

Small Bowel Obstruction Secondary to an Internal Hernia Through the Pouch of Douglas: A Case Report and Review of the Literature

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DOI: 10.31080/ASMS.2022.06.1234

Received: February 22, 2022

Published: April 13, 2022

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Abstract

Background: Internal hernias are an uncommon cause of small bowel obstruction. These are caused by the protrusion of viscera through defects in the mesentery or peritoneum. Pouch of Douglas hernias are an exceedingly rare type of internal hernia. As such, there are no standard guidelines for management.

Case Presentation: An elderly female presented with small bowel obstruction in the virgin abdomen, was found to have a recto uterine cul-de-sac or pouch of Douglas hernia via a computer tomography (CT) scan. Open reduction of the hernia followed by herniotomy was the method used to treat this patient.

Conclusion: Pouch of Douglas hernias are a rare type of internal hernia. It may be due to a congenital defect in the peritoneum or due to an acquired defect usually secondary to previous pelvic procedures. It may be identified via computer tomography (CT) and the definitive management is surgical due to the high risk of strangulation. Herniotomy or widening of the hernia defect, which decreases the risk of incarceration and strangulation, appears to be a valid method of definitive management of hernias within the Pouch of Douglas

Keywords: Computer Tomography; Douglas; Hernia

Introduction

Small bowel obstruction is a frequently encountered surgical emergency. According to the sixth patient report of the National Emergency Laparotomy Audit from December 2018 to November 2019, 47.4% of patients admitted to hospital who had an emergency laparotomy in England and Wales were patients who were found to have bowel obstruction [1]. Approximately 3-16% of cases of small bowel obstruction occur within the "virgin" abdomen, i.e., one in which there has been no prior surgery, radiotherapy or previously known inflammatory process. The causes include benign and malignant tumours, new onset inflammatory disease, bezoars, volvulus, intussusception, Meckel's diverticulum, gallstone ileus, and internal herniation [2].

An internal hernia is a protrusion of viscera through defects in the peritoneum or mesentery into the abdomen or pelvis. Internal

herniation is an exceedingly rare cause of bowel obstruction accounting for a mere 0.2-5.8% of cases [3]. Strangulation of an internal hernia is associated with a 50% mortality rate [4].

This case study describes small bowel obstruction secondary to a rarely encountered type of internal hernia, through the rectouterine pouch.

Case Presentation

A 96-year-old female presented to hospital with a four-day history of vomiting and one day history of constipation. She was diabetic and hypertensive (both of which were well controlled) and noted to be compliant with her follow up management of these chronic medical conditions at her local health centre. The patient described having generalized, intermittent, cramping abdominal

pain associated with multiple episodes of vomiting per day (food/gastric contents). This was followed by abdominal distension and the inability to pass stool. Of note, the patient had nil previous abdominal or pelvic surgical procedures. On examination, she was found to be dehydrated, tachycardic and afebrile. Her abdomen was distended but soft and non-tender with increased bowel sounds. Examination of the hernial orifices revealed a non-incarcerated, umbilical hernia. No abnormalities were discerned on digital rectal or vaginal examinations. Nasogastric drainage produced a litre of gastric contents. After adequate fluid and electrolyte resuscitation, an abdominal x-ray was done as part of her initial investigations, which revealed dilated loops of small bowel. The patient went on to have CT imaging of the abdomen and pelvis which again demonstrated dilated loops of small bowel with multiple air fluid levels throughout. A point of transition from dilated bowel to collapsed bowel was seen to the left of the uterus, with a closed loop pelvic portion containing dilated bowel. These findings seemed to suggest that her small bowel was herniating through a defect in the broad ligament of the uterus and thus this was one of the possible differential diagnoses in this patient. The patient was taken to theatre where an exploratory laparotomy via a midline incision (from the umbilicus to the pelvic brim), was performed. At laparotomy, she was found to have 15 cm of jejunum herniating through a defect in the recto uterine space or the Pouch of Douglas. A herniotomy was done to prevent reincarceration of bowel. Unfortunately, a small portion of the herniated segment of bowel was strangulated. This was resected and a jejuno-jejunal anastomosis created. The previously mentioned non-incarcerated umbilical hernia was also repaired primarily at the time of this laparotomy. The patient went on to have an uneventful recovery.

Figure 1: Showing defect in the pouch of Douglas as indicated by the forceps.

Figure 2: CT image showing clustering of bowel lateral to the uterus.

