

Right Paraduodenal Hernia: A Rare but Elusive Diagnosis

Prashant K Singh¹, Mamadur MR Shankar²

ABSTRACT

Aim: The aim of the study was to highlight the diagnostic dilemma in diagnosis of right paraduodenal hernia.

Background: Internal abdominal hernias account for nearly 0.9% of all intestinal obstructions. Paraduodenal hernias (PDH) constitute nearly 50% of all internal hernias, left PDH being 3 times more common than right PDH. Initial presentation is nonspecific, but if missed can present with catastrophic outcomes (i.e., small bowel obstruction, ischemia, and bowel perforation).

Case description: A 38-years-old gentleman was presented to emergency department with acute onset, intermittent colicky pain abdomen in the right lower quadrant with 2 episodes of vomiting of one-day duration. On examination, fullness in the right lumbar and iliac fossa region was noted and bowel sounds were found to be increased. Routine investigations were normal and USG Abdomen was inconclusive. CECT abdomen showed clustering of small bowel loops on the right side with bowel loops behind the SMA and SMV suggestive of right PDH. The patient was taken up for an emergency laparotomy. Intraoperatively, small bowel was seen herniating below the D3 of duodenum and clumped in the right iliac fossa. Superior mesenteric vessel was seen at the neck of the sac. A full Catell-Brasch maneuver was done to expose the neck of the sac to avoid a vascular injury and the sac was excised. An appendicectomy was done before placing a large bowel in the left hypochondrium.

Conclusion: With a high degree of suspicion and early radiological evaluation, we were able to clinch the diagnosis in the early stage. Prompt surgical intervention prevented the high morbidity and mortality associated with PDH in our patient.

Clinical significance: PDH remains an elusive diagnosis. A high degree of suspicion with early radiological evaluation is required for diagnosis. Prompt surgical intervention can prevent catastrophic outcomes associated with this condition.

Keywords: Internal hernias, Paraduodenal hernias, Right paraduodenal hernia.

Journal of Medical Academics (2019); 10.5005/jp-journals-10070-0033

BACKGROUND

Internal abdominal hernia is the protrusion of a part of viscus through an opening in the peritoneal or mesenteric fold. They account for nearly 0.9% of all intestinal obstructions. Paraduodenal hernia (PDH) constitutes nearly 50% of all internal hernias, with left PDH being more common (3 times) than right PDH.¹

Patients were often present with nonspecific abdominal symptoms (i.e. abdominal pain, nausea or vomiting, and abdominal distension); however, if missed, PDH can lead to catastrophic outcomes in the form of acute small bowel obstruction, ischemia, and bowel perforation.²

Evaluation involves imaging in the form of USG and CECT abdomen; however, diagnosis is often evident only during surgery. The treatment approach for PDH is either open or laparoscopic and based on the principle of hernia reduction, with either repair of the defect or widening of the hernial orifice and excision of sac.³

We report an interesting case of right PDH presenting with intestinal obstruction that was a clinical conundrum owing to its sheer rarity. The clinical presentation, evaluation of the patient, and management are discussed along with relevant works of literature.

CASE DESCRIPTION

A 38-year-old gentleman with no known comorbidities and an insignificant past medicosurgical history was presented to the emergency department with an acute onset and intermittent colicky pain in the abdomen in the right lower quadrant of 1-day duration with two episodes of nonbilious vomiting and mild abdominal distension. On examination, fullness in the right lumbar and iliac fossa region was noted. Mild tenderness was present in the right lower quadrant. An ill-defined lump was noted in the right lower quadrant. Bowel sounds were increased. His hematological

^{1,2}Department of General Surgery, Army College of Medical Sciences, New Delhi, India

Corresponding Author: Prashant K Singh, Department of General Surgery, Army College of Medical Sciences, New Delhi, India, Phone: +91 8800308449, e-mail: pks.reg@gmail.com

How to cite this article: Singh PK, Shankar MMR. Right Paraduodenal Hernia: A Rare but Elusive Diagnosis. *J Med Acad* 2019;2(1):27–29.

Source of support: Nil

Conflict of interest: None

and biochemical parameters were within normal limits. Sonography of the abdomen was inconclusive. A contrast-enhanced CT scan of abdomen was done, which showed clustering of small bowel loops on the right side of the abdominal cavity with bowel loops lying behind superior mesenteric vessels (SMA and SMV), which was suggestive of right paraduodenal hernia (Fig. 1)

The patient was immediately taken up for an emergency laparotomy. The peritoneal cavity was approached through a midline incision. Intraoperatively, there was a thin hernial sac covering the small bowel (Fig. 2), which was herniating below the third part of duodenum (D3) and was clumped in right iliac fossa. Superior mesenteric vessels with ilioocolic and right colic branches were found at the neck of the sac.

