

Broad ligament hernia as a rare cause of acute small bowel obstruction: A wolf in sheep's clothing – A case report with review of the literature

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ABSTRACT

Broad ligament hernia (BLH) is a rare clinical entity. It is a potentially life-threatening, yet often neglected and sometimes misdiagnosed surgical condition. We, herein report a case of acute small bowel obstruction in a 42-year-old female caused by internal herniation of the small bowel through a defect in the left broad ligament, which was successfully managed laparoscopically. We also reviewed the literature on BLH and present our recommendation on the diagnosis and management of BLH.

Key words: Bowel herniation, Broad ligament hernia, Internal hernia, Laparoscopy, Small bowel obstruction

Internal hernias (IH) are abnormal protrusions of a part or whole viscera through a defect in the mesentery or peritoneum contained within the abdominal cavity [1]. IH comprises <2% of all cases of intestinal obstruction [2]. Herniation of the small bowel through a defect in the broad ligament is rare and accounts for 4% of internal hernia [3]. Broad ligament hernia (BLH) is difficult to diagnose preoperatively due to non-specific vague abdominal symptoms. We, herein, report a case of small bowel obstruction due to a defect in the left broad ligament. It was diagnosed on a contrast-enhanced computed tomography (CECT) scan of the abdomen and subsequently managed laparoscopically.

CASE REPORT


A 42-year-old female was admitted with complaints of acute-onset, non-radiating, severe spasmodic lower abdominal pain, and vomiting (on one occasion with biliary contents) for 2 days. There was no aggravating or relieving factor for the pain.

She gave a history of having undergone lower segment Caesarean section through Pfannenstiel incision 3.5 years back. On general examination, she was dehydrated with a heart rate of 120 beats/min and blood pressure of 100/55 mmHg. A physical examination revealed diffuse tenderness in the lower abdomen. The abdomen was moderately distended and tympanic, with increased bowel sounds. Rectal examination revealed no tarry or bloody stools. A pelvic examination showed no cervical motion tenderness.

Blood analysis revealed raised inflammatory markers (leukocyte count of $14.0 \times 10^3/\mu\text{L}$ and C-reactive protein of 12.45 mg/dL). Other biochemical blood data and urine analyses were within normal range. A plain abdominal radiograph revealed dilatation of small bowel loops filled with gas over the central and lower abdomen. CECT of the abdomen showed several dilated small intestine loops with an abrupt transition in the left lower abdomen in the region of the left broad ligament. At the transition point, there appeared to be herniation of a loop of the distal ileum along with its mesentery posterior to the broad ligament through a defect in the left broad ligament suggestive of internal hernia. Herniated loops showed evidence of mural edema. The presence of free fluid in the pelvis with the fibroid uterus being displaced to the right was seen (Fig. 1). She was then taken up for surgery.

At laparoscopy, a 3 cm defect was noted in the left broad ligament (Fig. 2a). There was no bowel entrapment in the said defect, most probably because of spontaneous reduction of the contents during induction of anesthesia. A 'bowel walk' was performed thereafter which did not reveal any evidence of bowel ischemia, necrosis, or any other cause of obstruction. The defect was suture closed with 3-0 Mersilk (Fig. 2b and c).

The patient was discharged on post operative day 3 without any further complications. She was called for a follow-up visit in the outpatient department on a post-operative day 10, during which she was fine. Twenty-five months after her surgery, she continues to be asymptomatic (as per a telephonic interview conducted with her at the time of writing this paper).

