Left paraduodenal hernia: an unusual cause of small-bowel obstruction

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Paraduodenal hernias, 50% of which cause bowel obstruction, are difficult to diagnose. Successful repair depends on a careful appreciation of the anatomy of paraduodenal recesses and appropriate places to incise the peritoneum to permit reduction of the herniated contents. We describe the radiologic aspects and intraoperative features of a congenital paraduodenal hernia in a young adult.

Case report

A 35-year-old man presented with a 10-day history of recurrent crampy abdominal pain, distension, nausea, vomiting and alternating constipation and diarrhea. His medical history was significant for an appendectomy, done many years earlier. Physical examination revealed dehydration and some abdominal distension but no visible external hernia. Small-bowel follow-through with barium and intraoperative images (Fig. 1) showed barium exiting slowly from the stomach (Fig. 1A) then filling a sac-like "cocoon" structure (Fig. 1B). The barium did not exit from the encysted bowel until 3 hours later (Fig. 1C), and finally reached the colon after 4 hours (Fig. 1D). At laparotomy, the distended small bowel was visible through the gastrocolic omentum (Fig. 1E). During reduction the collapsed distal and distended proximal small bowel was seen to pass through a defect in the transverse mesocolon (Fig. 1F). The small bowel was reduced back into the infracolic compartment where it was found to be viable, and the hernial sac was excised. The peritoneal defect was closed with interrupted nonabsorbable sutures. The jejunum at the ligament of Treitz was affixed to the posterior parietal peritoneum to prevent it from sliding superiorly. The patient's postoperative recovery was uncomplicated, but months later a small-bowel obstruction necessitated a second laparotomy for lysis of multiple adhesions. At that time, the hernial defect was well sealed.

Discussion

Internal hernias, which account for 0.6% to 5.8% of small-bowel obstructions, can be congenital or acquired.[1] Acquired internal hernias usually result from failure to close a mesenteric defect after bowel resection. Congenital internal hernias may be summarized as paraduodenal (53%), transmesenteric (12%), at the foramen of Winslow (8%), paracecal (6%) and transomental (<5%).[1]

Paraduodenal hernias, although rare in clinical practice, are the commonest congenital internal hernias, with over 400 cases having been reported in the literature.[2] They account for 0.2% to 0.9% of small-bowel obstructions[2] and a death rate of around 20%. Males are affected 3 times more often than females.[3] The average age at the time of presentation is 38.5 years.[4] There are 2 types of paraduodenal hernias: left sided and right sided. The left-sided hernias are more common, representing 75% of cases.[2] They involve the paraduodenal fossa of Landzert, which is located lateral to the fourth segment of the duodenum and posterior to the inferior mesenteric vein and left colic artery.[3] This fossa of Landzert is a fold seen in 2% of autopsies.[2] Right-sided paraduodenal hernias make up 25% of cases and involve the mesentericoparietal fossa of Waldeyer, which is just lateral and inferior to the descending duodenum.[3] The superior mesenteric artery and ileocolic branches are situated in the inferior wall of the right paraduodenal hernia sac.[5] This fossa is an abnormal fold reported to be present in about 1% of autopsies.[2]

There are 2 theories about the etiology of paraduodenal hernias.[2] One is the mechanical theory, which states that increased intra-abdominal pressure forces loops of intestine into pouches where fusion has not been complete. The more accepted theory, proposed in 1923 by Andrews, suggested that hernias resulted from errors in midgut rotation during the 5th to 11th weeks of gestation with the loops of bowel becoming interposed between the attachment of the mesentery and the posterior abdominal wall.[2] More specifically, left paraduodenal hernias result from rotation of the midgut dorsally to the colic branches of the inferior mesenteric artery instead of ventrally, allowing invagination into the mesocolon.[3] Right paraduodenal hernias are formed

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by incomplete rotation of the midgut, which remains on the right side of the abdomen trapped in a sac, of which the anterior wall is the mesocolon.[3,6]

Paraduodenal hernias are quite difficult to diagnose. Presentation can range from acute intestinal obstruction (which is the most common clinical presentation) to a long history of vague abdominal pain, often relieved by changes in position,[2,3,7] to an incidental finding at laparotomy or autopsy.[1] Unfortunately, investigations, unless done at the time of acute obstruction, are often unhelpful because often the hernia has reduced itself; the sufferer is then labelled as having psychosomatic illness.[2] Plain radiographs may show a circumscribed, ovoid mass of multiple jejunal loops occupying the left upper quadrant immediately lateral to the ascending duodenum for a left paraduodenal hernia.[3] For a right paraduodenal hernia, there may be an ovoid grouping of several small-bowel loops just lateral and inferior to the descending duodenum.[3] Small-bowel follow-through radiographs can be useful (as in our patient), and small bowel may be seen herniated through the defect in the transverse mesocolon. If CT is done, for a left paraduodenal hernia, a focal cluster of small bowel may be seen abnormally positioned posterior to the stomach and to the left of the fourth portion of the duodenum.[7]

Once diagnosed, these hernias should be repaired because 50% of them cause obstruction.[1,2] Some key anatomical factors and manoeuvres will ensure success. The opening of a right-sided paraduodenal hernia is bound anteriorly by the superior mesenteric artery and vein or the ileocolic artery and vein.[2] It is bounded posteriorly by the posterior abdominal wall and superiorly by the duodenum.[2] Thus, the only place where there are no vital structures is the inferior edge, and this is the site where the incisions should be made.[2] The opening of a left-sided paraduodenal hernia is bounded anteriorly by the inferior mesenteric vein and left colic artery; it is bounded posteriorly by the posterior abdominal wall and superiorly by the duodenojejunal flexure, pancreas and renal vessels.[2] The safest place to incise is the inferior edge to widen the neck and allow reduction.[2] Once incising, the surgeon should plan for gentle manual reduction. For a right-sided paraduodenal hernia, the prearterial and postarterial segments of midgut must be repositioned to locations they would normally occupy at the end of the first stage of rotation. This is done by dividing the lateral attachment of the colon on the right side and transferring the en-

