

Stomach-Containing Paraumbilical Hernia with Obstruction

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Case Summary

An elderly patient presented to the emergency department with abdominal pain, nausea, and vomiting. The patient had a known, large ventral abdominal paraumbilical hernia that was diagnosed 1 month prior on CT (Figure 1). This initial CT showed a large hernia sac containing small and large bowel loops without signs of bowel obstruction or strangulation. 1 month later, she returned with worsened abdominal pain, nausea, and vomiting. A repeat abdominal and pelvis CT examination was performed. This showed interval herniation of the distal stomach and proximal bowel into the patient's known large paraumbilical hernia, with resultant gastric outlet obstruction. After receiving intravenous fluid and nasogastric tube placement, the patient underwent surgery. The operative report described a large, ventral abdominal hernia with viable stomach, proximal duodenum (D1), cecum, ascending and transverse colon, and multiple loops of small bowel. There was no evidence of strangulation. The patient successfully recovered after surgery.

Imaging Findings

Prior comparison of abdomen and pelvis CT with intravenous contrast (axial and sagittal reconstructed images) (Figure 1) showed a large paraumbilical hernia containing small and large bowel loops as well as the appendix. There was no evidence of bowel obstruction or strangulation. Repeat abdomen and pelvis CT with intravenous contrast (axial and sagittal images) obtained 1 month later (Figure 2) showed interval herniation of distal stomach and proximal duodenum (D1 segment) into the known large paraumbilical hernia with resultant gastric outlet obstruction. There was no evidence of strangulation. Serial axial images from cranial to caudal (Figure 3) again show interval herniation of distal stomach and the proximal duodenum into the large paraumbilical hernia.

Diagnosis

Stomach within paraumbilical hernia.
Differential diagnoses could include incisional hernia, epigastric hernia, rectus

abdominis diastasis, and abdominal wall neoplasm.

Discussion

Abdominal hernias are abnormal protrusions of peritoneal lined organs through the abdominal wall. They are commonly encountered and have an estimated prevalence of 25% in adults.¹ Although abdominal hernias can be asymptomatic, surgical treatment may be required due to the risk of complications such as incarceration and strangulation.^{1,2}

In this case report, we specifically focus on midline abdominal hernias, which include epigastric, paraumbilical, umbilical, and hypogastric hernia types. Among these types, umbilical/paraumbilical hernias are the most frequently encountered and account for about 13.9% of all hernias. They occur in and around the umbilicus as a result of a defect in the linea alba and/or abdominal rectus muscle diastasis.² Patients typically present with an abdominal bulge that can be asymptomatic or tender to palpation. Ventral abdominal hernia contents are typically a combination of peritoneal fat, omentum, and small bowel.³ Larger-sized ventral abdominal hernias may contain large bowel as well. Stomach herniation into a pre-existing ventral abdominal hernia, however, is rare and has only been described a few times in the past century.⁴⁻⁸

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Figure 1. Abdomen and pelvis CT with intravenous contrast at initial presentation. (A) Axial slice at the level of the hips demonstrating a large midline ventral abdominal wall hernia sac containing large and small bowel with associated mesentery. (B) Parasagittal slice demonstrating a large complex paraumbilical hernia with dominant wide-necked hernia sac containing large and small bowel without evidence of bowel obstruction or strangulation. No herniation of the stomach in the hernia sac.

