

Strangulation and necrosis of right hemicolon as an extremely rare complication of Spigelian hernia

Georgios Velimezis¹, Nikolaos Vassos², Georgios Kapogiannatos¹, Dimitrios Koronakis¹, Christos Salpigidis¹, Evangelos Perrakis^{1,3}, Aristotelis Perrakis²

¹Department of Surgery, Western Attica General Hospital, Athens, Greece

²Department of Surgery, University of Erlangen-Nuremberg, Erlangen, Germany

³Department of Surgery, General Hospital Nikea, Piraeus, Greece

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Corresponding author:

Aristotelis Perrakis MD

Department

of Surgery University

of Erlangen-Nuremberg

Krankenhausstr. 12

91054 Erlangen, Germany

Phone: +49 9131 85 33100

Fax: +49 9131 85 36294

E-mail: aristotelis.perrakis@

uk-erlangen.de

Andrian van der Spigel was the first to describe the semilunar line, in 1645 [1]. The Spigelian aponeurosis is formed by the fusion of the aponeurosis of the internal oblique muscle and the aponeurosis of the transversus abdominis muscle. The linea semilunaris forms the lateral margin and the lateral edge of the rectus muscle the medial margin of the Spigelian aponeurosis. It extends from the costal cartilage of the 8th rib to the symphysis pubis [1–3]. In the upper abdominal wall, the Spigelian aponeurosis is posterior to the rectus muscle, making it difficult even for the experienced surgeon to locate a fascial defect during the physical examination. Superior to the umbilical region, the aponeurosis of the internal oblique crosses over the transverses, creating a strong abdominal wall barrier. Beneath the umbilical region the aponeurosis forms a weak barrier that is susceptible to protruding peritoneal sacs or extraperitoneal fat [1, 3–5]. Spigelian hernia was first reported by Klinklosch in 1764. More than half of all Spigelian hernias are located in a 6 cm wide region beneath the umbilicus and superior to the inferior epigastric vessels. This region is referred as “the Spigelian hernia belt” [1, 2]. The most common symptom of Spigelian hernia is pain (60%) due to contraction of the abdominal musculature. Another common symptom is a palpable abdominal mass in 35% of cases [6–17]. Predisposing factors were collagen disorders, age, obesity, rapid weight loss, multiple pregnancies, chronic pulmonary disease, trauma, iatrogenic causes and congenital disorders [3, 10, 18]. Once Spigelian hernia is diagnosed, there is a need for surgical treatment because of the high risk for serious complications. Emergency surgery is estimated to be performed in 21–33% of cases, due to incarceration and strangulation [2, 9–11, 15–22].

Here, we present a unique case of Spigelian hernia with incarceration and obstruction of the terminal ileum, appendix, cecum and right hemicolon that was treated with a major surgical procedure on an emergency basis.

A 70-year-old white female patient (body mass index: 34.2 kg/m²) referred to the Surgical Department of the Western Attica Hospital with abdominal pain in the right lower quadrant (RLQ), mild abdominal distention and progressive constipation. Her past medical history was significant for constipation symptoms, nausea and recurrent fever. Her past surgical history was not remarkable, and there was not a triggering effect for bowel entrapment. The physical examination revealed a 18 × 10 × 12 cm

palpable mass in the RLQ. The overlying skin was irritated with signs of an extended inflammatory reaction (Figure 1). Laboratory examinations revealed leukocytosis (16 700 white blood cells/ μ l) and a major electrolyte disorder (hypokalemia (3.0 mmol/l) and hyponatremia (129 mmol/l)). The plain abdominal X-ray examination revealed gas-fluid levels indicating large bowel obstruction (Figure 2). Due to these findings an immediate surgical intervention under general anesthesia was performed. The surgical exploration was carried out via a right pararectal anterior approach over the mass. Laparotomy confirmed a great mass pro-

truding through the neck of a Spigelian hernia of 15 × 8 × 10 cm size (Figure 3 A). After opening the hernia sac, strangulation of the cecum, terminal ileum and ascending colon with extended necrosis of the intestinal wall was found (Figure 3 B, C). A right hemicolectomy was performed (Figure 3 D), and the defect in the abdominal wall was repaired by Prolene Hernia System (20 × 15 cm) according to our technique [23]. The histopathological examination showed an extended necrosis, without any signs of malignancy. The patient was discharged on the 9th postoperative day after an unremarkable hospital course. The patient underwent a colonos-



