Case report

Broad ligament hernia: Two contrasting ways to a common goal – Two case reports with review of literature

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1. Introduction

Intestinal obstruction is a common clinical condition encountered in emergency rooms around the world. Internal herniae figure among it's rare causes and account for just about 1–2% of all cases [1]. Internal herniae are protrusions of the viscera through defects in the mesentery or peritoneum, contained within the abdomen. Broad ligament hernia (BLH) is a rare type of internal hernia and accounts for just 4% of all internal hernias [1]. It is difficult to diagnose due to its vague symptomatology [2]. It is mostly diagnosed intra-operatively and incidentally, at surgery. The treatment has evolved due to advances in the field of minimal access surgery.

Both these cases were surgically managed in a tertiary care, corporate, academic teaching hospital. The case 1 in this paper is the only reported case of BLH in literature, managed successfully by marsupialisation instead of the conventional suture-closure. We herein report a unique laparoscopic pictorial comparative study of two contrasting ways to surgical therapy of this rare condition. This study is reported in line with the SCARE criteria [3].

2. Presentation of the cases

The details of patient demographics, clinical presentations, radiodiagnosis, surgical therapy, post operative recovery and follow up information of our 2 patients are summarized (Fig. 1). None of the 2 patients were on any medications. They did not have a family history of internal abdominal hernia. Both patients are homemakers and gave no history of any addiction/s (smoking, alcohol etc.), drug dependance or psychological condition. Both had an acute presentation. On admission to the hospital they were kept nil per oral on continuous naso-gastric tube suction and were administered injectable anti-spasmodic and anti-emetic medications and intravenous fluids. Case 2 was accurately diagnosed pre-operatively while case 1 was not (Fig. 2). Case 2 was operated upon immediately after diagnosis while case 1 was given a one day trial of conservative management, failing which, she was operated upon, the next day. Both the surgeries were performed by a specialist advanced laparoscopic gastrointestinal surgeon. In case 2, during/ immediately after administration of anaesthesia, the contents of the left BLH reduced spontaneously. Hence, when the laparoscope was inserted,
|                      | Case-1                          | Case-2                          |
|----------------------|---------------------------------|---------------------------------|
| **Age**              | 35 years                        | 42 years                        |
| **Clinical presentation** | Features suggestive of bowel obstruction- colicky abdominal pain, vomiting, obstipation since 2 days. The patient underwent cesarean section 10 days back. | Features suggestive of bowel obstruction like abdominal pain, bilious vomiting, constipation since 1 day. There was no history of previous abdominal surgery. |
| **Examination findings** | Distended, tympanic abdomen with marked central and lower tenderness, hyperperistalsis and an empty rectum on per rectal exam | Distended, tympanic abdomen with lower mild tenderness, normal bowel sounds and minimal soft normal colored stools noted on per rectal exam |
| **Preoperative diagnosis** | No                              | Yes                             |
| **Blood investigations** | Leukocytosis – 14,000           | Leukocytosis- 15000             |
| **X-ray abdomen (Erect)** | Multiple air fluid levels in step ladder pattern in central abdomen | Multiple air fluid levels in lower abdomen |
| **CECT abdomen** | Revealed free fluid and a transition zone between proximal two-thirds and distal one-third of the small bowel to the left side of the uterus. There was failure of the oral contrast to pass across | Showed several dilated small bowel loops with an abrupt transition in the left lower abdomen in the region of the left broad ligament. At the zone of transition, there appeared to be herniation of distal ileum along with its mesentery posterior to the broad ligament through a defect in the left broad ligament suggesting a broad ligament hernia |
| **Diagnostic laparoscopy** | Internal herniation of the small bowel through a 5-cm defect in the left broad ligament | A 3 cm defect was noted in the left broad ligament, no bowel entrapment most probably due to spontaneous reduction of the contents |
| **Treatment** | Laying open of the defect in the broad ligament due to massive distention, edema & friability of the proximal small bowel | The defect was suture closed |
| **Duration of surgery / Length of stay** | 50 minutes / 6 days             | 60 minutes / 4 days             |
| **Immediate postoperative recovery / Recurrence of symptoms** | Uneventful / No                  | Uneventful / No                  |
| **Duration of follow up** | 37 months                       | 32 months                       |

Fig. 1. Summary of patient demographics, clinical features, workup, treatment and follow up information.
Fig. 2. Comparison of CECT Abdomen axial views – Case 1 shows the point of transition in the small bowel to the left side of the uterus. Case 2 shows contrast filled dilated small bowel with holdup & slow movement in the left lower abdomen. Green arrow shows free fluid in the pelvis, red arrow shows fibroid uterus slightly deviated to the right & blue arrow shows small bowel with developing ‘mesenteric swirl’ – all suggestive of a left BLH.

Fig. 3. Comparison of laparoscopic ‘first look’ appearances: Case 1 - blue arrow shows herniated small bowel through the broad ligament defect & the overlying normal ovary with gangrenous fallopian tube. Case 2 - blue arrow shows the defect after presumed spontaneous reduction of entrapped bowel.