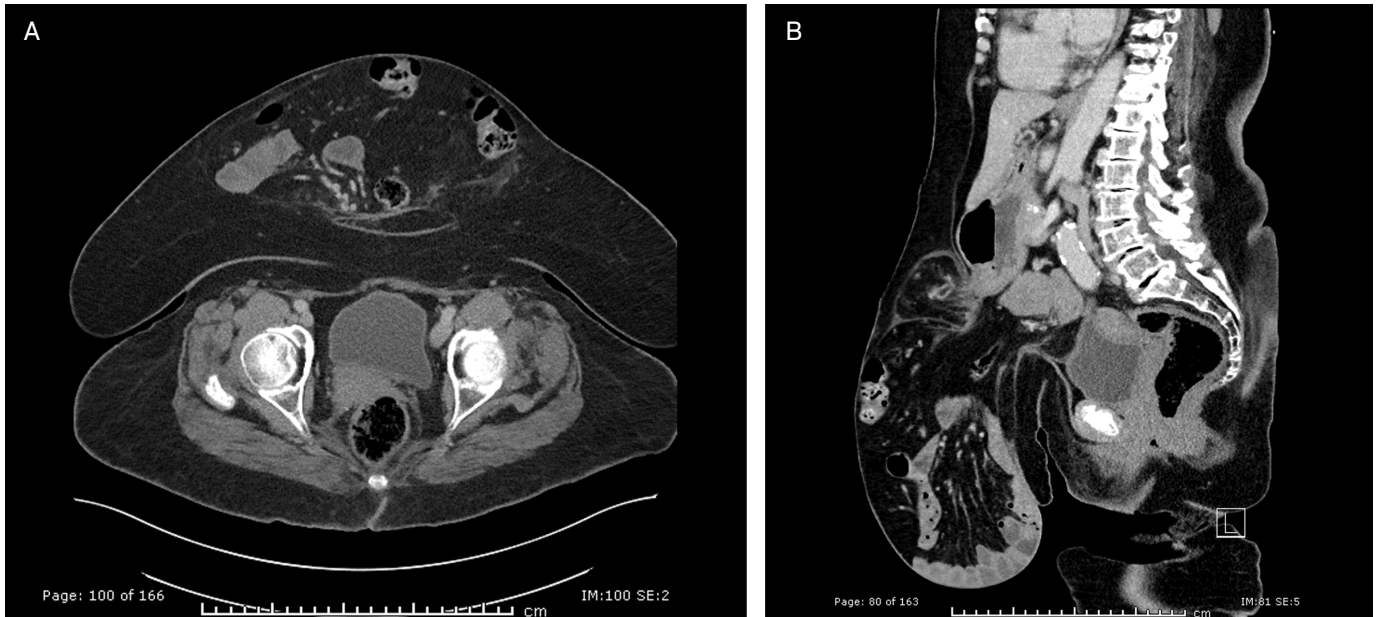


Figure 2. Abdomen and pelvis CT with intravenous contrast obtained 1 month later. (A) Axial slice showing interval herniation of the distal stomach into the sac along with previously seen colon and small bowel. (B) Parasagittal slice demonstrating a significantly distended stomach which narrows as it passes through the hernia neck. The proximal duodenum is also seen in the hernia sac (white arrow). There was no evidence of bowel strangulation. However, the patient had a resultant gastric outlet obstruction at this time, as evidenced by her fluid-distended stomach.