A full Catell-Brasch maneuver was done to expose the neck of the sac to avoid a vascular injury and the sac was excised. Bowel loops were found to be healthy and no interloop adhesions were present. The hernia was reduced and the defect was closed with nonabsorbable sutures. An appendicectomy was done and large bowel was placed in the left hypochondrium, and anterior abdominal wall was closed in layers.

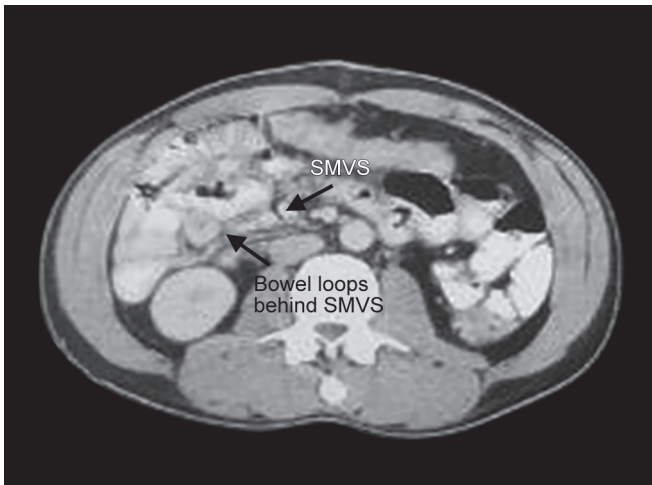
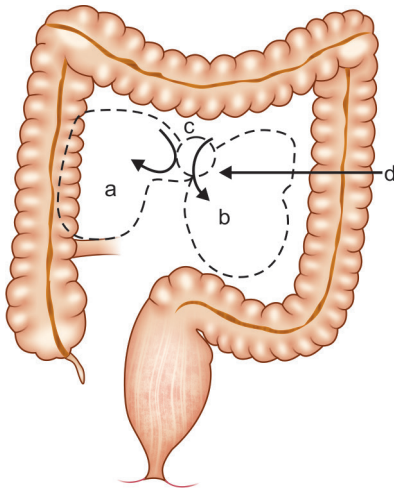


Fig. 1: CECT abdomen of patient showing small bowel loops lying behind superior mesenteric vessels



Figs 3A to D: A line diagram depicting the anatomical positions of the colon and fossae formed by a fusion of the peritoneal and mesenteric folds: (A) The fossa of Waldeyer, where the right PDH occurs; (B) The fossa of Landzert, where the left PDH occurs; (C) The retroduodenum, from where the hernia occurs; (D) The hernial orifice⁵

DISCUSSION

Paraduodenal hernia is the most common internal abdominal hernia¹ and is formed as a result of herniation of the small intestine through various fossa, which are formed by fusion of peritoneal and mesenteric folds (Fig. 3).⁵ Neubauer in 1786 gave the first description of PDH. He ascribed it to faults in peritoneal development. Over the years, several theories on development of PDH were formulated:

Moynihn's Theory

PDH is attributed to "physiological adhesions," which arise at the time of return of the bowel back to the abdomen and fusion of the common dorsal mesentery with the posterior abdominal wall. This leads to the formation of fusion folds and fossae. Two most important fossae implicated are the fossa of Landzert (on the left) and fossa of Waldeyer (on the right). Gradual enlargement of such fossae often leads to the development of PDH.⁴

Andrews' Theory

Andrews doubted the gradual enlargement of the fossae. He ascribed the condition to the developmental fusion defects of

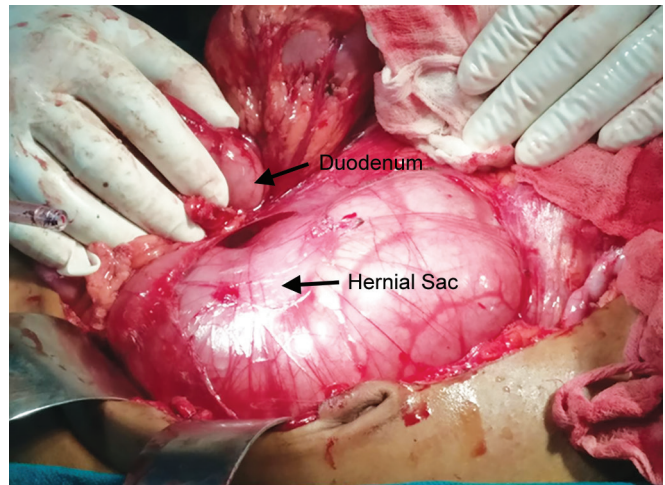


Fig. 2: Intraoperative photograph showing thin hernial sac covering small bowel loops (larger arrow) which is herniating behind the third part of duodenum (small arrow)

the peritoneum, which incarcerated the small bowel beneath the developing colon.⁶

