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# Laparoscopic pre-peritoneal mesh approach in Spigelian herniorrhaphy. A case report

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## Abstract

We present a unique case of a Spigelian hernia and its laparoscopic pre-peritoneal mesh herniorrhaphy. A Spigelian hernia is the only known interparietal hernia of the abdominal wall and its clinical diagnosis and management remain elusive. Various attempts at surgical repair have included open, laparoscopic and robotic techniques. The mesh placement has varied between an on lay, underlay, or pre-peritoneal fixation. Current hernia guidelines remain nebulous as to the correct technique and mesh placement. Our case remains unique because the peritoneum was quite emaciated and could not be used for a proper mesh reperitonealization. We, therefore, used the hernia sac to cover our non-absorbable nylon mesh. We believe this adds to the rarity of this case report. The patient's recovery was uneventful. She has no hernia recurrence at six months post-surgical herniorrhaphy. A surgical follow-up of at least five years is required to determine the feasibility of our technique.

## Keywords:

Laparoscopic herniorrhaphy, pre-peritoneal mesh, Spigelian hernia

## Introduction

The Spigelian aponeurosis lies lateral to the rectus abdominis muscle and medial to the semilunar line. It runs from the ninth costal cartilage to the pubic symphysis. Running transverse across this line inferior to the arcuate line is the Spigelian belt. This is the region of greatest abdominal circumference and a point of high intraabdominal pressure.<sup>[1]</sup> The well-defined gap at the Spigelian aponeurosis within the Spigelian belt is the site of 85%–95% of Spigelian hernias.<sup>[2]</sup> The neck of the hernial sac is situated between the Linea semi circularis and Linea semilunaris. The pathophysiology involves deficiencies in the posterior rectus sheath and conditions that increase intraabdominal pressure.<sup>[3]</sup> Spigelian hernias carry an incarceration risk in up to 24% of cases.<sup>[1]</sup> This is attributed to

the small hernial orifice between the rigid Spigelian aponeurosis and the interparietal positioning of the hernial sac. This case series has been reported in line with the SCARE criteria.

## Case Report

A 79-year-old female presented with a problem of a vague abdominal mass. A computerised tomography [CT] colonography diagnosed an incidental finding of a Spigelian hernia [Figure 1]. Her medical history included well-controlled diabetes and hypertension. Clinical examination revealed a vague swelling in the right iliac fossa on her abdominal wall. The assessment was difficult due to her thin abdominal wall musculature. Her body mass index [BMI] was 30.8. Her entire abdominal wall distended with increased abdominal pressure. She remained asymptomatic and was able to easily reduce the hernia.

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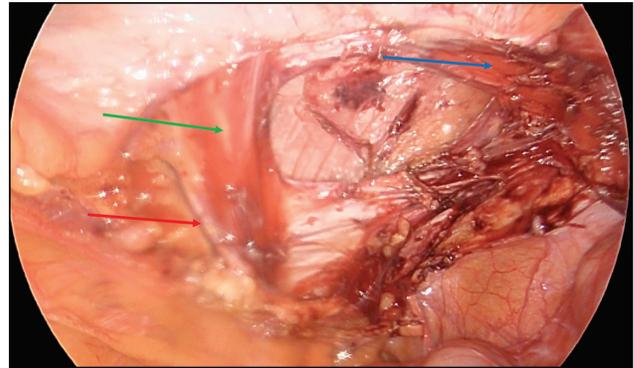
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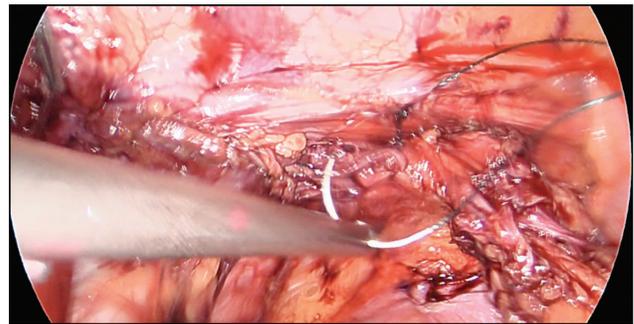
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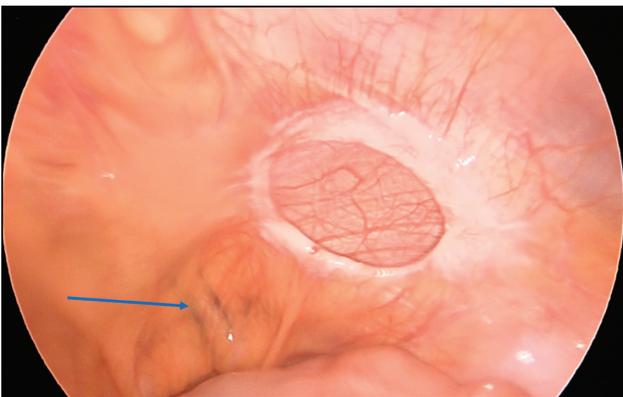
**Figure 1:** Computerised tomography scan showing a Spigelian hernia with small bowel herniation (yellow arrow) lateral to the right rectus muscle (green arrow)