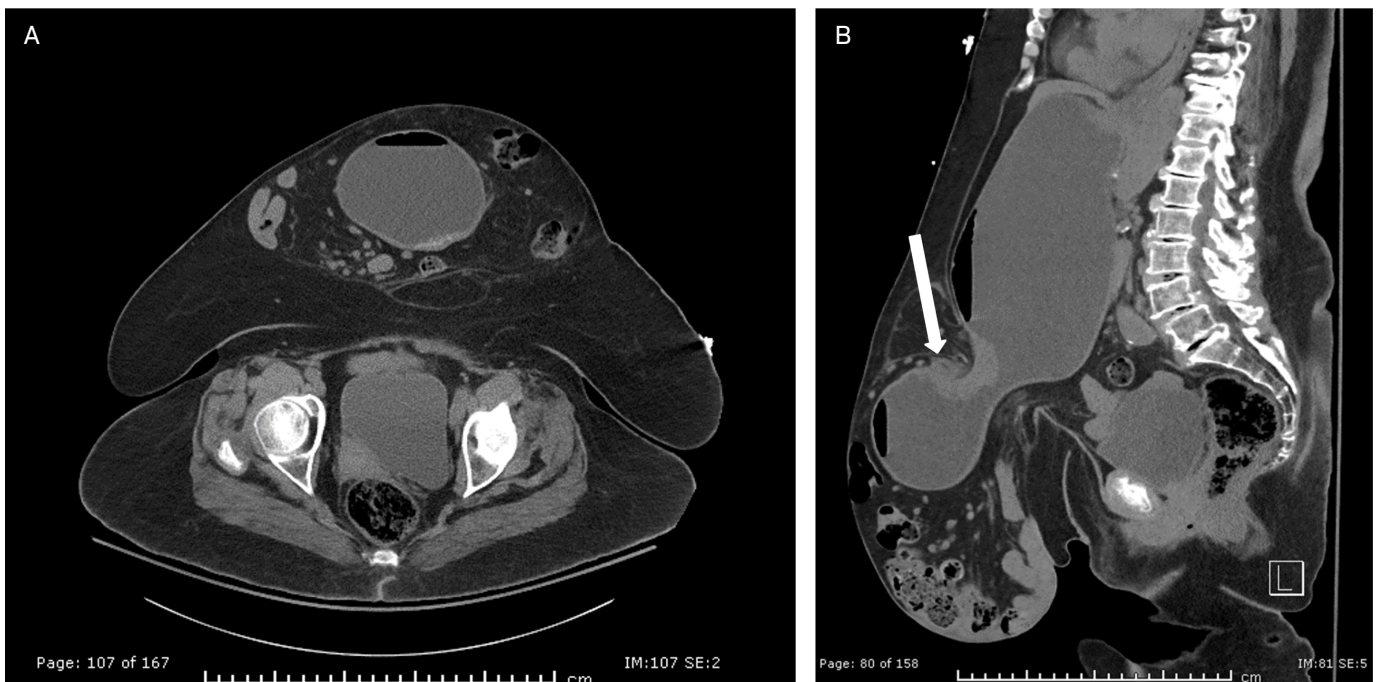
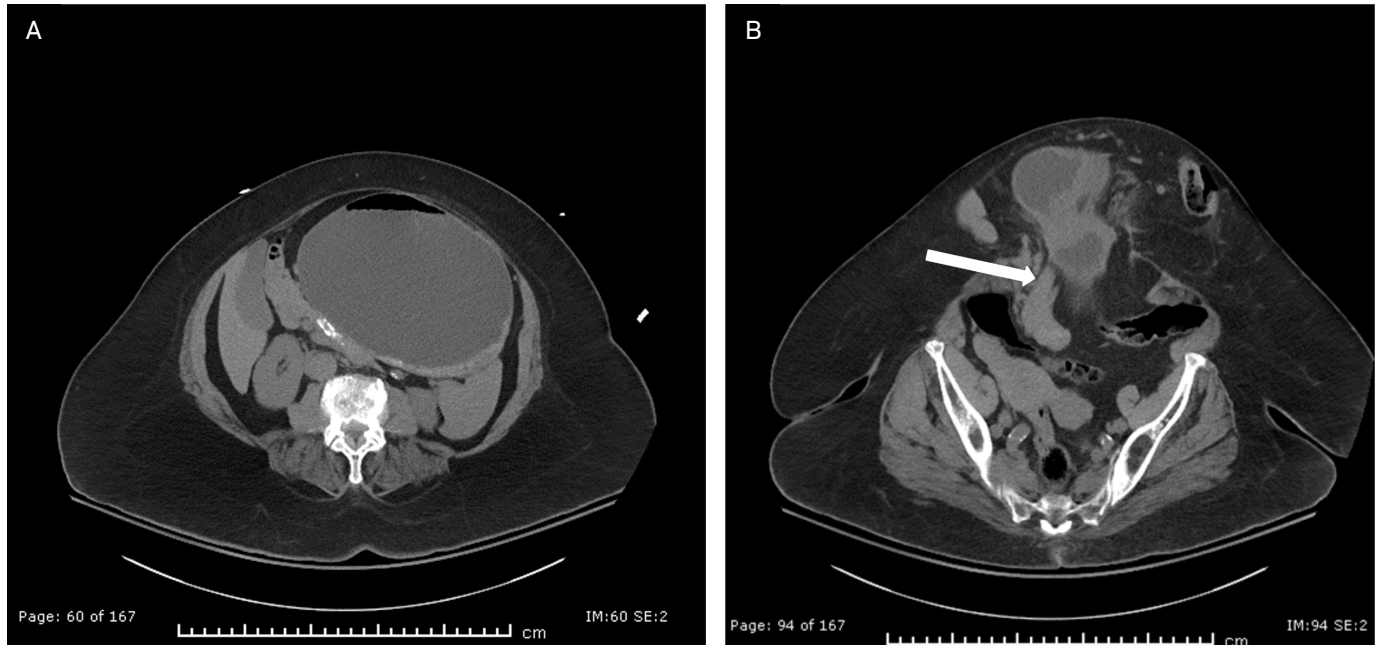


