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Case Report

Laparoscopic management of a small bowel obstruction: paraduodenal hernia

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ABSTRACT

Paraduodenal hernia are very rare but the commonest internal hernia. Left paraduodenal hernia is due to herniation of the small bowel into the fossa of Landzert. The fossa results from a combination of failure of fusion of the small bowel mesentery with the retro peritoneum and malrotation of the midgut. Here we present a 27 years lady who saw multiple consultants with varied presentations and underwent extensive investigations over a one-year period, with one consultant referring her to a psychiatrist for malingering. CT scan revealed a foramen of Winslow hernia. The radiologist has to be aware of the CT findings of this unusual hernia. At laparoscopy, it was a left paraduodenal containing small bowel. We reduced the contents and plicated the sac with closure of the mouth. Patient did well and was discharged on 3rd post-operative day. On follow up she is doing well.

Keywords: Paraduodenal hernia, Fossa of Landzert, Laparoscopy, Internal hernia

INTRODUCTION

Internal abdominal hernias either congenital or acquired are rare conditions, accounting for 0.9% of all intestinal obstructions.[1] Paraduodenal hernias (PDH) are rare types of hernias and constitute half of all internal abdominal hernias. They occur when the small bowel herniates into the paraduodenal fossa and can manifest as acute or recurrent subacute intestinal obstruction.[2] They also can present as nonspecific abdominal pain of long duration visiting multiple hospitals. Anatomically and embryologically there are many potential paraduodenal recesses (Figure 1) but two are very common, the left and right paraduodenal recess. It involves small bowel herniating through a congenital opening in the mesenteries resulting from incomplete malrotation of midgut, defective adhesion between the mesentery with the retroperitoneum to form a potential space near the ligament of Treitz. Herniation into the left paraduodenal fossa (fossa of Landzert) occurs more frequently than herniation into the right fossa (fossa of Kolb/Waldeyer).[3] There is a male sex predominance for PDH. Early clinical diagnosis is difficult and high index of suspicion is required. These internal hernias may result in closed-loop bowel obstruction resulting in strangulation and perforation.[4] More frequently paraduodenal hernias are seen on radiological imaging.

At times they are typically detected incidentally at autopsy or laparotomy. Therefore, a timely and correct diagnosis with a rapid diagnostic tool is mandatory to avoid major morbidity and mortality.[5] Early surgical intervention whether by laparoscopy or laparotomy to reduce the herniation and close the mouth of the hernial sac with or without excision of the sac should be undertaken.

Here we are presenting a rare case report of a young woman who visited multiple hospitals and consultants over a one-year period. In fact, she was referred to a psychiatrist, because a consultant thought she was malingering!

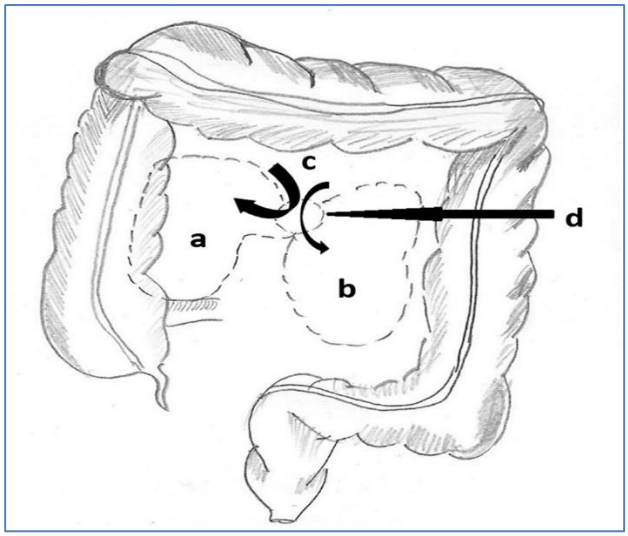

Figure 1: General anatomy of paraduodenal recess.
A line diagram showing the anatomical positions of the paraduodenal fossae (a) fossa of Waldeyer (right PDH occurs); (b) fossa of Landzert (left PDH occurs); (c) the retro-duodenum from where the hernia occurs, and (d) hernia orifice.

