

Case Report

Postoperative Herniation of the Caecum Through the Gastroepiploic Foramen

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Herniation through the gastroepiploic foramen into the lesser sac is a rare cause of intestinal obstruction. The nonspecific nature of its presentation makes early diagnosis of this condition difficult. Internal herniation should be considered with a high index of suspicion in intestinal obstruction due to the high rate of morbidity and mortality associated with delayed treatment. We report the first case of caecal herniation with strangulation in the gastroepiploic foramen occurring in a postoperative patient. Decompression and reduction of the strangulated caecum was performed, followed by a right hemicolectomy. The clinical and radiological features are presented from a review of the literature on gastroepiploic foramen herniation. [*Asian J Surg* 2005;28(4):291-4]

Key Words: foramen of Winslow, gastroepiploic foramen, internal hernia, lesser sac, postoperative complication

Introduction

Internal herniation is an uncommon cause of intestinal obstruction, accounting for less than 1% of cases.¹⁻³ Approximately 50% of internal hernias are paraduodenal,^{2,3} with the remainder consisting of paracaecal, gastroepiploic foramen, transmesenteric, paravesical and intersigmoid hernias. Herniation via the gastroepiploic foramen (foramen of Winslow) accounts for 8% of internal hernias,^{1,2,4,5} and usually involves a loop of small bowel, caecum or greater omentum.^{1,4,6,7} Caecal herniation via the gastroepiploic foramen in a postoperative patient resulting in intestinal obstruction and strangulation has not been previously described.

Case report

We present the case of a 74-year-old female who was initially admitted to a rural peripheral hospital with a high intersphincteric abscess. This was drained under general anaesthesia and a three-way catheter inserted into the abscess

cavity for subsequent irrigation. The following day, the catheter was dislodged and, shortly after, the patient developed acute abdominal pain with profuse vomiting. There was no history of previous abdominal surgery. She was euvolaemic with no change in her haemodynamics. Plain abdominal X-ray (Figure 1) and abdominal computed tomography (CT) (Figure 2) suggested a caecal volvulus.

The patient was deemed likely to require postoperative ventilation, and as there was no intensive care unit at the referring hospital, she was transferred 90 minutes by road to our hospital for definitive management. On arrival, she was hypothermic (35.4°C) and moderately dehydrated but haemodynamically stable. Abdominal examination revealed a large, tense, tender epigastric mass with generalized abdominal tenderness, guarding with rebound tenderness and absent bowel sounds.

Routine blood investigations revealed a haemoglobin of 128 g/L with a white cell count of $15.2 \times 10^9/L$, consisting of $13.3 \times 10^9/L$ neutrophils. Blood chemistry revealed a sodium concentration of 135 mmol/L, potassium concentration of

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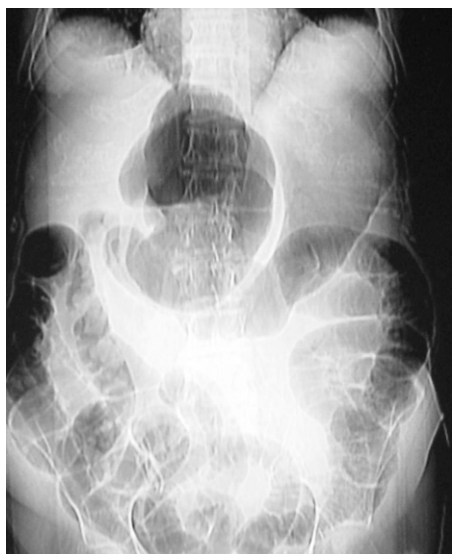


Figure 1. Plain abdominal X-ray showing a gas-filled epigastric mass displacing the stomach to the left. The “hilum” of the kidney-shaped mass points to the right.

3.6 mmol/L, bicarbonate concentration of 24 mmol/L, urea concentration of 8.3 mmol/L and a creatinine concentration of 85 µmol/L. Serum amylase and lipase levels were normal. Liver function tests were essentially normal except for an albumin concentration of 27 g/L.

As the patient was initially oliguric, active fluid resuscitation with central venous pressure monitoring was commenced. A midline laparotomy was performed and a moderate amount of peritoneal fluid with fibrin was encountered. The ascending colon was exceedingly mobile and the caecum and terminal ileum were herniated into the lesser sac via an enlarged gastroepiploic foramen. There was closed-loop obstruction of the caecum with marked dilation causing a firm tympanic mass in the lesser sac. This was decompressed with a fine-bore hollow needle and the caecum reduced. The caecum appeared thin-walled and fragile and was nonviable. Upon reduction of the caecum, the patient became hypotensive due to systemic absorption of toxins from the necrotic caecum and required inotropic support. A right hemicolectomy was then performed with a two-layered, end-to-end anastomosis. The gastroepiploic foramen was found to be enlarged and was reduced in size using a single suture.

Postoperatively, the patient remained on ventilatory support and was initially acidotic and mildly hypoxaemic. She was gradually weaned off inotropic support, although she remained oliguric despite fluid challenges and loop diuretics. She progressed to acute renal failure, with creatinine rising to 248 µmol/L, and there was hepatocellular damage – probably from global ischaemia – with the alanine aminotransferase rising to 1,897 U/L and aspartate aminotransferase to 3,183 U/L.