Discussion

As stated earlier, internal hernias are protrusions of viscera through defects in the peritoneum or mesentery. According to Myers, *et al.* these hernias may be classified into transmesenteric, transomental, paraduodenal, foramen of Winslow hernias, intersigmoid, pericaecal, pelvic and supravesical [5]. Pelvic hernias can be further subclassified according to the anatomical margin breeched into obturator (herniation through the obturator foramen), sciatic (protrusion through the lesser or greater sciatic foramen) and perineal hernias [6]. Perineal hernias are those which occur through the levator ani plate. These perineal hernias may be divided into anterior or posterior based on the relationship to the superficial transverse perineal muscle. Perineal hernias include the following:

- Hernias of the broad ligament of the uterus. This is the most common type of pelvic hernia.
- Internal supravesical hernias
- Hernias into the perirectal fossa
- Pouch of Douglas hernias

Pelvic herniae, may be due to congenital or acquired defects. Inflammation, trauma and previous surgery have been implicated in the development of acquired defects. Herniation of small bowel through the Pouch of Douglas are usually associated with the elderly multiparous females or those with previous pelvic/gynecological surgery.

Patients with internal herniae may have a range of presentations. They may be asymptomatic or present with signs and symptoms of acute small bowel obstruction such as nausea, vomiting, abdominal

distension and constipation. Others may complain of repeated bouts of intermittent gastrointestinal symptoms. This may occur due to incarceration followed by spontaneous reduction of the hernia.

Multi detector CT scan is the main method of diagnosis for internal hernias [5]. With pouch of Douglas hernias, CT imaging usually reveals a loop of dilated bowel posterior or lateral to the uterus, which tapers proximally, i.e., a closed loop obstruction, with clustering of intestinal loops within the rectouterine pouch.

Radial distribution of the stretched mesenteric vessels towards the transition point may also be discerned.

The risk of incarceration and strangulation of abdominal viscera secondary to internal herniae is high. Thus, the definitive management is surgical. Herniation through the pouch of Douglas is exceedingly rare. A search of the literature for Pouch of Douglas hernias utilizing the Pubmed central database retrieved 9 case studies. A summary of these cases and their management is listed below in table 1.

Author (Year)	Age of Subject	Virgin Abdomen	Management
Fiigaard, <i>et al.</i> [7] (1988)	17	Yes	Open reduction and primary closure of defect
Hoeffel, <i>et al.</i> [8] (1992)	76	Unknown	Open reduction and primary closure with small bowel resection and anastomosis
Inoue, <i>et al.</i> [9] (2002)	80	No – previous Hysterectomy	Open reduction and primary closure of the defect
Bunni, <i>et al.</i> [6] (2012)	77	Yes	Laparoscopic mesh herniorrhaphy
Suwa, <i>et al.</i> [10] (2013)	28	Yes	Open reduction and primary closure of the defect
Apturkar, <i>et al.</i> [11] (2013)	50	Yes	Open reduction and primary closure of the defect
Muthukumar, <i>et al.</i> [3] (2017)	74	No – previous hysterectomy	Open reduction and primary closure of the defect
Choi PW [12] (2017)	26	Yes	Open reduction and primary closure of the defect
Hari, <i>et al.</i> [13] (2020)	33	Unknown	Laparoscopic reduction and marsupialization of the defect

Table 1

From the table 1 of the cases were reported to have occurred in a virgin abdomen, 2 had previous pelvic surgeries and two cases did not identify whether the patient had previous surgery or not. The subject of this case report had open reduction of her internal hernia with herniotomy or widening of the hernia defect to prevent re-incarceration and strangulation of bowel. Hari, *et al.* similarly performed a herniotomy but also described marsupialization of the edges of the hernia ring, to avoid damage to surrounding/ underlying vasculature and to prevent bleeding [13]. The hernial defect of this 96-year-old patient was within the peritoneum directly posterior to the fundus of the uterus, well away from the peritoneal folds giving rise to the broad ligament. Thus, the risk of injury to the vessels running within the broad ligament was low

and so oversewing of the edges of the defect was not necessary. It was also quite easy to identify and avoid blood vessels within the thin, translucent peritoneum of this elderly woman [7-12].

Conclusion

Rectouterine pouch hernias are a rare cause of acute small bowel obstruction associated with a high risk of incarceration and strangulation. Herniotomy with widening of the defect was used for definitive management in this instance. Primary repair with and without mesh have also been described.

Declaration

The authors of this paper would like to declare that permission for use of clinical information and images were obtained from

the patient's legal guardians in the form of written consent. The patient's guardians are aware that all identifying information will be withheld to maintain anonymity.

Ethical approval for this endeavour beyond consent is not required.

There were no conflicts of interest.

Financial Support and Sponsorship

Nil.

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