CASE REPORT

A 27 years old lady, psychologist in a premiere institute in Bengaluru, India presented with a 9 months history of experiencing abdominal cramps after meals, at times a dull aching pain in the epigastric region, which was relieved by vomiting and passing stools. Altered bowel habit in the form diarrhea without blood or mucus was also present. Another vital history that she observed was feeling of fullness and early satiety. There was significant loss of weight, to be precise she lost 16 kgs in 5 months. No history of fever, hematemesis, melena. She had no significant past medical or surgical history. With this clinical history, the probable diagnosis of peptic ulcer, IBD, IBS, TB (Indian), GIT lymphoma, SMA syndrome was considered.

Figure 2: OGD showing a subtle extrinsic impression on the posterior inferior part of the gastric body.

Clinical examination and basic blood investigations were unremarkable. Upper GIT endoscopy (OGD, Figure 2) revealed a very subtle extrinsic impression on posterior inferior wall of the gastric body. Abdominal USG scan pointed to only cholelithiasis. In the mean time she developed alternating diarrhoea with constipation. So, colonoscopy (Figure 3) was performed visualising the terminal ileum also, which was unremarkable.

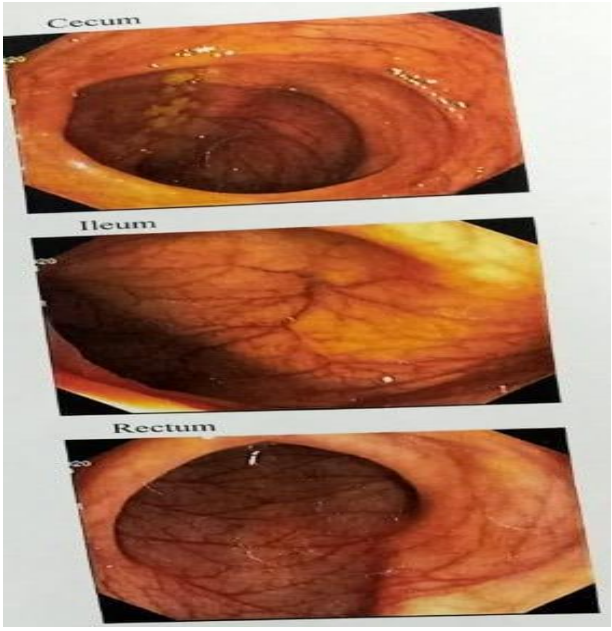

Figure 3: Normal colonoscopy finding.

When this workup was on, she took a second and a third opinion (in a different state). There she was diagnosed to be malingering and referred to a psychiatrist, which however she laughed it off without consulting and returned to the primary gastroenterologist. This is when she was referred to us for a surgical opinion and a possible diagnostic laparoscopy. Reviewing her history and investigations so far, we ordered a multislice helical CECT (oral and IV contrast) (Figure 4 and 5) of abdomen. This showed a positive finding of cluster of gas/dye containing small bowel loops seen in the lesser sac without obstruction/strangulation.

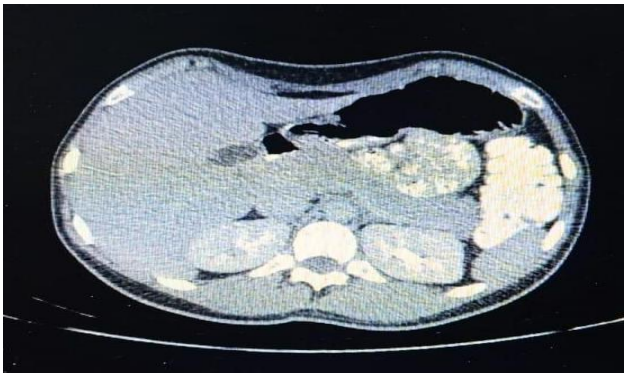

Figure 4: Scan showing contrast filled loops in the lesser sac between the stomach and pancreas.

The aortomesenteric angle was normal and small volume normomorphic LNs seen in the RP. With the above described findings, a foramen of Winslow internal hernia was reported by the radiologist.

Figure 5: Scan showing contrast and air-filled loops of small bowel in the lesser sac between the stomach and pancreas or kidney.

