CASE REPORT

Difficult diagnosis: internal herniation of the terminal ileum through the foramen of Winslow into the lesser sac

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SUMMARY

Herniation of the bowel through the foramen of Winslow is rare and accounts for 8% of all internal herniae. It typically presents clinically and biochemically as small bowel obstruction. It carries a high mortality as diagnosis is often delayed, despite bowel strangulation, as clinical signs are not typical and imaging may not be diagnostic. In the case presented here, a healthy 25-year-old man was admitted with sudden onset right-sided abdominal and back pain. He denied vomiting, and had opened his bowels. His bloods were normal and venous lactate <2; CT was not diagnostic. At laparotomy, he was found to have internal herniation of the terminal ileum through the foramen of Winslow, which was gangrenous and required resection. This paper discusses the difficulty in diagnosing internal herniation and poses the question as to whether we are too dependent on CT findings in the setting of an acute abdomen.

BACKGROUND

Internal herniae in adults are especially rare (as compared to those in paediatrics) with an incidence of 0.2–0.9%.¹ Herniae through the foramen of Winslow account for only 8% of these. Moreover, since these are often strangulated at presentation, they are associated with a high mortality rate of up to 50%.² In the majority of cases, clinical signs and symptoms are vague and non-specific, with <10% diagnosed with preoperative investigations.³ Although emphasis is set on CT scanning for preoperative diagnosis, we show that it is not always diagnostic.

We present a case of a 25-year-old man with non-specific abdominal symptoms, highlights the importance of early recognition of strangulated internal herniae, despite the fact that laboratory tests may be within normal limits. If a diagnosis of internal herniation is suspected, the need for further investigations is crucial in order to aid prompt diagnosis and early surgical intervention.

CASE PRESENTATION

A fit and well 25-year-old man presented to the emergency department, with a 4 h history of sudden onset right-sided abdominal pain and severe bilateral lower back pain. His pain was constant and sharp in nature, and became diffuse over the next 12 h. He had opened his bowels normally that morning; he had nausea but no vomiting. Of note, the patient

stated a long-standing history of indigestion and postprandial fullness after small meals.

On examination, his abdomen was tense and tender in the right upper quadrant, right lumbar and right iliac fossa, with guarding. Bowel sounds were positive.

INVESTIGATIONS

At presentation, the patient's observations remained normal and stable for 24 h. His inflammatory markers and white cell count were not raised; serum amylase was normal. His lactate on a venous blood gas was 1.24. Urinalysis was negative.

DIFFERENTIAL DIAGNOSIS

Initial clinical differential diagnosis included peptic ulcer disease with perforation, biliary colic and appendicitis.

Chest radiograph showed no free air under the diaphragm; however, a large gastric bubble was noted. Abdominal CT scan was suggestive of retro-peritoneal gas, with a distended stomach (figure 1). At this stage, the working diagnosis was a sealed-off perforation of a duodenal ulcer.

Antibiotics were given and a nasogastric tube was inserted with little symptomatic relief.

The CT scan was re-discussed with a senior radiologist, who ruled out free gas. A passing comment regarding internal herniation was made by the radiologist in the absence of any specific diagnostic findings on CT.

Further investigation was sought in the form of a gastrografin meal and follow-through. This showed gastric outlet obstruction on initial and delayed films (figure 2).

Figure 1 Multidetector row CT scan: no definite free gas demonstrated. The stomach is distended. There is gastric outlet obstruction or gastroparesis. Red arrow: gas, found to be intraluminal at laparotomy.

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Figure 2 Abdominal X-ray after gastrografin meal—gastrografin remained in the stomach 1 h after consumption.

TREATMENT

Fifteen hours following surgical admission, the patient was in severe pain and, on examination, his abdomen was tender in the epigastrium and right hypochondrium, with guarding. He was taken to theatre for an urgent exploratory laparotomy.

At operation, there was internal herniation of the terminal ileum through the foramen of Winslow into the lesser peritoneal cavity (figures 3 and 4). This bowel was gangrenous and therefore resected, with side-to-side stapled anastomosis undertaken.

OUTCOME AND FOLLOW-UP

The patient did well postoperatively and was discharged home.

Figure 3 CT scans (coronal and axial abdominal views) showing caecum and terminal ileum in the foramen of Winslow (green arrows).

Figure 4 CT scans (coronal and axial abdominal views) showing caecum and terminal ileum in the foramen of Winslow (green arrows).

