ABSTRACT

Volvulus of the small bowel, although rare, carries a high risk of strangulation and ischemic necrosis. It is usually caused by the rotation of a loop of small intestine around an adhesion band or stoma. We present a case of an anterior gastropexy band, giving rise to a small bowel volvulus, necessitating resection due to infarction. This band resulted from separation of the most distal anterior gastropexy suture from the anterior abdominal wall. The distensible nature of the stomach and its resultant postprandial gain in weight produced tremendous shearing forces on the gastropexy sutures, and, as our case demonstrates, a greater number of gastropexy sutures does not protect against this complication.

Key Words: Volvulus, Small bowel, Anterior gastropexy, Laparoscopy.

CASE REPORT

A 54-year-old male patient presented as an emergency with severe epigastric and central abdominal pain of 20-hours duration. The pain was of sudden onset, starting with an episode of retching after a meal. It was spasmodic in nature and radiated to the lower chest. The patient had no history of vomiting but continued to retch. He had released his bowels the morning prior to admission.

The patient described the symptoms as very similar to those that had necessitated acute admission 2 years previously. Subsequent investigation revealed a large organo-axial gastric volvulus complicating a paraesophageal hernia. Preoperative pH manometry showed no evidence of reflux and a laparoscopic anterior gastropexy, comprising 7 nonabsorbable sutures placed between the fundus and greater curvature of the stomach and the anterior abdominal wall, was performed. The patient remained well until the current admission.

On examination, he was normotensive, afebrile, and showed no signs of distress, but was tachycardic with a pulse rate of 102 per minute. An abdominal examination revealed slight distension and marked tenderness across the upper abdomen with no signs of peritonism but normal bowel sounds. The white cell count was slightly raised at 14.5 x 10^9/l, but no other hematological or biochemical abnormalities were present.

A plain supine abdominal radiograph taken on admission showed normal caliber small and large bowels. A chest radiograph showed a large mediastinal defect, and the initial diagnosis was recurrent herniation and volvulus. However, a nasogastric tube passed with ease and only a few milliliters of bile-stained fluid was aspirated.

The patient's abdominal pain worsened over the next few hours with the development of guarding and rebound tenderness. A decision to operate was therefore made on clinical grounds. Midline laparotomy revealed a midileal volvulus around the most distal anterior gastropexy suture, which had stretched to form a band. The more proximal gastropexy sutures were intact and the stomach, gastroesophageal junction, colon, and spleen were within the abdomen. The band, incorporating a
knotted nonabsorbable suture, was divided. Approximately 35 centimeters of midileum involved in the volvulus had become necrotic and a segmental resection with primary stapled side to side ileo-ileal anastomosis was therefore performed. The patient was discharged on the seventh postoperative day and has remained well on follow-up.

**DISCUSSION**

Volvulus is the rotation of a loop of intestine about its mesenteric attachments that, if complete, may result in closed loop obstruction and ischemic necrosis. Primary volvulus results from malrotation of the gut or congenital excessive mobility from loose fixation or long mesenteric attachments (volvulus of the midgut in neonates, cecal or sigmoid volvulus in adults). The more common secondary volvulus is due to a rotation of a loop of small intestine around an adhesion band or stoma. In adults, 70% to 80% of cases involve the sigmoid colon and 10% to 20% involve the cecum. Small bowel volvulus, although rare, has been shown to carry a 61% risk of strangulation, compared with 28% in herniation. The clinical presentation may be that of an acute abdomen or chronic intermittent pain, although the symptoms of strangulated and non-strangulated cases are similar. Plain abdominal radiography may demonstrate small bowel dilatation or an absence of bowel gas but is frequently normal. Where small bowel obstruction is suspected and plain radiographs are normal, computed tomographic (CT) scan may be helpful in diagnosis and may also provide information about bowel ischemia or infarction.

In our patient, presentation with unproductive retching and severe epigastric pain (2 features of Borchardt’s triad of gastric volvulus) together with a past history of anterior gastropexy favored the diagnosis of recurrent gastric volvulus. This was further supported by the finding of a mediastinal defect on chest radiography. However, the third feature of Borchardt’s triad, inability to pass a nasogastric tube, was not present in our patient. Because of the patient’s deteriorating clinical condition, the decision was made to intervene rather than await further imaging.

Previous authors have debated the need to remove the hernia sac during surgery for paraesophageal hernia. Most favor excision of the sac to reduce the risk of recurrence and the formation of mediastinal serous cysts. This can, however, be technically challenging in the presence of adhesions and may result in iatrogenic visceral injury.

The sac had not been excised during anterior gastropexy in our patient, producing the mediastinal defect visible on plain chest radiography taken both before and after laparotomy.

Despite the obvious advantages of improved wound healing and earlier hospital discharge, reports have suggested an increase in both operative and postoperative complications after laparoscopic antireflux procedures. These include left pneumothorax, mesenteric thrombosis, and increased incidences of paraesophageal herniation, vagal nerve injury, and gastroesophageal perforation. The incidence of postoperative small bowel obstruction (mainly adhesive) after laparoscopic procedures is expected to be much lower than that after the equivalent open procedure. However, small bowel obstruction after laparoscopic antireflux surgery has been reported more frequently in pediatric patients, the incidence being much higher after Nissen fundoplication than with anterior gastropexy (5.5% vs 0.8%).

To our knowledge, this is the first reported case of an anterior gastropexy band giving rise to a small bowel volvulus. One previous report has been made of small bowel herniation occurring between the anterior gastropexy site and the falciform ligament. The herniated small bowel was reduced, and the hernial defect closed by suturing the greater curvature of the stomach anteriorly to the anterior abdominal wall and medially to the falciform. The authors recommend anchoring the stomach along the greater curvature at several points to obliterate potential sites for herniation.

In this case, a series of 7 nonabsorbable sutures anchored the fundus and greater curvature to the anterior abdominal wall, but the distal suture separated from the abdominal wall creating a band and subsequent small bowel volvulus. The distensible nature of the stomach and its resultant postprandial gain in weight produce tremendous shearing forces on the gastropexy sutures, and, as our patient demonstrates, a greater number of sutures does not protect against this complication. Generous tissue bites from the stomach and anterior abdominal wall, avoiding undue tension to prevent tissue ischemia, may provide better resistance against the gravitational force of a full stomach.

In conclusion, it cannot be overemphasized that prompt recognition of the need for operative intervention when clinically indicated remains the cornerstone of management of acute small bowel volvulus.
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