The patient was counselled for surgery after PAC a week before surgery. Unfortunately, with COVID pandemic the entire country went into lockdown, it became tricky to operate on a semi emergency SAIO. My hospital was a referral and screening hospital for COVID, we also had COVID positive patients in ICU. She was counselled about the present scenario and risks involved telephonically. Fully aware she consented and was admitted. A review PAC was done to rule out any further comorbidity (COVID). Abdomen was approached laparoscopically through the umbilicus (Hassan technique) and a thorough survey was done. Something interesting came up! It showed nothing in the supra colic compartment in the subhepatic space near the foramen of Winslow. Then we put extra ports to explore the small bowel in the infra colic compartment after lifting the transverse colon. The operative findings included, presence of small bowel mostly jejunum in the lesser sac along with significant adhesions which had herniated through the left paraduodenal fossa. The hernia sac extended behind the inferior mesenteric vein, anterior to the aorta and superiorly across the pancreas and transverse mesocolon to enter the lesser sac enclosing the entire jejunum and proximal ileum. She underwent a laparoscopic reduction of small bowel and adhesiolysis from lesser sac thru the hernia sac opening under GA. However, the proximal part of the jejunum near the DJ flexure was very adherent, so converted to a laparoscopic assisted procedure by making a small 2 inches supraumbilical mini laparotomy for further adhesiolysis and the entire small bowel was restored to its anatomical position. The entire peritoneal sac was inverted into the infra colic compartment and the defect between the inferior mesenteric vein (IMV) and posterior abdominal wall containing aorta was plicated (Figure 6) with a continuous non-absorbable suture along with closure of its mouth to prevent further herniation taking extreme care not to injure the IMV. The patient was allowed orals on first postop day with minimal analgesic requirement. She had a smooth post-operative recovery and discharged on the 3rd post-operative day. On follow up she is doing well.

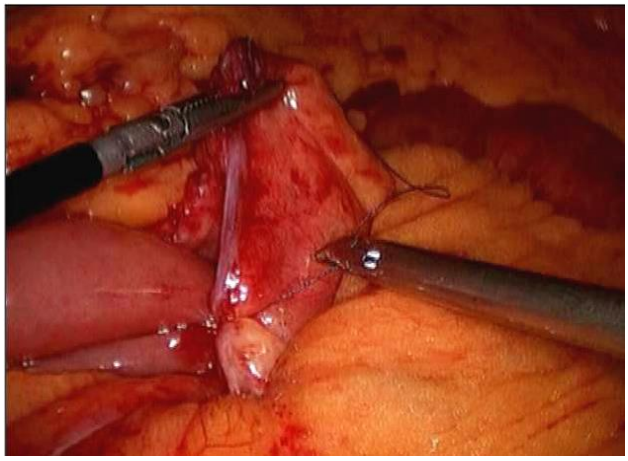

Figure 6: Laparoscopic repair of left PDH.

DISCUSSION

Internal hernias result from protrusion of the viscera through an opening in the peritoneum or mesentery. Internal hernias have a low incidence of <1% and represent a relatively small amount of presentations.[1] Neubauer, in 1786, is credited with the first description of PDH in the history of medical science.[6] He ascribed it to faults in peritoneal development. Nearly a century later, Treitz described the peritoneal folds and fossae, through which the hernia retro-peritonalis develops. Over these years, several theories on the development of PDH were formulated and discarded. It is accepted well now, the left paraduodenal fossa results from failure of mesenteric fusion with the parietal peritoneum and malrotation of the midgut while returning into the abdomen during the early weeks of gestation so embryologically resulting in development of a potential space.[7,8] Vasculature helps cluster of small bowel loops behind the IMV or left colic artery (which are contained in anterior sac wall) to aggregate in the left anterior pararenal space, between stomach and pancreas, lateral to ligament of Treitz. In the 5th week of embryonic development, the rapidly elongating midgut herniates into the umbilical cord. Later, the herniated midgut undergoes a counter-clockwise rotation of 90° around the superior mesenteric artery (SMA), leaving the pre-arterial limb on the left side. The herniated intestinal loop, first the pre-arterial then the post-arterial limb, returns to the abdominal cavity by the 10th week. During this process, the intestinal loop undergoes another 180° counter clockwise rotation. In the end, the pre-arterial limb lies to the left of SMA and the post-arterial limb lies superior and to the right of SMA. Under normal circumstances, fusion of the