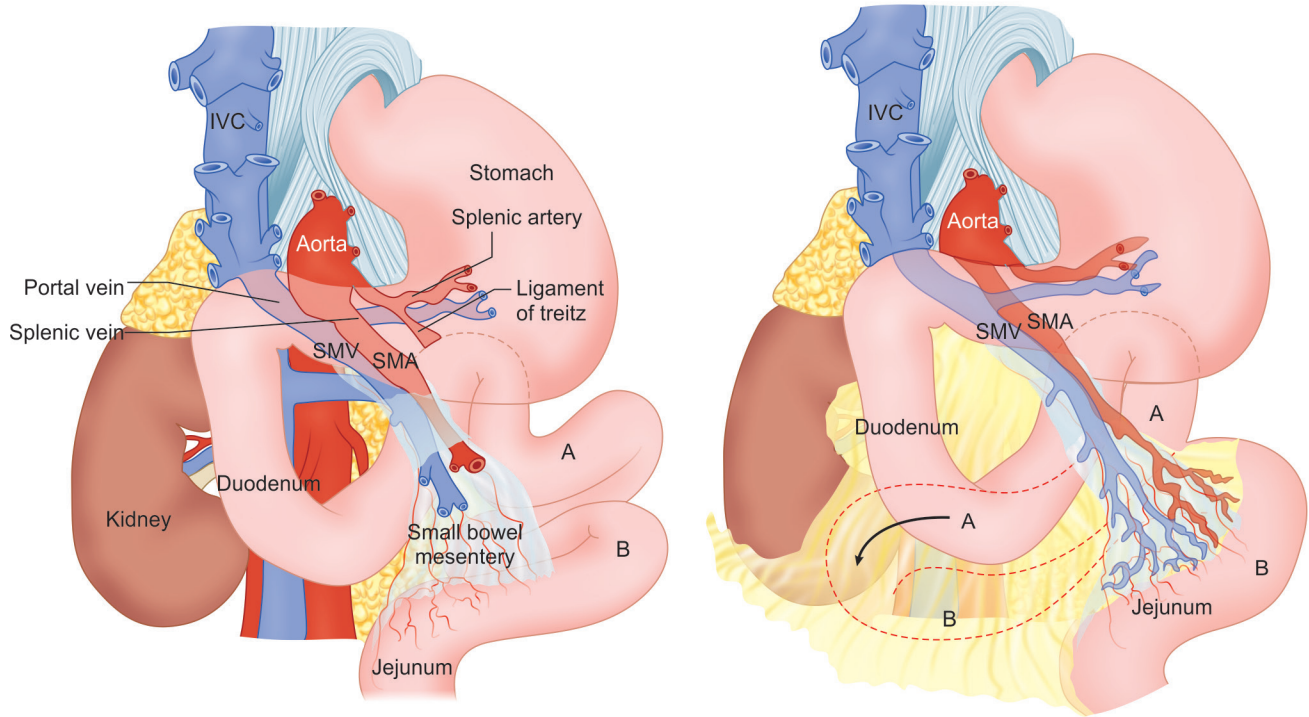
Intestinal maturation starts in the 6-weeks-old fetus when the midgut herniates into the umbilical cord. The midgut rotates a full 270° counterclockwise around the superior mesenteric artery by the time it re-enters the abdomen. If the prearterial segment rotates but the postarterial segment fails to rotate, the small bowel is entrapped in the right mesocolon, and right paraduodenal hernia results. The fossa of Waldeyer extends inferior to the third and fourth part opening being just inferior to the duodenojejunal junction and bound anteriorly by the inferior mesenteric vein and the ascending left colic artery (Figs 4 and 5).⁷

Handling patients presenting with a history of recurrent pain in the abdomen and ill-defined complaints often leads to misdiagnosis; a history of partial or complete intestinal obstruction might also be present. However, small bowel contrast radiography/CECT abdomen is the lynchpin of a preoperative diagnosis.⁸ PDH has unique characteristics under radiography, which is described as "total absence of small intestine in the true pelvis in the upright position; the small bowel is confined in a smooth, sharply circumscribed mass"—the "classical empty abdominal sign."⁹