DISCUSSION

An internal abdominal hernia is defined as a protrusion of an intraperitoneal viscus into a compartment within the peritoneal cavity. Ghahremani classified internal herniae as: paraduodenal herniae (50–55%), foramen of Winslow (6–10%), transmesenteric herniae (8–10%), pericaecal herniae (10–15%), intersigmoid herniae (4–8%) and paravesical herniae (<4%).^{4 5}

The protrusion of intra-abdominal viscera through the foramen of Winslow, a communication between the greater and lesser sac, is a type of herniation, since this peritoneal opening is normally kept shut by intra-abdominal pressure.⁶ The foramen of Winslow boundaries include the duodenum inferiorly, the caudate lobe of the liver superiorly, vena cava posteriorly and the hepatoduodenal ligament anteriorly, which contains, of note, the portal vein, common bile duct and hepatic artery. In 60% of cases the herniated viscera is isolated in the small bowel.⁷

Risk factors for this type of hernia, as described by Erskine,⁸ include a large foramen of Winslow, a long small bowel mesentery, common intestinal mesentery, an elongated right liver (eg, Riedel lobe) and persistence of the ascending mesocolon enabling increased mobility of the bowel.⁷

Less than 250 cases of internal herniation have been reported since it was first described by Blandin in 1832. This shows the rarity of such cases, and since herniation through the foramen of Winslow is associated with high likelihood of strangulation, it is crucial for early preoperative diagnosis to prevent the possibility of morbidity and mortality, as in the case of McKenzie and Wood.⁹

In this case, clinical signs and symptoms were non-specific and of very little use in diagnosing an internal herniation. This is supported by previous reports of similar cases, in which a variety of different gastrointestinal symptoms are described in the patients' presentations. Although symptoms have been associated with those related to small bowel obstruction, both in this case and in the case of McKenzie and Wood,⁹ there was no vomiting. Our patient presented having opened his bowels. On closer study, although there was complete obstruction of ileum, there were no clinical or radiological suggestions of small bowel obstruction, possibly because of absolute obstruction of the duodenum caused by the loop of bowel.

It is of great curiosity as to why the patient's inflammatory markers and lactate level remained normal despite the presence

of gangrenous bowel. A recent study by Tanaka *et al*¹⁰ concluded that a lactate level of 2 mmol/L or greater is useful in predicting strangulation in cases of bowel obstruction. In this case, it should be highlighted that, despite small bowel strangulation and subsequent necrosis evident at laparotomy, laboratory findings remained within normal limits, as did the patient's lactate level (1.24) for the first 24 h.

In the case presented here, the CT was unable to diagnose internal herniation, and did not show bowel obstruction and ischaemia. Wojtasek *et al*,¹¹ and subsequently Schuster *et al*,¹² described CT findings of herniae through the foramen of Winslow: mesentery and associated vessels posterior to the hepatic artery, common bile duct and portal vein, a 'bird beak sign' (gas fluid level in the lesser sac with a 'beak' pointing towards the foramen of Winslow), absence of the caecum and ascending colon in the right gutter, and two or more loops of bowels in the superior subhepatic space. None of these CT findings were demonstrated on our patient's CT.

Multidetector row CT (MDCT) scans have recently become widespread in the diagnosis of internal herniae. MDCT scans produce high-quality, multiplanar reconstruction (MPR) images using axial slices, which are able to identify the exact location of an internal hernia. González *et al*⁶ reported two correct pre-operative diagnoses of internal herniation through the foramen of Winslow, using MDCT. Furthermore, MDCTs have been shown to identify dead bowel. Kosaka *et al*¹³ were able to confirm incarcerated small bowel from a series of axial sections and coronal images from MDCT data.

Despite the use of MDCT to aid diagnosis in our patient, there were no clear signs of internal herniation, bowel obstruction or gangrene. The MDCT showed an unusual gas pattern in the retroperitoneum. However, this was very sparse and not characteristic of obstruction. A study by Pongpornsup *et al*¹⁴ in the use of MDCTs in the diagnosis of small bowel obstruction, found a sensitivity of 96%, specificity of 100% and accuracy of 97%. Therefore, it was surprising that the CT findings were negative in our patient despite the degree of gangrene, which was obvious at laparotomy.

Ultimately, our patient was taken to theatre for an urgent exploratory laparotomy in light of his deteriorating clinical condition, despite his falsely reassuring biochemical markers and non-diagnostic MDCT.

This case highlights the importance of repeated clinical assessments of a patient, rather than relying on investigations, in order to diagnose the patient and determine appropriate management. In this case, there was a high index of suspicion for intra-abdominal pathology, so despite vague presenting signs and no firm diagnosis, it was felt that a laparotomy was the only way to proceed. This illustrates the truth behind the adage:

The biggest impediment to the correct diagnosis of acute abdominal conditions is the abdominal wall, therefore breach it.
(Anonymous)

Learning points

- ▶ Internal herniae are difficult to diagnose.
- ▶ Without targeted CT scanning, diagnosis of an internal hernia may be delayed, increasing the risk of mortality and morbidity.
- ▶ Despite the rarity of internal herniation, this finding should always be considered if the diagnosis is uncertain and the patient continues to deteriorate.

Contributors SN, DC, SC and JK admitted the patient. SN, DC and JK reviewed the patient after admission. JK formulated the management plan and operated on the patient. SN and DC wrote the case report. SC provided two images for the case report. SN, DC and JK contributed to refinement of the final report and approved the manuscript.

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