Fig. 4. Comparison of surgical therapy: Case 1 - blue arrow shows division of utero-ovarian ligament being performed on the way to marsupialisation of the defect. Case 2 - blue arrow shows the broad ligament defect being suture closed.
just the defect in the broad ligament was identified without any entrapped bowel loops. In case 1, there was no spontaneous reduction of contents and the patient had entrapped small bowel along with markedly dilated proximal small bowel, which was edematous and inflamed. Also the fallopian tube was gangrenous (Fig. 3). Hence a decision to marsupialize the defect and perform a salpingectomy was taken, while preserving the blood supply of the ovary (Fig. 4). This is the only reported case of BLH in recent literature, in which the hernial defect was laid open, for the aforementioned reasons. Thus, in patients who have tightly entrapped, edematous, friable, distended and irreducible bowel within an internal hernia, it is preferable to avoid aggressive taxis and risk bowel injury, where possible. In case 2, due to spontaneous reduction of contents of the BLH, the defect was suture closed (Figs. 4 & 5). These 2 surgeries were performed with the patient in supine position and firmly fixed/strapped to the table, so as to allow steep Trendelenburg, reverse Trendelenburg as well as right and left side up positions. The operating surgeon stood on the contralateral side with the monitor at the ipsilateral foot end. Postoperatively both patients were kept nil-per-oral and were administered injectable antibiotics and intravenous fluids. Case 1 was started on oral feeds (initially liquid followed by semisolid) on postoperative day (POD) 3 while case 2, on POD 2; after resumption of bowel sounds and per rectal passage of flatus. Both tolerated the oral feeds well and were discharged from the hospital on POD 4 and POD 3 respectively. On their outpatient department follow up visits (POD 10), their wounds had healed well and they were asymptomatic. At the time of writing this paper, a telephonic interview was conducted with them; 37 and 32 months after their respective surgeries. None of the patients reported recurrent symptoms in the interim and they continue to be asymptomatic.
3. Discussion

Broad ligament defect leading to bowel obstruction was first reported by Quain in 1861 [4]. BLH is also known as the Allen and Masters syndrome, since they were the first to publish a case series on BLH, in 1955. The etiopathogenesis of a broad ligament hernia is not known but the causes can be grouped as either congenital or acquired. Congenital broad ligament defects are generally bilateral whereas acquired defects are mostly unilateral. Causes of acquired defects are previous surgery, pregnancy, birth related trauma or previous pelvic inflammatory disease which increases the intra-abdominal pressure.

The first classification of broad ligament defects was described in 1934 on the basis of peritoneal involvement of the defect, by Hunt [5] (Fig. 6).

1. Fenestra type: Presence of defect in the two peritoneal layers (most common).
2. Pouch type: Defect affects only one layer of the peritoneum.
3. Hernia sac type: The bowel is lined by a weak layer of peritoneum leading to formation of an internal hernia within a sac.

In 1986, Cilley et al. proposed the classification based on anatomical location [6,7].

1. Type I: defect caudal to the round ligament.
2. Type II: defect above the broad ligament including defects in the suspensory ligaments of the ovary, mesosalpinx and the utero-ovarian ligament.
3. Type III: defect between the round ligament and the broad ligament (through the meso-ligamentum teres).

The classical radiological features of broad ligament hernia were first described by Balthazar et al. The investigation of choice is a contrast enhanced computed tomography (CECT) of the abdomen [8]. The classical features suggestive of a broad ligament hernia are closed loop obstruction, small bowel dilatation, double transition point in the pelvic location lateral to the uterus, slight deviation of the uterus to the contralateral side and the presence of free fluid in the pelvis.

With the recent advances made in the field of minimal access surgery, laparoscopic surgery has become an important tool in the armamentarium of the surgeons in making a prompt diagnosis and early management of this rare and potentially dangerous surgical condition [18]. A review of recent literature on BLH is summarized (Fig. 7).

4. Conclusion

BLH is a rare clinical entity which requires a high index of suspicion for it to be detected in both, patients presenting with symptoms of acute
intestinal obstruction; as well as those who present with vague recurring lower abdominal symptoms. Prompt diagnosis and early management is necessary to prevent life threatening complications associated with BLH. Following the advent of minimal access surgery, BLH can be successfully managed by laparoscopy, even in acute settings.

Timeline of events.

| Day | Events – case 1 | Events – case 2 |
|-----|-----------------|-----------------|
| 0   | Presented with intestinal obstruction and underwent investigations | Presented with intestinal obstruction and underwent investigations |
| 1   | Given trial of conservative management | Underwent laparoscopic suture closure of left BLH defect |
| 2   | Underwent diagnostic laparoscopy followed by marsupialisation of left BLH | Kept nil-per-oral on antibiotics & intravenous fluids |
| 3   | Kept nil-per-oral on antibiotics & intravenous fluids | Passed flatus and started on liquids per orally |
| 4   | Passed flatus and started on liquids per orally | Passed flatus and started on liquids followed by semisolid diet, which was tolerated |
| 5   | After liquids were tolerated, started on semisolid diet | Had 1st bowel movement & was discharged |
| 6   | Had 1st bowel movement & was discharged | POD On 1st follow up visit - asymptomatic |
| POD | On 1st follow up visit - asymptomatic | On 1st follow up visit - asymptomatic |

Abbreviations: BLH-broad ligament hernia, POD-post operative day.

Sources of funding

None.

Ethical approval

This type of study does not require any ethical approval at our institution.

Consent

Written informed consent was obtained from the patients for publication of these case reports and accompanying images. Copies of the written consents are available for review by the Editor-in-Chief of this journal on request.

Contributor

Natasha Nanda, M D: Selection & markup of radiology pictures.

Registration of research studies

Not applicable.

Guarantor

Abhijit Joshi.
**Provenance and peer review**

Not commissioned, externally peer-reviewed.

**CRediT authorship contribution statement**

1) Yash Rohatgi: Writing – Original draft, Visualization.
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3) Vanita Raut: Writing – Review & Editing, Supervision.
4) Abhijit Joshi: Conceptualization, Validation, Resources, Writing – Review & Editing, Visualization, Supervision, Project administration.

**Declaration of competing interest**

None.

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