mesocolon with the peritoneum of the body wall follows this process. Failure of the fusion to take place in time leaves a potential space (the fossa of Landzert) behind the mesocolon. While rotating into the peritoneal cavity, the mesentery fails to fuse with the parietal peritoneum creating a hernia orifice. Small bowel loops can become trapped between the mesocolon and the posterior abdominal wall when they herniate through this orifice, lateral to the fourth segment of the duodenum, the paraduodenal fossa of Landzert. Remember that the 3rd and 4th portions of the duodenum are retroperitoneal. It crosses from right to left, wraps around the head of the pancreas, passes over the aorta and under the SMA, and becomes intraperitoneal at the ligament of Treitz (which is the peritoneal reflection). The colonic mesentery forms a basket that holds the small bowel loops. The small bowel can spill out of the basket over the rim, but it can't pass below the rim unless there is a hole in the basket (mesentery).[9] LPDH occurs when small intestine prolapses posteroinferiorly into this fossa (of Landzert), which is bounded by the fourth part of the duodenum, the posterior peritoneum, the inferior mesenteric vein, and left branches of the middle colic artery. Up to nine types of fusion failure have been described but of surgical importance are the right and left paraduodenal recess. Treitz has dictated three necessary prerequisites for the occurrence of left paraduodenal hernia presence of a fossa; presence of inferior mesenteric vein in neck of the sac; sufficient mobility of the small bowel to allow it into the sac derived from this fossa.

Paraduodenal hernias account for 30-50% of all internal hernias, which are also the most common type of congenital internal hernias. However, the incidence of post-operative internal hernias has been increasing recently. Paraduodenal hernias into the left paraduodenal fossa of Landzert are three times 75% more common than those into the right paraduodenal fossa of Waldayer. Patients most commonly present in the 4th to 5th decades of life with the mean age of 38.5 years and there is a 3:1 male preponderance.[4] Presentation is variable depending on the severity of the hernia sequelae and this may result in small bowel incarceration, obstruction and subsequent ischemia. Approximately 50% of patients recall previous recurring abdominal pain of nonspecific nature. Physical examination in an elective scenario is unremarkable. Patients with LPDH have a 50% lifetime risk of hernia incarceration with 20-50% mortality for acute presentations; hence, operative management is recommended regardless of symptoms.[6] As such, the entity poses a diagnostic challenge, with majority of cases identified only at operation. However, small bowel contrast radiography (BMFT) is helpful in the pre-operative diagnosis. The classical finding of cluster of small bowels in the upper outer quadrant and absence of small bowel in the pelvis should alert a diagnosis of PDH on BMFT. The advent of computed tomography (CT) has eased the brain-storming sessions previously required to arrive at the diagnosis. Presently the most effective preoperative diagnostic tool is the computed tomography scan.[11,12] The classical findings in the diagnosis of left paraduodenal hernia which the radiologist should be aware of is, cluster of small bowel loops in the left anterior pararenal space and the cluster of small bowel loops behind the IMV and ascending left colic artery.

Additional finding of compression on the posterior stomach and distal duodenum results in inferior displacement of transverse colon and shifting of the superior mesenteric trunk to the right, but in general normal vascular relationship of SMA artery and vein is maintained. In our case, the presentation was so varied and we had to investigate her extensively to diagnose an internal hernia on CT scan (foramen of Winslow), which again turned out otherwise on laparoscopy (left PDH). However, instances of acute abdomen warrant omission of pre-operative imaging and immediate exploratory laparotomy/laparoscopy.