**Figure 3:** Pre-peritoneal exposure of the hernia neck showing the right rectus muscle (green arrow) and transversalis muscle (blue arrow). The right inferior epigastric vessels are also exposed (red arrow)



**Figure 4:** Laparoscopic closure of the hernia neck with a V-Loc® suture



**Figure 2:** Laparoscopic view of the hernia neck after hernial content reduction. The right inferior epigastric vessels (blue arrow) lie medial to the hernia

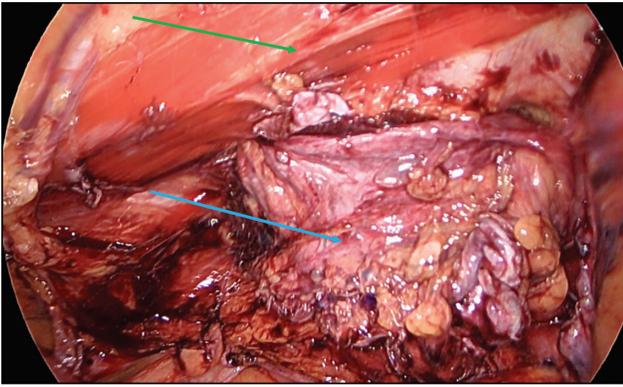


**Figure 5:** Application of the hernia mesh secured with absorbable tacks

After an extensive discussion, the patient decided to forgo a surgical herniorrhaphy. At her surgical follow-up three months later, she mentioned that the hernia had now increased in size. She had greater difficulty in reducing the hernia. An informed consent was taken for a laparoscopic pre-peritoneal repair with a mesh insertion. Intra-operatively the Spigelian hernia neck was identified [Figure 2]. Hernial contents had reduced on anesthesia induction. The peritoneum was opened to enter the pre-peritoneal space [Figure 3]. The hernial sac was reduced as a possible tissue cover for the mesh as the peritoneum appeared to be quite thin. The hernia neck was closed with 2-0 V-loc® barbed suture thereby reducing the surface area for mesh overlap [Figure 4]. The hernia neck was 2 cm in diameter. This

allowed us to use a smaller 6.4 cm diameter umbilical hernia mesh [Figure 5]. A ventrallex® ST hernia patch was used. The mesh was then reperitonealized using the hernia sac as a peritoneal cover due to the extremely thin peritoneum on the anterior abdominal wall [Figure 6]. The surgical operative time was 82 min.

Her recovery was uneventful, and she had no recurrence at six months post-surgical herniorrhaphy.



**Figure 6:** Hernia sac (blue arrow) used to re-peritonealize the mesh lateral to the right rectus muscle (green arrow)

## Discussion

A Spigelian hernia is often referred to as an interparietal hernia.<sup>[4,5]</sup> It remains a rare entity with a reported incidence of 2% amongst ventral abdominal hernias.<sup>[6]</sup> A clinical diagnosis of Spigelian hernia is possible in patients presenting with a palpable mass along the Spigelian aponeurosis, with or without increased abdominal pressure. An accurate clinical diagnosis of a Spigelian hernia may only be made in about one-half of patients.<sup>[7]</sup> Spigelian hernias are thought to be the only interparietal hernia of the abdominal wall, which contributes to the difficult clinical diagnosis.