As her ongoing management requirements exceeded the capacities of our intensive care unit, the patient was transferred to a tertiary referral centre for ongoing management with a view to short-term haemodialysis. The acute renal failure resolved with supportive management and she did not require dialysis. There were also problems with malnutrition and hypoalbuminaemia, with severe deconditioning and loss of muscle strength from her prolonged recovery period. She was discharged home 6 weeks after the initial event with recovery of most of her premorbid function.

Discussion

Although rare, internal herniation should be considered among the differential diagnoses for the causes of bowel obstruction. This is because considerable morbidity and mortality can result from delay in the diagnosis of internal herniation and the subsequent complications. Mortality rates of 50% have been reported in patients with internal herniation.^{1,2,4,7} Gastroepiploic foramen herniation occurring *de novo* post-operatively has not been previously described. We intend to focus our discussion on foramen of Winslow herniation.

Many mechanisms have been suggested for herniation through the gastroepiploic foramen, but the four major predisposing factors include:⁸ an abnormally large gastroepiploic foramen (defined as large enough to admit 4 fingers⁴); an abnormally mobile caecum and ascending colon caused by the failure of secondary fusion of the colon with the posterior



Figure 2. Computed tomography of the abdomen. A rounded, gas-filled mass is seen between the stomach and the liver. The posterolateral aspect of the mass lies between the porta hepatis and the inferior vena cava.

abdominal wall in fetal development;^{1,2,8} an abnormally long mesentery resulting in a mobile small intestine; and a common mesentery for the entire small and large intestine.¹

Another interesting point of note is that one of the postulated causes of caecal volvulus in the postoperative patient is the transient ileus leading to distension of the bowel, particularly in the caecum, and allowing torsion in its vascular pedicle.^{9,10} On speculation, this combined with the positioning of our patient in a head-down position for drainage of the intersphincteric abscess may have been a significant, but certainly unpredictable, causative factor. Although the peritoneal cavity was not entered during drainage of the intersphincteric abscess, making ileus less likely, postoperative ileus can develop after all types of surgery, including extraperitoneal surgery.¹¹ Nonetheless, the head-down position is likely to have been contributory in this patient with a mobile caecum and enlarged gastroepiploic foramen as predisposing factors for internal herniation.

The nonspecific manner in which internal herniation presents makes it difficult to diagnose early. Clinically, patients with gastroepiploic foramen herniation typically present with a sudden onset of upper abdominal pain that may be relieved by leaning forward or flexing the trunk^{1,4,6,12} and exacerbated if the trunk and hips are extended.¹ Vomiting is not usually a prominent feature.^{1,4,12}

The distinguishing feature (although not always present) on examination is a rounded tympanic epigastric mass,^{4,6} which was a prominent sign in our patient. Rebound tenderness and guarding are usually absent even when there is strangulation due to the deep location of the hernia and the separation of this from the parietal peritoneum of the anterior abdominal wall by the stomach and the lesser omentum.^{1,4} Uncommonly, there may also be signs of obstructive jaundice, with four cases reported in the literature.^{12,13}

Plain abdominal radiography may reveal a collection of gas medial to the stomach, displacing it anteriorly and to the left.^{1,14-16} Dainko describes the appearance of a single gas-filled viscus with an air-fluid level in herniation of the colon, whereas when the small intestine is involved, there will be several air-fluid levels located medial to the stomach.¹ Plain radiographs of caecal herniation through the gastroepiploic foramen can appear similar to those of caecal volvulus,¹⁷ where there is a kidney-shaped loop of bowel in the upper abdomen and absence of the caecum in the usual position in the right iliac fossa. Differentiation between the two conditions has been described, with the "hilum" of the kidney-shaped loop pointing towards the right iliac fossa in caecal volvulus

but pointing towards the gastroepiploic foramen in caecal herniation through the foramen of Winslow¹⁷ (Figure 1).

With the common availability of CT, several characteristic appearances specific to this type of herniation have been described:¹⁶ the presence of mesentery between the inferior vena cava and portal vein; a collection of gas/fluid in the lesser sac with a "beak" directed toward the gastroepiploic foramen; the absence of the ascending colon in the right gutter; and two or more loops of bowel (representing the displaced ascending colon and terminal ileum) in the high subhepatic space near the porta hepatis.

The importance of early diagnosis of gastroepiploic foramen herniation is for early surgical intervention, reduction of the herniated contents and closure of the enlarged gastroepiploic foramen.¹² Occasionally, there may be difficulty in reducing the hernia, as in our case, and decompression of the distended caecum with a hollow-bore needle may be required.^{4,6}

If the reduced bowel loop is suspected to be nonviable, small bowel resection should be performed or, as in our case, a right hemicolectomy for strangulation of the caecum and terminal ileum. If the herniated contents are viable, closure of a particularly large gastroepiploic foramen by careful peritoneal suturing may be all that is required, although some argue that closure of the foramen poses more harm in damaging vital adjacent structures.⁴ Fixation of the caecum in the right iliac fossa has also been suggested,^{6,12} although benefits may be limited as there have been no reports of recurrences of this type of hernia.

Conclusion

Although rare, herniation through the gastroepiploic foramen and other internal herniation should be considered with a high index of suspicion in small bowel obstruction due to the high rate of morbidity and mortality in delayed treatment. Treatment is by adequate fluid resuscitation and early surgical intervention.

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