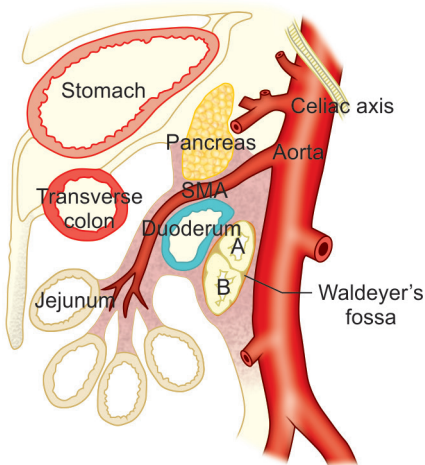
Superior mesenteric vessels lie in close proximity to the hernial orifice; therefore, the sac should not be opened at the hernial orifice. Two principle approaches have been recommended. In the first, after identifying the duodenum and protecting superior mesenteric vessels, the sac is opened wide laterally. Once the sac wall is excised, the pouch effect towards the pelvis vanishes, and the anatomical location of the bowel is maintained. The second approach is division of the lateral attachments of the right colon and mobilizing it to the left, opening the hernia sac wide and replacing the intestine in the normal position.¹⁰ Surgical widening of the hernial orifice and resection of the strangulated bowel, if any, with primary anastomosis can also be done.¹⁰ These approaches can also be tried laparoscopically.

CONCLUSION

With a high degree of suspicion and early radiological evaluation, we were able to clinch the diagnosis for our patient in early stage of disease and a prompt surgical intervention prevented the high morbidity and mortality associated with PDH in our patient. Following the surgery, the patient is well and on regular followup.



Figs 4A and B: (A) The illustration of normal adult anatomy shows (A) proximal and (B) distal segments of the jejunum relative to the superior mesenteric artery (SMA) and vein (SMV). (B) Representation of a right paraduodenal hernia demonstrates (A) proximal and (B) distal segments of jejunum posterior and to the right of the SMA and SMV⁷



Figs 5A and B: The depiction illustrates a patent Waldeyer's fossa in the root of the small bowel mesentery complete with herniated (A) proximal and (B) distal segments of the jejunum⁷

CLINICAL SIGNIFICANCE

PDH remains an elusive diagnosis. A high degree of suspicion with early radiological evaluation is required for early diagnosis. A prompt surgical intervention can prevent catastrophic outcomes (i.e. acute small bowel obstruction, ischemia, and bowel perforation) associated with this condition.

ACKNOWLEDGMENTS

The authors acknowledge our lab, radiology and OT, and anesthesia staff at BHDC for helping us in timely diagnosis and management of this case.

REFERENCES

1. Khan MA, Lo AY, Vande Maele DM. Paraduodenal hernia. *Am Surg* 1998; 64:1218–1222.
2. Moran JM, Salas J, Sanjuan S, et al. Paramesocolic hernias: consequences of delayed diagnosis. Report of three new cases. *J Pediatr Surg* 2004;39:112–116. DOI: 10.1016/j.jpedsurg.2003.09.027.
3. Brigham RA. Paraduodenal hernia. In: Nyhus LM, Condon RE. ed. *Hernia*, 4th ed., Philadelphia: Lippincott Williams and Wilkins; 1995.
4. Moynihan GBA. *On retroperitoneal hernia*. New York: William Wood and Co; 1906.
5. Mehra R, Pujahari AK. Right paraduodenal hernia: report of two cases and review of literature. *Gastroenterol Rep* 2016;4(2):167–171. DOI: 10.1093/gastro/gou076.
6. Andrews E. Duodenal Hernia: a misnomer. *Surg Gynecol Obstet* 1923;37:740.
7. Bittner JG, Edwards MA, Harrison SJ, et al. Laparoscopic Repair of a Right Paraduodenal Hernia. *JLS* 2009;13:242–249.
8. Brigham RA, Fallon WF, Saunders JR, et al. Paraduodenal hernia: diagnosis and surgical management. *Surgery* 1984;96:498–502.
9. Nobuyuki T, Takehiko G, Yoshimitsu O, et al. CT of internal hernias. *Radio Graphics* 2005;25:997–1015.
10. Bartlett MK, Wang C, Williams WH. The surgical management of paraduodenal hernia. *Ann Surg* 1968;168:249–254. DOI: 10.1097/0000658-196808000-00010.