



Case report

An incarcerated paraduodenal hernia of a malrotated gut in a 26-year-old man

Morteza Tavasolizadeh^{*}, Amin Dalili

Surgical Oncology Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran
 Department of General Surgery, Imam Reza Hospital, Mashhad University of Medical Sciences, Mashhad, Iran

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ABSTRACT

Introduction and importance: Paraduodenal hernias (PDHs) are congenital internal hernias. Overall, internal hernias are between 0.2 % and 0.9 %, while 53 % of these statistics are for PDH. There are left and right types of PDHs.

Case presentation: An otherwise healthy 26-year-old man was presented with a sudden-onset epigastric and right upper quadrant abdominal pain. Abdominopelvic double contrasted CT scan revealed multiple dilated proximal-mid small bowel loops in the portal venous phase consistent with small bowel obstruction, suggesting concomitant bowel malrotation with internal paraduodenal hernia. The patient with the pre-operative diagnosis of small bowel obstruction due to volvulus was scheduled for emergency surgery. He was four weeks complication-free in his regular follow-up.

Clinical discussion: In 1857, Treitz first described PDH as a phenomenon when the primitive midgut in embryonic life abnormally rotates and causes mesocolic hernia. The location of the duodenal recess is the origin point for describing the hernia; thus, the jejunum is the most common herniating viscus. However, the stomach, small intestine, and sometimes the colon usually consist of the contents of the hernia.

Conclusion: In the absence of surgical history, abdominal wall hernia, and intra-abdominal inflammatory disease, in case of repeated abdominal pain or intestinal obstruction, and if no other causes are found, the possibility of a PDH should be kept in mind.

1. Introduction

Paraduodenal hernias (PDHs) are counted as congenital internal hernias. Their incidence is still unclear since some patients remain asymptomatic throughout their lives. The data extracted from the autopsy results represent that the incidence of internal hernias is between 0.2 % and 0.9 %, while PDH has an approximately 53 % share of internal hernias [1–3]. According to entirely different embryological and anatomical features, PDH can be divided into left and right types [4]. We have reported a case of an incarcerated right-sided paraduodenal hernia of a malrotated gut in a 26-year-old man who was successfully treated surgically. This work conforms to SCARE 2023 criteria [5].

2. Case presentation

A 26-year-old man without any past medical surgical history was presented with a sudden-onset epigastric and right upper quadrant

abdominal pain that was non-radiating but worsened with deep inspiration over 24 h. His symptoms were associated with anorexia, nausea, and episodes of bilious vomiting. He also had experiences of similar but subtle pains after consuming food since 1.5 months ago. On physical examination, he was unwell but was afebrile and had typical vital signs. The abdomen was distended and rigid, with involuntary guarding focused on the right upper quadrant and epigastrium. A nasogastric tube was placed, and 200 ml of bile-stained fluid was drained over 3 h on free drainage. Relevant investigations included leucocytosis ($8.3 \times 10^3/L$), neutrophilia (81.4 %), elevated C reactive protein (7.1 mg/L), and normal serum lactate (1.0 mmol/L). A double-contrast abdominopelvic CT scan of the patient revealed multiple dilated proximal-mid small bowel loops in the portal venous phase consistent with small bowel obstruction. The cluster of the small intestine is seen in the lower part of the third part of the duodenum. Duodenum does not cross the midline [Fig. 1].

The duodenojejunal flexure was also seen on the right- side of the

^{*} Corresponding author at: Surgical Oncology Research Center, Imam Reza Hospital, Mashhad, P.O.: 9133913716, Iran.

E-mail addresses: Drmorteza20@yahoo.com (M. Tavasolizadeh), daliliam@mums.ac.ir (A. Dalili).

