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Case Report

Sandwich Technique of Closure of Spigelian Hernia: A Novel Technique

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Abstract

Spigelian hernia is a rare interparietal hernia accounting for 0.12-2.4% of all abdominal wall hernia. Herniation occurs through a defect or weakness in the Spigelian fascia, which is the aponeurotic layer between the lateral edge of rectus abdominis muscle medially and the semilunar line laterally. All presented with gradually enlarging swelling in the right or left iliac fossa, which showed complete reducibility and positive impulsion on coughing. Abdominal ultrasonography suggested the presence of abdominal wall defect of size ranging from 1 to 2.5 cm in maximum diameter at linea semilunaris line. On dissection, the defect was through the musculoaponeurotic sheath of the internal oblique and transverse abdominis muscle. After reduction of the contents, an underlay meshplasty with nonabsorbable prolene mesh was done. After the closure of the external oblique aponeurosis, another prolene mesh was put over the defect (onlay) so that the defect was sandwiched between the two prolene meshes. The skin and subcutaneous tissue was closed with a negative suction drain in all cases. 10½ months of mean follow-up revealed no recurrence. Hence, sandwich technique of closure of Spigelian hernia is a safe, feasible, acceptable, and associated with no short-term recurrence rates. However, long-term follow-up is needed to prove the efficacy of this technique.

Key words: Sandwich technique, Spigelian fascia, Spigelian hernia, Ventral abdominal hernia

INTRODUCTION

Spigelian hernia is a rare variety of ventral abdominal wall hernia, in which there occurs protrusion of pre-peritoneal fat, a sac of peritoneum or an organ through a defect or weakness in the Spigelian fascia, which is the aponeurotic layer between the lateral edge of rectus abdominis muscle medially and the semilunar line laterally.[1,2] The hernia was named after a Belgian anatomist Adriaan Van der Spieghel who was the first to describe the semilunar line or linea Spigeli in 1645 and it was first recognized by Josef Klinkosch in 1764.[3] It is also known as "spontaneous lateral ventral hernia" or "hernia of linea semilunaris."

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CASE REPORT

Four patients, three female and one male, with age ranging from 34 to 52 years (mean age 41.5 years) presented with gradually enlarging swelling in the lower abdominal wall. Three had swelling on the left iliac fossa and one in the right iliac fossa. The swellings enlarged in size on coughing and straining and were reduced in supine position. Colicky abdominal pain was present in two cases, but none of them presented with features of intestinal obstruction. There was no associated comorbid illness in any of the cases (Table 1). On examination, impulsion on cough was present with complete reducibility in all patients. Normal bowel sounds heard in all cases. Abdominal ultrasonography suggested the presence of abdominal wall defect of size ranging from 1 to 2.5 cm in maximum diameter at linea semilunaris line.

During surgery, a transverse incision was given over the hernia. On dissection, the defect was found along the lateral border of rectus sheath with the external oblique aponeurosis intact over it. The defect was through the musculoaponeurotic sheath of the internal oblique and

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transverse abdominis muscle. There was herniation of sac containing preperitoneal fat in one case (Figure 1), omentum in three cases (Figure 2). After reduction of the contents, an underlay meshplasty with nonabsorbable prolene mesh was done (Figure 3). After the closure of the external oblique aponeurosis, another prolene mesh was put over the defect (onlay) (Figure 4) so that the defect was sandwiched between the two prolene meshes. The skin and subcutaneous tissue was closed with a negative suction drain. Postoperatively, the patient had an uneventful recovery. Mean hospital stay was 4½ days (range 3-6 days). Sandwich technique, which was used to provide strength to the hernia defect revealed no signs and symptoms of recurrence within a mean follow-up period of 10½ month (Table 1).

DISCUSSION

Spigelian hernia is a rare interparietal hernia accounting for 0.12-2.4% of all abdominal wall hernia, with a female preponderance and occurring between 4th and 7th decades of life. "Spigelian hernia belt of Spangen" is a 6 cm transverse strip above the line joining both anterior superior iliac spines, where the Spigelian fascia is wider and weaker. About 90% of Spigelian hernias are found within this belt.[2] In most of the time, hernia sac passes through the transversus abdominis and the internal oblique aponeuroses and spreads out in the interstitial layer posterior to the external oblique aponeurosis, which is the most common type. The sac may spread in the interstitial layer between the transversus abdominis aponeurosis and the internal oblique muscle, which is comparatively less common and breach of external oblique aponeurosis so that the sac lies in the subcutaneous plane is the least common type.[4] In its early stage, there is protrusion of preperitoneal fat through the Spigelian aponeurosis. In the later stage, the peritoneal sac may enter containing greater omentum, small intestine, or part of the colon. Although rare, Spigelian hernias may contain an acutely inflamed appendix, Crohn's appendicitis, even an incarcerated Meckel's diverticulum.[5]