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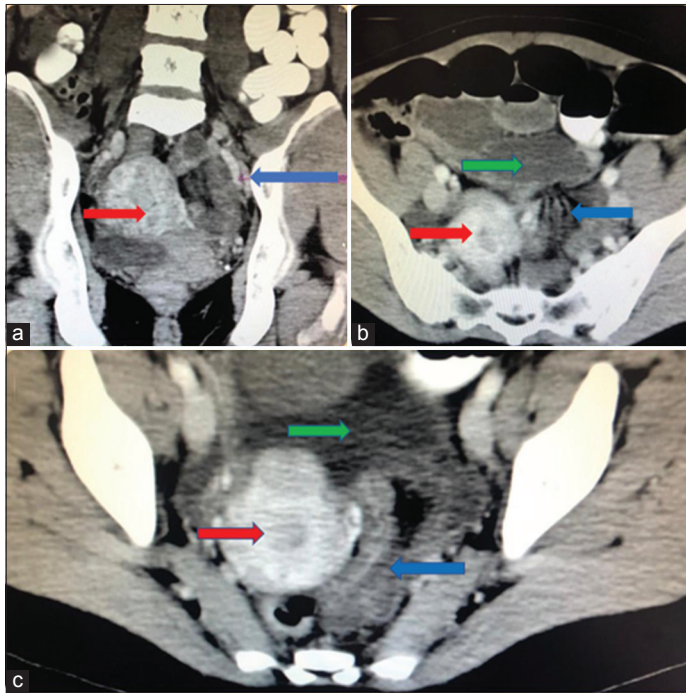


Figure 1: (a)-Coronal view CT scan showing point of transition lateral to the uterus (which is displaced to the right) with free fluid in the pelvis. (b)-Axial view with entrapped bowel and mesentery seen to the left side of the uterus (which is displaced to the right side). (c)-Axial view with entrapped small bowel loop seen in the pouch of Douglas. (Blue arrow-Bowel with mesentery, Red arrow-fibroid uterus slightly displaced to the right side, Green arrow-free fluid in the pelvis)

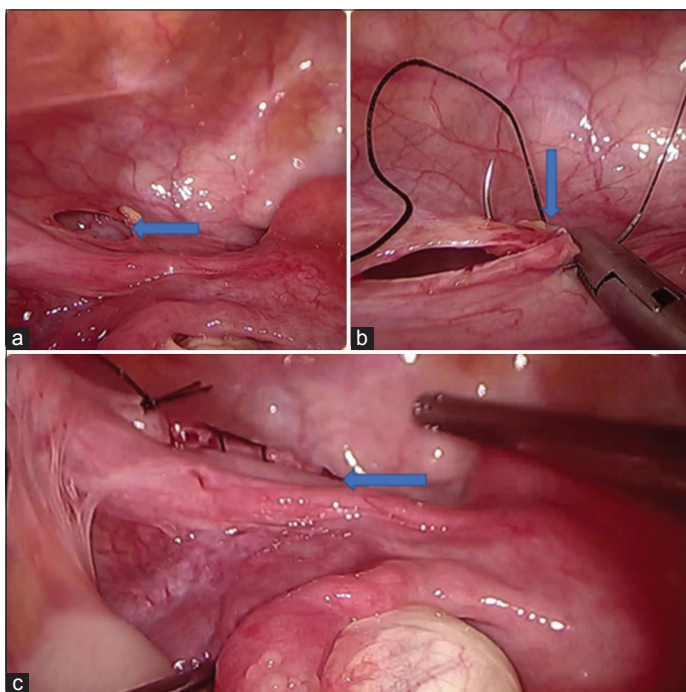


Figure 2: (a) Defect along left broad ligament. (b) Defect being suture closed with 3-0 Mersilk, (c) End result

DISCUSSION

BLH is a rare clinical entity accounting for just 4% of all IH [1]. Broad ligament defect (BLD) was first documented

in 1861 following a post-mortem of a woman who died from intestinal obstruction. The exact pathogenesis of the BLD is unknown. The defect can be congenital or acquired. Ruptured Mullerian duct cyst is the most common congenital cause. Acquired causes can be previous surgery, birth trauma, peritonitis, and pelvic inflammatory disease. Two systems for characterizing and distinguishing BLD have been described in the literature.

Hunt *et al.* in 1934 described the defect based on the nature of deficiency (complete versus incomplete fenestration). (a) Fenestra type: Most common type with a defect in both the peritoneal layers. (b) Pouch type: Defect in only one layer of peritoneum. (c) Hernia Sac type: A double layer of attenuated peritoneum lines the herniated bowel [4]. Cilley *et al.* in 1986 proposed anatomical location-based defect classification. Type I: Defect caudal to the round ligament, Type II: Defect above the broad ligament including defects in the suspensory ligaments of the ovary, mesosalpinx, and the utero-ovarian ligament. Type III: Defect between a round ligament and the remainder of the broad ligament through the meso-ligamentum teres [5,6]. Our case was fenestra type as per Hunt's and Type 2 as per Cilley's classification.