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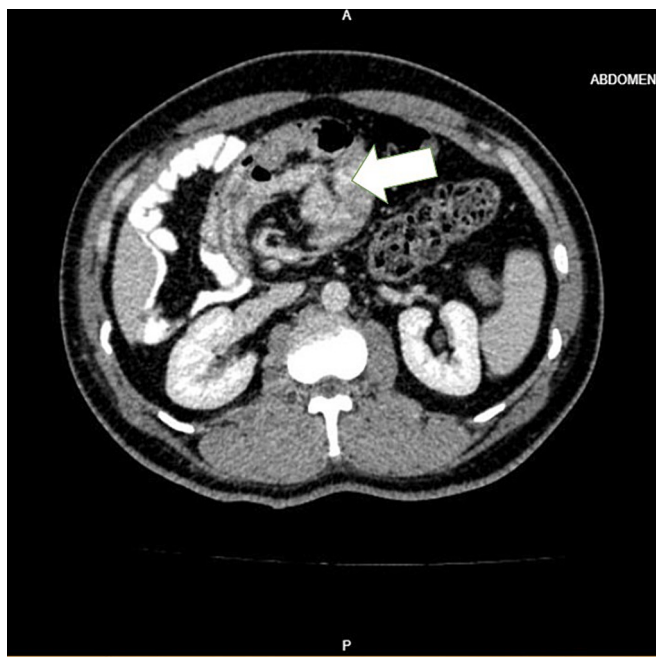


Fig. 1. Double contrast axial CT scan of the patient revealing multiple dilated proximal-mid small bowel loops in small bowel obstruction. The cluster of the small intestine is seen in the lower part of the third part of the duodenum (arrow). The duodenum has yet to cross the midline.

abdomen, suggesting concomitant bowel malrotation with internal paraduodenal hernia [Fig. 2]. The patient with the pre-operative diagnosis of small bowel obstruction due to volvulus was scheduled for emergency surgery. After midline laparotomy, the surgical team confronted several adherent bundles between the small intestine and the abdominal wall, which were released with electrocautery [Fig. 3]. The proximal jejunum was seen to enter a hernia sac formed by an aberrant duodenojejunal flexure located to the right of the aorta [Fig. 4]. This was presumed to be an incarcerated right-sided internal hernia of the paraduodenal recess in a malrotated gut. The hernia's neck was widened, and the sac was obliterated to allow the reduction of the contents. After releasing the internal hernia, the Ladd's procedure was performed, the adhesive bundles between the duodenum and the ileum were released, and finally, the SMA was released. The procedures mentioned above were also done on the bundles on the mesorectum; the cecum and the duodenum were placed in the LLQ and RLQ, respectively. After hernia reduction and giving time to the incarcerated segment, the mentioned part turned pink, and thus, there was no need for resection and anastomosis. The appendectomy was also performed for the patient. Since there was no resection and anastomosis, the oral feeding was initiated after 24 h. The patient was discharged on the third postoperative day.

He was followed up in the outpatient department in 4 weeks with no further complications.

3. Discussion

PDH occurs when the primitive midgut in embryonic life abnormally rotates and causes mesocolic hernia. Treitz initially described this phenomenon in 1857 [6]. Later, in 1889, by Jönnesco, para duodenal hernias were categorized as either left- or right-sided based on their location about the ligament of Treitz [7]. PDHs often occur in the 5th to seventh decades of life and have a higher incidence among men than women [3]. The most common complaints that patients with PDH have are abdominal pain and distention, and some also experience dyspepsia. As for the location of the duodenal recess, the jejunum is the most common herniating viscus [8]. However, the stomach, small intestine, and



Fig. 2. Coronal view of the CT scan.

sometimes the colon usually contain the hernia's contents [9,10]. There are few documented cases of PDHs associated with concomitant gut malrotation. During the embryologic period, the mid-gut undergoes a 270° counterclockwise rotation around an axis formed by the superior mesenteric artery, and finally at the 10th week, the prearterial jejunum comes to lie in the left upper quadrant while the postarterial segment lies in the right lower abdominal quadrant.