Figure 1. Huge palpable mass in the right lower quadrant of the abdomen

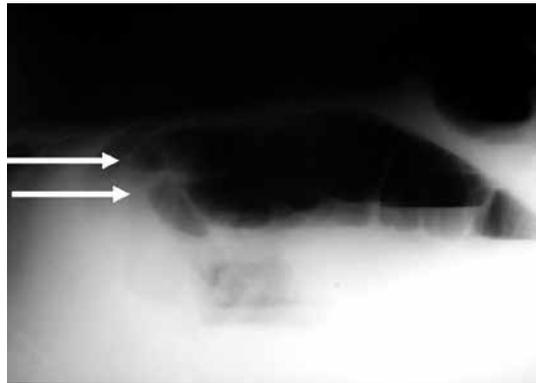


Figure 2. Plain abdominal X-ray examination with gas-fluid levels indicating large bowel obstruction



Figure 3. A – Inflammatory mass in subcutaneous tissue. B – Neck of Spigelian hernia. C – Necrosis of intestinal wall. D – Surgical specimen after right hemicolectomy

copy 12 weeks after surgical treatment in order to exclude a malignancy of the colon, and after 5 years of follow-up the patient is doing well without any evidence of hernia recurrence.

The most common symptoms of Spigelian hernia are pain (60%) and a palpable abdominal mass in 35% of cases [6]. Whether a Spigelian hernia should be diagnosed through physical examination remains a controversial matter: In more than 50% of cases the physical examination alone is not enough to establish the diagnosis [7]. However, according to Larson, patients' history and physical examination alone establish the diagnosis of Spigelian hernia in 74% of cases [8]. Many authors have reported that many Spigelian hernias may remain unclear until laparotomy is performed. Weiss *et al.* reported in a series of 178 patients that the preoperative diagnosis was correct in 92 (51.7%) cases [9]. The diameter of the neck is usually about 0.5–2 cm, and due to this fact the risk of obstruction and incarceration is high (21%) [10, 11]. The hernia sac usually contains preperitoneal fat or greater omentum, but there are cases in which the sac contains parts of the small bowel or other solid organs [2]. Colonic obstruction is, nevertheless, a very rare condition. To our knowledge, only 10 cases have been reported in the literature (Table I) [12–17]. Abdominal X-ray examination may show signs of ileus in case of incarceration but is not specific enough to reveal the cause of the obstruction. Ultrasonography and computed tomography can clearly define the defect of the abdominal wall as well as the contents of the hernia sac [19, 20]. Once Spigelian hernia is diagnosed, there is a need for surgical treatment because of the

high risk of further serious complications. Emergency surgery is estimated to be performed in 21–33% of cases, due to incarceration and strangulation [2, 9–11, 15]. The surgical procedures performed for repair of Spigelian hernia are generally classified as follows: open (primary suture repair, mesh-repair preperitoneal or intraperitoneal) and laparoscopic (intra- or preperitoneal). Open procedures are still widely used, because of the preoperative uncertainty of diagnosis and the high rate of emergency surgery, but the laparoscopic approach is gaining increased importance mainly in uncomplicated cases [11, 19, 21, 22].

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Georgios Velimezis and Nikolaos Vassos contributed equally to this manuscript.

Conflict of interest

The authors declare no conflict of interest.

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Table I. Reported cases with colonic obstruction secondary to a Spigelian hernia

N	Author (year)	Age/gender	Site of hernia	Involved segment	Type of surgery
1	Spielr (1980)	58/M	RLQ	Cecum and ascending colon	Right hemicolectomy
2	Le Joliff (1985)	72/F	LLQ	Descending colon	Hartmann operation
3	Le Joliff (1985)	63/F	LLQ	Sigmoid	No resection
4	Le Joliff (1985)	81/F	LLQ	Descending colon	Suture of the perforated site
5	Brahmbhatt (1990)	70/F	LLQ	Sigmoid	No resection
6	Benito (1999)	67/F	LLQ	Sigmoid	No resection
7	Losanoff (2001)	65/F	LLQ	Sigmoid	No resection
8	Fisichella (2007)	78/F	RLQ	Cecum	Not stated
9	Miller (2008)	57/M	LLQ	Sigmoid	No resection
10	Salemis (2010)	41/M	RLQ	Ascending colon, small bowel loop, portion of greater omentum	No resection
11	Our case	70/F	RLQ	Terminal ileum, cecum and ascending colon	Right hemicolectomy

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