CASE REPORT

Case of a strangulated right paraduodenal fossa hernia in a malrotated gut

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SUMMARY

We report an unusual case of a strangulated internal hernia resulting from a right paraduodenal fossa hernia (PDH) in the context of bowel malrotation. There are few documented cases of PDHs associated with a concomitant gut malrotation. Emergency laparotomy was performed based on clinical and radiological. Intraoperatively, the proximal jejunum was seen to enter a hernia sac formed by an aberrant duodenojejunal flexure located to the right of the aorta. This was presumed to be a strangulated internal hernia of the paraduodenal recess in a malrotated gut. The hernia neck was widened and the sac obliterated to allow reduction of the contents. On reduction and warming, the insulated small bowel appeared viable and returned to the abdominal cavity without resection.

BACKGROUND

Right-sided paraduodenal fossa hernias are rare, however, are an important cause of intestinal obstruction with a mortality rate reported as high as 50%, and thus could be encountered by any surgeon and worth highlighting to the *BMJ* case reports readership and greater surgical community.

CASE PRESENTATION

An otherwise well 53-year-old woman with a history of laparoscopic cholecystectomy presented with sudden-onset epigastric and right upper quadrant abdominal pain that was non-radiating and worse with deep inspiration. This was associated with nausea and bilious vomiting unrelated to meals, subjective fevers and anorexia over 24 hours. She reported a 2-day history of constipation and tenesmus without per-rectal bleeding. Clinically, she appeared unwell with normal vital signs and was afebrile. Her abdomen was distended with rigidity and involuntary guarding in the right upper quadrant and epigastrium. A nasogastric tube was placed and drained 350 mL of bile-stained fluid over 3 hours on free drainage. Relevant investigations included leucocytosis ($0.011 \times 10^9/L$), neutrophilia ($10.22 \times 10^6/L$), elevated C reactive protein (7.1 mg/L) and normal serum lactate (1.0 mmol/L).

INVESTIGATIONS

CT imaging of her abdomen and pelvis with intravenous contrast in the portal venous phase (Phillips Brilliance 64-slice CT Scanner) showed multiple dilated proximal-mid small bowel loops consistent with small bowel obstruction. Located in the

right retroperitoneal space was a cluster of dilated, non-enhancing small bowel loops within a sac of fluid which appeared to be exerting a mass effect on adjacent small bowel (figure 1). This appeared to be a closed-loop bowel obstruction suggestive of an internal hernia with the hernia neck clearly visible on CT (figure 2). The duodenojejunal flexure was also seen on the right-hand side of the abdomen, suggesting a concomitant bowel malrotation (figure 3).

DIFFERENTIAL DIAGNOSIS

Small bowel obstruction.

Volvulus.

TREATMENT

Emergency laparotomy was performed based on clinical findings of acute abdomen and CT suspicion of intestinal ischaemia. Proximal jejunum was seen to enter a hernia sac formed by an aberrant duodenojejunal flexure located to the right of the aorta. This was presumed to be a strangulated internal hernia of the paraduodenal recess in a malrotated gut. The hernia neck was widened and the sac obliterated to allow reduction of the contents. On reduction and

Figure 1 Axial view of CT imaging with intravenous contrast acquired in the arterial phase demonstrating SB contained within an internal sac on the right side of the abdomen. SB within sac is poorly enhancing with localised oedema. SB, small bowel.

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Figure 2 Coronal view CT imaging with intravenous contrast acquired in the portal venous phase demonstrating the neck of the hernia sac (N) and resulting closed-loop obstruction of the small intestine (SB). Other identifiable features include dilated proximal SB, perihepatic and lower abdominal free fluid and nasogastric tube located in the stomach. N, neck; SB, small bowel.

warming, the insulted small bowel appeared viable and returned to the abdominal cavity without resection.

OUTCOME AND FOLLOW-UP

Following an uncomplicated postoperative recovery, the patient was discharged on the third postoperative day. The patient was followed up in the outpatient department in 4 weeks with no further complications.

Figure 3 Sagittal view of CT imaging with intravenous contrast acquired in the arterial phase demonstrating the absence of the duodenum crossing the abdominal aorta (A) inferior to the root of the superior mesenteric artery. The absence of the duodenum to the left of the abdomen suggests a bowel malrotation, resulting in the duodenojejunal flexure located on the right side. Dilated proximal and collapsed distal SB, as well as free pelvic fluid, are also seen. SB, small bowel.

Learning points

- ▶ Paraduodenal fossa hernias are rare and difficult to diagnose given a low index of suspicion.
- ▶ They carry with them a high mortality rate.
- ▶ Management should consider prevention of future hernias. It is important for the patient to be investigated thoroughly to expedite diagnosis and treatment.

DISCUSSION

We report an unusual case of intestinal obstruction resulting from a right paraduodenal fossa hernia (PDH) in the context of bowel malrotation. There are few documented cases of PDHs associated with a concomitant gut malrotation.^{1–3} A disease spectrum often complicates diagnosis, with some reports of incidental discovery during elective abdominal surgery or on postmortem dissection, while others report mortality to be as high as 50%.⁴

Embryologically, the mid-gut undergoes a 270° counterclockwise rotation around an axis formed by the superior mesenteric artery (SMA)—a branch of the descending aorta. At the conclusion of rotation at week 10, the prearterial jejunum comes to lie in the left upper quadrant while the postarterial segment lies in the right lower quadrant. Right-sided paraduodenal fossa variations are presumed to arise in weeks 8 to 10 of gestation due to incomplete rotation of the prearterial jejunum in the mid-gut, while the postarterial segment develops and rotates normally.³ Consequently, both segments are localised to the right of the SMA. The mesentery behind the SMA and inferior to the third portion of the duodenum also fails to fuse resulting in a defect known as Waldeyer's fossa.³

Acutely, surgery serves to reduce and prevention of future hernias.⁵ Some reported cases advocate repairing the defect between the mesentery of the ascending colon and the parietal peritoneum with non-absorbable sutures.⁵ In contrast, the hernia sac can be widened and the bowel contents reduced, as performed in this case.¹ While laparoscopic repair has been described, surgical approach is largely decided based on the clinical scenario and surgeon experience.^{3,6} Bowel resection may be required if irreversible ischaemia or necrosis is present, which could have further complicated this scenario given the proximity to the pancreaticoduodenal structures.⁷

Contributors MO: data collection. MR: manuscript production. MP: manuscript production/revisions. CP: supervision, manuscript revisions.

Competing interests None declared.

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