Clinical signs and symptoms of BLH can sometimes be non-specific and do mimic other pathological conditions of the abdomen. Diagnostic delay can potentially lead to bowel ischemia and gangrene with a high rate of mortality.

Multidetector computed tomography (MDCT) scan is the imaging modality of choice which provides high resolution and multi-planar images useful for planning surgical interventions. MDCT can identify: Transition zone located in the pelvis, dilated clustered small bowel loops herniated lateral to the uterus, increased distance between the uterus and one of the ovaries and ovarian deviation in the opposite direction [7]. In our case, we were able to identify the zone of transition lateral to the uterus on a computed tomography scan which helped us in planning the definitive treatment (Fig. 2a). In the modern laparoscopy era, many patients have been successfully managed by minimal access surgery. Like all IH, the clinical picture of BLH mimics a few other commoner clinical conditions which constitute the differential diagnoses for BLH. Some of these conditions are pelvic inflammatory disease, ruptured corpus luteal hematoma/cyst, ovarian cyst in torsion, appendicitis and acute typhilitis.

Laparoscopic surgery has played a vital role in both, diagnosis as well as treatment of patients with intestinal obstruction. The following principles of surgery should be adhered to irrespective of the mode of surgery (open or laparoscopy):- Reduction of the contents, excision of the sac where applicable, marsupialization of the hernial defect or suture closure with or without mesh reinforcement [8-10]. A review of the recent literature focusing on the preponderance of age of the patient, side of the BLH, its contents, mode of surgery, and whether preoperatively diagnosed are summarized in Table 1 [6,8-16].

Table 1: Review of the literature

Sr. no.	Authors (Ref. no.)	Side/Age	History of surgery	Preoperatively diagnosed	Mode of surgery/ contents	Special comments
1.	Rohatgi and Joshi, [6]	Left/35 years	Day 10 post Cesarean section	Yes	Laparoscopy/Small Bowel Loops	Only case in recent literature where Marsupialization was done
2.	Fernandes <i>et al.</i> [8]	3 cases Left/35 years, 43 years, and 51 years	None	Yes	Open/Small Bowel Loops	Defect closure done
3.	Matsunam <i>et al.</i> [9]	Left/36 years	Cesarean section	Yes	Laparoscopy/Small Bowel Loops	Defect closure done
4.	Koizumi <i>et al.</i> [10]	Right/41 years	None	Yes	Needlescopy/Small Bowel Loops	Use of 2-3mm instruments, defect closure done
5.	Sugishita <i>et al.</i> [11]	Left/71 years	Right Ovarian cyst Surgery	Yes	Laparoscopy/Small Bowel Loops	Defect closure done
6.	Takeyam <i>et al.</i> [12]	Left/52 years	H/o two parturitions	Yes	Single incision laparoscopy (SILS)/ sigmoid colon	Only case in recent literature done by SILS – Defect closure done
7.	Coronado <i>et al.</i> , [13]	Bilateral/36 years	None	Yes	Laparoscopy/Small bowel loops	Probably congenital as no history of past surgery and bilaterality
8.	Toolabi <i>et al.</i> [14]	Left/37 years	None	Yes	Laparoscopy/Small Bowel Loops	Defect closure done
9.	Zemour <i>et al.</i> [15]	Right/35 years	H/o Small Bowel surgery	Yes	Open/Small Bowel Loops	Defect closure done
10.	El-Madi <i>et al.</i> [16]	Left/13 months	None	No	Open/Urinary Bladder	Rare developmental defect associated with ipsilateral ovarian hypoplasia, renal agenesis and ureter blind ending which had VUR, normal functioning right pelvic kidney

CONCLUSION

Clinicians should have a high index of suspicion and add BLH to the list of their differential diagnoses while evaluating patients with abdominal symptoms, especially those presenting with chronic, vague, and non-specific symptoms. Early diagnosis and surgical repair prevent serious complications. BLH can be successfully managed with laparoscopy, even in acute presentations.

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