Figure 3. Additional contrast-enhanced abdomen and pelvis CT images acquired during the 1-month follow-up. (A) A more superior axial slice at the level of the kidneys demonstrating a fluid-distended stomach as a result of gastric outlet obstruction. (B) Axial slice at the level of the hernia neck showing herniation of the proximal duodenum (white arrow) and distal stomach with narrowing through the hernia neck.



Few similar previous case reports were found in a literature review. Thomas et al was the only other study to identify the stomach in a paraumbilical hernia on CT.⁸ In their study, a 91-year-old woman with a long-standing paraumbilical hernia presented with repeated vomiting and dehydration. Endoscopy showed external gastric compression, and CT revealed a hernia sac containing the distal stomach, pylorus, and proximal duodenum. Sampaio et al used a barium swallow to visualize herniation of the gastric antrum and duodenal bulb in a 59-year-old woman.⁷ Orr et al. used a similar technique to demonstrate stomach incarceration in a 49-year-old female with chronic vomiting.⁴ Bryk et al used barium swallow to show gastric outlet obstruction in a 63-year-old woman with large umbilical hernia.⁵ In another published case involving a 62-year-old woman, US demonstrated a herniated stomach appearing as a cystic mass with internal echoes protruding through the linea alba.⁶

The clinical findings in our case are consistent with those described in prior

reports. The most frequently observed symptom is vomiting, which carries a risk of dehydration and electrolyte disturbances. These hernias tend to occur in multiparous women in middle to later adulthood. Pregnancy is considered a risk factor due to the increased intra-abdominal pressure, which can stretch and weaken the abdominal wall muscles.^{8,9} Although the stomach is secured by multiple ligaments, these attachments may become increasingly lax with age.^{5,8} This laxity may contribute to the development of stomach herniation later in life, as seen in our patient.

The initial diagnosis of paraumbilical hernias is made clinically and can be assisted by plain radiography, barium studies, ultrasonography, or CT.^{2,9,10} Although previous cases have used barium studies and endoscopy, CT is currently the preferred imaging modality because it provides higher accuracy for identifying hernia contents and complications such as obstruction or incarceration.² US may also be useful because it allows real-time assessment of motion to identify

herniated organs. In our case, CT provided high anatomical resolution, enabling rapid identification of the hernia contents and assessment for bowel obstruction or strangulation.

Definitive treatment of paraumbilical/umbilical hernias typically requires surgical repair with sutures or mesh reinforcement.¹ Prophylactic surgical treatment is often recommended to prevent complications even in asymptomatic patients.⁹ Our patient successfully underwent ventral abdominal surgical repair and abdominoplasty with complex repair. A clinical implication from our case is that prompt surgical treatment at the initial encounter may have prevented her gastric herniation.

Conclusion

Gastric herniation into an existing paraumbilical/umbilical hernia is a rare complication. Patients may present with vomiting and gastric outlet obstruction. CT should be ordered to quickly identify

herniated content and other complications such as bowel obstruction, strangulation, and incarceration. Multiparous women in middle to late adulthood are at higher risk of stomach herniation due to weakened abdominal muscles from pregnancy and age-related laxity of stomach ligaments. Patients fitting this demographic should be educated about their risk of herniation and referred to surgical services for prophylactic surgical treatment.

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