Spigelian hernias lack characteristic symptoms of incarceration or strangulation. Symptoms include abdominal pain and a palpable lump. This pain may be aggravated by increased intraabdominal pressure. The presence of a palpable lump lateral to the rectus abdominis may confirm diagnosis. This is complicated by the tendency of the hernial sac to run caudally and laterally in the inter-oblique muscle space. Clinical assessment has a sensitivity of 99% and positive predictive value of 36%.<sup>[8]</sup> In patients presenting with focal tenderness or sharp pain within the region of the Spigelian aponeurosis, prompt radiological investigation is necessary for diagnosis.<sup>[7,8]</sup> CT scan has a sensitivity of 100% and positive predictive value of 100% and ultrasonography a sensitivity of 90% and positive predictive value of 100%.<sup>[8]</sup> Spigelian and other lateral ventral hernias require a high index of suspicion due to their high risk for incarceration and inconsistency in symptoms and physical examination.<sup>[1,4,9]</sup>

Ventral hernias are initially managed by conservative treatment, but a Spigelian hernia is the one exception.<sup>[10]</sup> High risk of strangulation and incarceration makes operative repair the mainstay of management through laparoscopic or open techniques.<sup>[11]</sup> Most patients are managed laparoscopically, with comparable rates of readmission, reoperation, and recurrence between

open and laparoscopic techniques.<sup>[12]</sup> Surgical options involve laparoscopic, robotic, or open procedures. Laparoscopic surgical herniorrhaphy has been shown to outperform open procedures in decreased length of stay and decreased rates of postoperative morbidity.<sup>[3,4,10]</sup> Both intraperitoneal and extraperitoneal techniques have been utilized in repair of Spigelian hernias. In an extraperitoneal repair, the hernial sac is identified and reduced by creation of an extraperitoneal space by open access and balloon dilation. The peritoneum is then dissected to provide a 5 cm margin around the defect for mesh overlap. The mesh is then utilized to cover the defect and secured with spiral tacks.<sup>[9]</sup> In intraperitoneal repair like the transabdominal pre-peritoneal repair, the peritoneum is opened, to create a pre-peritoneal space bound by peritoneal flaps. Mesh herniorrhaphy is favored due to the high rate of hernia recurrence versus a tissue repair.<sup>[13]</sup> Mesh is placed within the pre-peritoneal space and the peritoneum closed.<sup>[9]</sup> Mesh placement within the pre-peritoneal space allows for re-peritonealization of the mesh, avoiding direct contact between intraperitoneal viscera and the mesh.<sup>[14]</sup> Our case is unique in that the hernia neck was initially closed with a V-loc<sup>®</sup> barbed suture. This helped to reduce the surface area for the overlying mesh placement. It is postulated that hernia neck closure prior to mesh placement reduces the risk of hernia recurrence. Our initial attempt at conservative management was attributed to patient reticence and the ability of the patient to manually reduce the hernia. Manual reduction of a Spigelian hernia remains uncommon.<sup>[15]</sup> This may have been aided by her extremely thin abdominal wall musculature. The extra peritoneal approach is now the preferred approach for most hernia societies. The dangers of bowel adhesion to the mesh, though rare can have catastrophic consequences.

## Conclusion

Spigelian hernias are rare with a high risk of incarceration and small bowel obstruction inherent to their anatomy. The laparoscopic pre-peritoneal approach with hernial neck closure and mesh underlay is an effective method in Spigelian herniorrhaphy.

## Author contributions

Yagan Pillay: Proof of concept, primary surgeon and proof reading. Jake Reaser is the primary author for this article. Original literature search, writing of the article and references.

## Ethical policy and institutional review board statement

All ethical standards for publishing were adhered to and written consent was obtained for publication of the pictures used in this article.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

### Data availability statement

All relevant data are included in this article.

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Nil.

### Conflict of interest

There are no conflicts of interest.

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