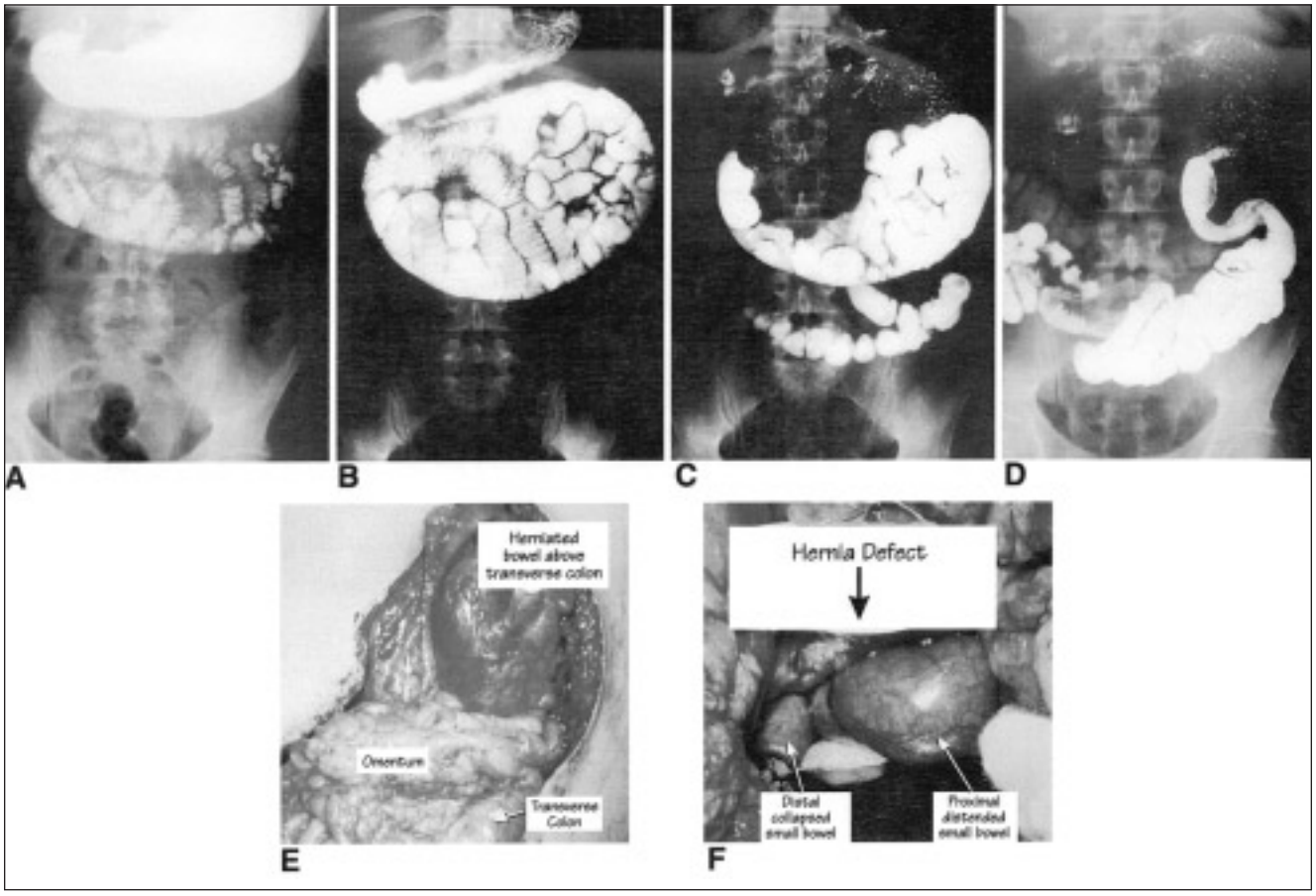

FIG. 1. Radiologic and corresponding intraoperative views of paraduodenal hernia containing small bowel. (A) Initial barium small bowel follow-through demonstrates the exit of barium from the stomach. (B) Barium enters the small bowel, which is encysted in the hernia. (C) The 3-hour view demonstrates exit of barium from the hernial sac. (D) At 4 hours barium enters the colon. (E) Intraoperative view demonstrates midline laparotomy with herniated small bowel visible through the gastrocolic omentum above the transverse colon. (F) Intraoperative view from the root of the transverse mesocolon reveals a rigid hernial defect through which a loop of distal (collapsed) small bowel is emerging, and the proximal (dilated) small bowel is being reduced back to the infracolic compartment.

tire midgut to the left side of the abdomen.[8] Laparoscopic repair of a paraduodenal hernia on the left side was reported in 1998.[9]

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SESAP Questions
Questions SESAP

Category 4, Items 34–38

(A) Distal splenorenal shunt
(B) Hepatic transplantation
(C) Portacaval shunt
(D) Sugiura–Futagawa procedure
(E) Transjugular intrahepatic portosystemic shunt (TIPS)

Item 34. Patient with portal hypertension and Child's C liver failure

Item 35. Patient with portal hypertension and massive ascites awaiting transplantation

Item 36. Acute Budd–Chiari syndrome

Item 37. Portal hypertension in patient with extrahepatic portal vein thrombosis and prior splenectomy

Item 38. Patient with multiple prior variceal hemorrhages complicated by encephalopathy

For the 5 items above select the one lettered phrase that is most closely associated with each one. For the critique of Items 34 to 38, see page 465.