Treatment methods reported in the literature include laparoscopy or laparotomy. However, exploratory laparotomy is more often reported, especially in the setting of an acute complication such as strangulation, perforation, or large distension from obstruction. In addition, laparotomy may be more appropriate in circumstances where laparoscopy may not be possible or dangerous such as significant adhesions, haemodynamic instability, and contraindication to pneumoperitoneum. Nonetheless, the laparoscopic approach to management of this condition has become increasingly prevalent in the literature. Regardless of the approach, basic principles of hernia repair are adopted, namely reduction of hernia contents and repair of hernia defect. Excision of the hernia sac has been described but is not mandatory given the potential for injury to the colic vessels. The other option is plicate the entire hernia sac thereby obliterating the cavity and the mouth of the hernia opening. Correct identification and preservation of the vascular structures that constitute the hernia neck is essential. Rarely, widening of the hernia neck is required to reduce the contents and may involve incision of constricting peritoneal fold inferiorly and even division of the inferior mesenteric vein in more difficult cases. In doubtful cases of vascular compromise, we can apply a bulldog vascular clamp over the vessel and observe for ischemia of the colon.

This case is particularly interesting for a few reasons. Firstly, the patient's demography is not typical of this disease. Our patient was a young female, while reported cases more commonly describe males in the 4th to 5th decades of life. After reading the CT report, we concluded that it was foramen of Winslow hernia. But during laparoscopy, it was interesting to find a left paraduodenal hernia.

CONCLUSION

In conclusion, PDH are rare and remains elusive in its diagnosis. A reliable anatomical knowledge of the

peritoneal and mesenteric folds and, in cases with chronic recurrent abdominal pain with partial obstruction, a high degree of suspicion and awareness are of paramount importance. The technological advantages of radiology should be sought early in such cases, so that a prompt surgical intervention prevents the high morbidity and mortality associated with PDH. Though radiological investigations are helpful it should not delay definitive treatment in an unwell patient. Computed tomography remains the gold standard imaging modality for early diagnosis, so it is important for the radiologist to be aware of the image findings of these uncommon hernias as our case highlights. Based on our experience and current literature, we believe that laparoscopic or laparoscopic assisted approach is the optimum treatment strategy for patients with paraduodenal hernia, especially in centres with good experience in advanced laparoscopy.

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REFERENCES

1. Khan MA, Lo AY, Maele VDM. Para-duodenal hernia. Am J Surg. 1998;64:1218-22.
2. Tong RS, Sengupta S, Tjandra JJ. Left paraduodenal hernia: case report and review of the literature. ANZ J Surg. 2002;72:69-71.
3. Liew KL, Choong CS, Shiau GF. Descending mesocolon defect herniation: case report. Changgeng Yi Xue Za Zhi. 1999;22:133-7.
4. Manji R, Warnock GL. Left paraduodenal hernia: an unusual cause of small bowel obstruction. Can J Surg. 2001;44:455-7.
5. Zonca P, Maly T, Mole DJ. Treitz's hernia. Hernia. 2008;12:531-34.
6. Brigham RA. Paraduodenal hernia. In: Nyhus LM, Condon RE. (ed.) Hernia. 4th ed Philadelphia: Lippincott Williams and Wilkins; 1995.
7. Moynihan GBA. On retroperitoneal hernia. New York: William Wood and Co; 1906.
8. Andrews E. Duodenal Hernia: a misnomer. Surg Gynecol Obstet. 1923;37:740.
9. AJR entitled Review of Internal Hernias: Radiographic and Clinical Findings. Available at https://www.ajronline.org/doi/10.2214/AJR.05.064.
10. Ghahremani GG. Abdominal and pelvic hernias. In: Gore RM, Levine MS, eds. Textbook of gastrointestinal radiology, 2nd ed. Philadelphia, PA: Saunders; 2000: 1993-2009.
11. Mostafa D, Feky E, Morgan MA. Radiopaedia. Available at: https://radiopaedia.org. Accessed on 3 March 2020.
12. Dyananda L, Sreekumar KP, Moorthy S, Prabhu NK. Para-duoenal hernias: a pictorial essay. Indian J Radiol Imaging. 2006;16:469-71.
13. Brigham RA, Fallon WF, Saunders JR, Harmon JW, D'Avis JC. Paraduodenal hernia: diagnosis and surgical management. Surgery. 1984;96:498-502.
14. Masaki F, Akio K. Laparoscopic Surgery of Left Paraduodenal Hernia. J Laparoendosc Adv Surg Tech. 2004;14:111-5.
15. Bartlett MK, Wang C, Williams WH. The surgical management of paraduodenal hernia. Ann Surg. 1968;168:249-54.

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