Right-sided para duodenal fossa variations are presumed to arise in weeks 8 to 10 of gestation due to incomplete rotation of the arterial jejunum in the mid-gut. In contrast, the post-arterial segment develops and usually rotates. CT scan is considered a proper modality in diagnosing the process mentioned above. Contrast-enhanced CT can be used to determine the sufficiency of the blood supply of the small intestine. According to the available data extracted from the literature, there are five imaging features of large PDHs as follows [8]: (1) an encapsulated cluster of small bowel in the left upper quadrant with the mesenteric vessels' occlusion, (2) small bowel loops posterior to the pancreas or transverse colon or stomach, (3) anterior displacement of the inferior mesenteric vein, (4) small bowel loops between the stomach and pancreas, and (5) convergence of mesenteric vessels toward the neck of the hernia near the ligament of Treitz. Surgery has three goals: repairing the defect of the hernia sac to achieve a typical anatomical structure, closing or reducing the hernia sac, and excising it. The neck of the hernia sac is closely associated with the sub-mesenteric vessels and the left colonic artery; thus, injury to the mentioned structures should be



Fig. 3. Internal hernia neck with adhesive bands.

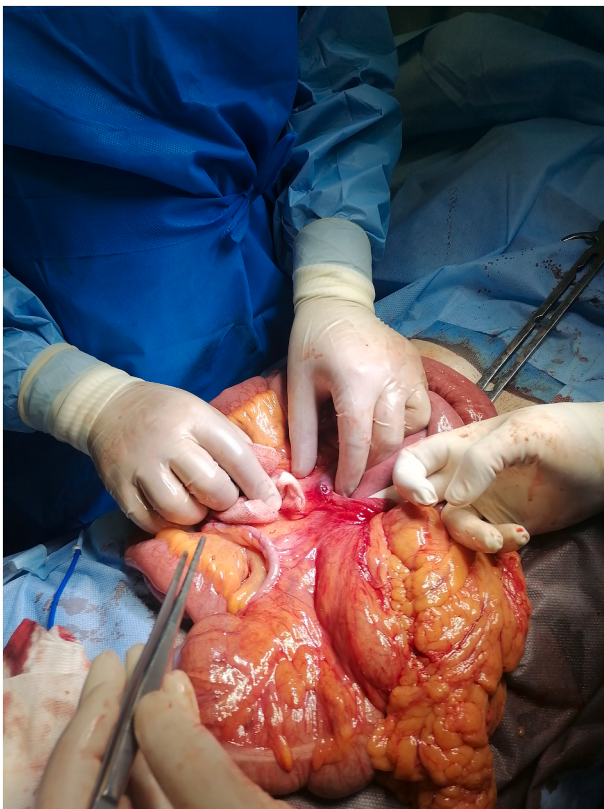


Fig. 4. Releasing adhesive bands.

avoided during the repairing process [11,12]. However, the integrity of the collateral vessels must be preserved to ensure an excellent intestinal blood supply [13].

4. Conclusion

Although rare and out of mind, in the absence of a history of surgery, abdominal wall hernia, and intra-abdominal inflammatory disease, in case of repeated abdominal pain or intestinal obstruction and if no other causes are found, the possibility of a PDH should be considered, especially when the inferior mesenteric vein moves forward.

Consent

Written informed consent was obtained from the patient in the second page of hospital document for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request. This issue has been raised and approved in the ethics committee of Mashhad University of Medical Sciences.

Ethical approval

This work has been presented and approved in the ethics committee of Mashhad University of Medical Sciences.

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Author contribution

Morteza Tavasolizadeh M.D. was the general surgeon who diagnosed, managed, and operated on the patient and in the role of supervision.

Amin Dalili M.D. prepared the manuscript in the form of case report and review of literature.

Guarantor

Morteza Tavasolizadeh.

Conflict of interest statement

The authors declare that there are no conflicts of interest preparing this manuscript and accept any responsibilities.

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