness in the fascia created by perforating vessels. These hernias have a very narrow neck, increasing the risk of incarceration and strangulation [1,6]. Studies suggest that the risk of incarceration could be as high as 20% at the time of diagnosis. Therefore, the presence of a Spigelian hernia is an indication for its surgical repair. Once repaired, reoccurrence is uncommon [7,8].

Spigelian hernias can be repaired using an open conventional approach, or laparoscopic repair. Despite the increased popularity of the laparoscopic approach the open mesh repair is still the most common method employed [8]. Spigelian hernias typically become

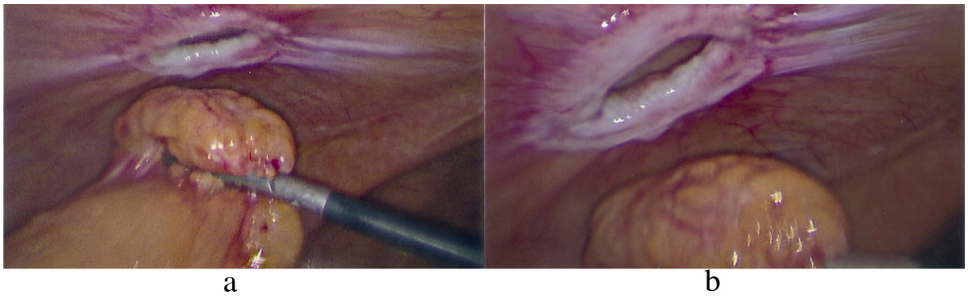

Fig. 2. Visualization of the defect in the Spigelian fascia after reduction of trapped omental segment (a). A closer view of the defect in the Spigelian fascia (b).

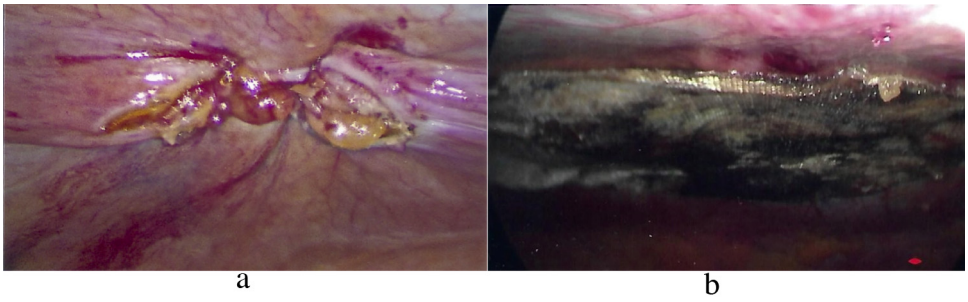

Fig. 3. (a) Laaparoscopic view after primary repair of the Spigelian defect and (b) Laparoscopic photograph after positioning and securing the mesh to the abdominal wall.

symptomatic only once they have become incarcerated [9]. "An open approach is more feasible in emergent presentations associated with viscus incarceration, as this prevents undue delays and allows for rapid reduction with possible revival of ischemic tissues, as well as reduction of the rate of iatrogenic bowel injury during trocars insertion for the laparoscopic approach" [10]. Although direct approximation may be performed, studies have shown a distinct advantage in recurrence rates with the usage of prosthetic mesh [8]. A prospective randomized trial comparing outcomes in patients who underwent open repair vs. those who underwent laparoscopic repair showed an advantage regarding morbidity ($P < 0.05$) and hospital stay ($P < 0.001$), for those who underwent laparoscopic repair. The study took 11 patients who underwent open repair and compared their outcomes with 11 patients who underwent laparoscopic repair. They reported an average hospital stay of five days for the open repair group vs. one day for the laparoscopic group. In the group that underwent open repair, four postoperative hematomas were detected. This study demonstrated a clear advantage to the laparoscopic approach in terms of hospital stay and morbidity [11].

When done laparoscopically, the *trans*-abdominal approach is preferred. A total extraperitoneal (TEP) approach has been described in multiple case reports. The advantage of TEP repair is that it significantly decreases the risk of complications related to penetrating the peritoneal layer, therefore decreasing adhesions and additional complications [12,13]. In our case, the TEP approach was not employed because the diagnosis was made only after inserting a laparoscope into the peritoneal cavity. Another consideration besides the surgical approach is the method used for fixation of the mesh. Traditionally, staples have been the primary means to secure the mesh. Huber and colleagues described a novel approach using a fibrin sealant in place of staples to secure the mesh. This is believed to reduce the risk of complications such as nerve entrapment, hematomas, and post-operative chronic pain [8].

Spigelian hernias present with localized pain at the hernia site which may or may not be palpable during the physical exam. During the physical exam, a tender spot is often palpable over the hernia defect when the abdominal muscles are tensed. Palpation of the hernia is facilitated by having the patients alternately tense and relax their abdominal muscle [5]. The diagnosis is unequivocal if the patient presents with a palpable mass and hernia defect along the Spigelian aponeurosis. However, palpable masses are often not well localized during physical exam, as the hernia may dissect through the layers of the abdominal wall and localize away from the semilunaris line [14]. This may lead to confusion during an open surgical approach since the incision is often made over the palpable mass, but the actual defect may exist away from the mass [15]. Additionally, patients often have localized pain in the area, but no bulge, because the hernia lies beneath the external oblique aponeurosis [1,16]. Although CT and ultrasound are often useful to make the diagnosis, Spigelian hernias are often not visible with either study [14]. When the mass is not palpable during physical exam and not visible through ultrasound or CT scan, diagnostic laparoscopy may be indicated.

4. Conclusion

We experienced an unusual case where the diagnosis of a Spigelian hernia was especially challenging due to vague symptomatology and the lack of a palpable defect; likely as a consequence of the patient's obesity. We encountered a patient with chronic left lower quadrant pain whose physical examination was only positive for pain on palpation and during abdominal flexion. Inconclusive imaging studies made diagnostic laparoscopy a logical choice. The laparoscopic approach was central to this case since it permitted both diagnosis and surgical repair.

Conflict of interest

There are no conflicts of interest or financial disclosures to report.

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Ethical approval

This is not a research study.

Consent

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

Author contributions

Raul Mederos: Attending surgeon, performed the procedure. Supervised every step of the case report production and data collection.

Jose R. Lamas: Attending surgeon, oversaw the entire process.

Javier Alvarado: Assisted in surgery, contributed to study design, data collection, and writing.

Moises Matos: Corresponding author, contributed to study design, data collection, and writing.

Ivett Padron: Contributed to study design, data collection, and writing.

Anika Ramos: First assistant during surgery, contributed in data collection.

Guarantor

Raul Mederos.

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