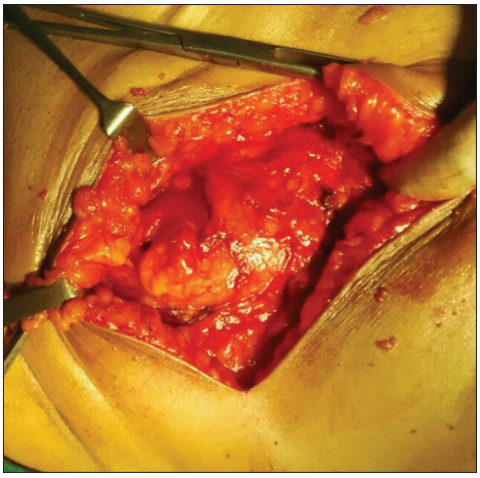

Figure 1: Hernial sac containing preperitoneal fat

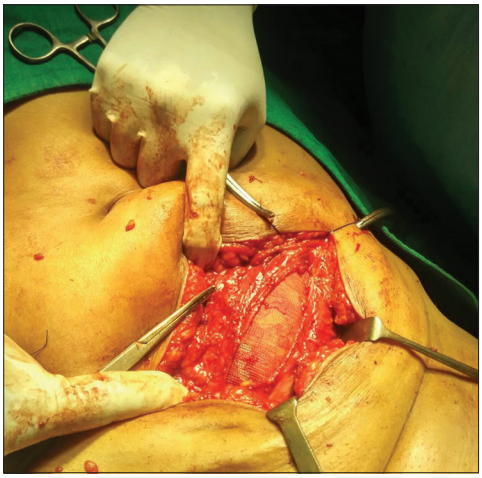

Figure 3: Underlay meshplasty with nonabsorbable prolene mesh

Figure 2: Hernial sac containing omentum

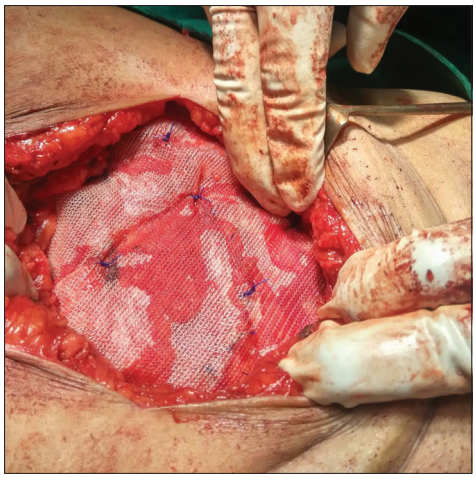

Figure 4: Onlay meshplasty with non absorbable prolene mesh

Table 1: Clinical characteristics of the patients

Patients	Age (years)	Gender	Side of defect	Co-morbidities	Contents of hernia sac	Post-operative complications	Hospital stay (days)	Follow up (months)
Patient 1	34	Female	Left	Nil	Pre-peritoneal fat	Nil	4	14
Patient 2	44	Female	Left	Nil	Omentum	Nil	5	12
Patient 3	36	Male	Right	Nil	Omentum	Nil	3	9
Patient 4	52	Female	Left	Nil	Omentum	Nil	6	7

The patients usually present with abdominal pain, a mass in the anterior abdominal wall or signs of incarceration with or without intestinal obstruction. Accordingly, the differential diagnosis includes rectus sheath hematoma, seroma, parietal abscess, lipoma, peritoneal tumor implants and pseudocyst at the end of the ventriculo-peritoneal shunts. Although operator dependent, ultrasonography is considered as the first line of investigation to detect the defect in the Spigelian fascia, due to its dynamic capability to perform a real-time examination in both supine and upright positions and while the patient performs a Valsalva maneuver.[6] Computed tomography scan and magnetic resonance imaging are only required if there is doubt in making the diagnosis.

Surgical repair of Spigelian hernia is recommended because of high risk of intestinal obstruction and strangulation. Surgery can be performed either by open technique or laparoscopically. Simple closure of defect in the form of herniorrhaphy was recommended by Spangen.[1] According to Nozoe *et al.*, hernioplasty by suturing the internal oblique and transversus muscles to the rectus sheath is an ideal procedure.[7] Nowadays in the era of tension free meshplasty, a nonabsorbable preperitoneal or onlay mesh repair is usually preferred for reconstruction. In 1992, Carter and Mizes reported the first laparoscopic repair for Spigelian hernia.[8] Intraperitoneal, transabdominal pre-peritoneal and total extraperitoneal laparoscopic techniques with underlay mesh placement have been described with significantly lower morbidity, shorter hospital stay and low recurrences rates.[2,9,10]

Regarding open approaches to surgery no procedure has been shown to have definitive advantages over others, especially in view of the rarity of these cases. Bleichrodt *et al.* used omentum-polypropylene sandwich technique for repair for abdominal wall defects.[11] Very less literature is available on using sandwich technique for repair of Spigelian hernia. In our study, we used a novel technique of sandwiching two prolene meshes in between the layers of abdomen to strengthen the defect in the Spigelian fascia showed a good result.

CONCLUSION

Sandwich technique repair of Spigelian hernia is safe, easy and novel idea to strengthen the Spigelian fascia. It provides better results in short-term follow-up without recurrences; however, long-term follow-up is needed to provide its efficacy.

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