Online Case Report

Delayed diagnosis of infarcted small bowel due to right-sided Bochdalek hernia

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We report a case of an adult patient with small bowel infarction, secondary to a strangulated Bochdalek hernia.

Keywords: Small bowel infarction – Bochdalek hernia

Congenital diaphragmatic hernias are usually detected *in utero*, or present as respiratory distress in neonates. The most common is a Bochdalek defect, occurring at the peripheral and posterior aspects of the diaphragm. Historically, they have been described as occurring most commonly on the left side of male neonates.¹

Case report

A 35-year-old female presented to the accident and emergency department with a 7-h history of severe central abdominal pain, associated with vomiting. She was previously fit and healthy, with no significant past medical history. There was no history of recent trauma or surgery. On examination, she was haemodynamically stable and afebrile. She had a soft abdomen but was tender in the right upper quadrant to deep palpation. Bowel sounds were present and normal. The respiratory examination was normal.

All the blood tests were normal except for a white cell count of 19.4×10^3 per mm^3 . A provisional diagnosis of acute cholecystitis was made, but an erect chest X-ray was obtained to exclude a perforated viscus. This revealed bowel loops under the right hemidiaphragm, above the liver (Fig. 1). The chest X-ray was reviewed by the radiologist, and Chilaiditi's sign was considered to be the

most likely explanation. In view of the limited abdominal signs and the absence of respiratory distress, no further investigations were carried out on admission, so the patient was admitted to the ward for observation.

Over the following 48 h, the patient developed increasing pain. However, her symptoms appeared disproportionate to the abdominal signs on repeated examination. Subsequent ultrasound scan of her abdomen revealed free fluid in the right upper quadrant, but was otherwise normal. At this point, she became increasingly unwell, and abdominal examination revealed signs of peritonitis. As a result, she underwent a laparotomy for a suspected perforated viscus.

Figure 1 Chest X-ray showing bowel loops under the right hemidiaphragm above the liver.

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At laparotomy, we found that the mid-jejunum disappeared through a small defect in the posterior margin of the right cupola of the diaphragm. The defect in the diaphragm was extended to allow the delivery of four feet of infarcted bowel back into the abdominal cavity. The Bochdalek diaphragmatic hernia was closed with 1 PDS. The infarcted small bowel was resected and a primary anastomosis was performed.

Following 24 h in the intensive care unit, she made an uneventful postoperative recovery on the ward. She was discharged home 12 days following surgery.

Discussion

Congenital diaphragmatic hernias result from failure of the pleuroperitoneal canal to close at the eighth week of gestation.¹ In 1848, Hugh Vincent Bochdalek described a congenital posterolateral diaphragmatic hernia. This occurs in 1 in 2000 to 1 in 5000 live births.²

Chilaiditi's sign was first described by Demetrius Chilaiditi in 1910. This is an incidental radiological finding of hepatodiaphragmatic interposition of bowel, in asymptomatic patients. Chilaiditi's syndrome is defined as symptoms due to bowel interposition. These symptoms include abdominal pain, nocturnal vomiting, anorexia and abdominal distension with loss of liver dullness. There have been 27 published cases of Chilaiditi's syndrome in the literature.³

The majority of Bochdalek hernias present at birth with respiratory distress. There are some reports of delayed presentation in the postnatal period with abdominal pain and failure to thrive. In 2001, Mullins *et al.*⁴ retrospectively reviewed 13,138 abdominal CT reports, in order to establish the prevalence of asymptomatic Bochdalek hernias in adults. They found that Bochdalek hernias are more common in women than had previously been reported, and more frequently right-sided than the literature suggests. A third of patients were found to have abdominal contents within asymptomatic Bochdalek hernias.⁴

Current literature contains 100–150 cases of Bochdalek hernias in adults, the majority of which were asymptomatic. Of the 11 symptomatic cases reported in the literature, the

majority presented with abdominal pain due to gastrointestinal obstruction, and some presented with chest symptoms. There have been two reported cases of sudden death in adults. The majority of the symptomatic cases were left-sided hernias involving stomach, omentum and large bowel. One female patient, presenting with hypoxia and dyspnoea, was found to have a right-sided Bochdalek hernia containing colon and the right kidney.⁵ Right-sided defects are larger than the left and are, therefore, less likely to obstruct and cause symptoms.

Conclusions

This case illustrates some of the difficulties in diagnosing Chilaiditi's syndrome and the consequences of misdiagnosis. Strangulated diaphragmatic hernia should be considered in the differential diagnosis of upper abdominal pain, especially in the presence of Chilaiditi's sign, and where the symptoms are out of proportion to the abdominal signs. In retrospect, following a normal ultrasound scan, a CT scan of her abdomen may have been useful to expedite the diagnosis. This may have resulted in earlier diagnosis, and possibly avoided infarction of her small bowel and the need for resection.

This case highlights the need for a high index of suspicion of a strangulated diaphragmatic hernia, when presented with a patient of similar symptoms and chest X-ray appearance.

References

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