Incarcerated Bochdalek hernia causing bowel obstruction in an adult male patient

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ABSTRACT

Bochdalek hernias occur as a result of congenital fusion failure of the posterolateral muscular portion of the diaphragm derived from the embryonic pleuroperitoneal membrane. The vast majority of symptomatic Bochdalek hernias are diagnosed during the neonatal period. Congenital diaphragmatic hernias showing symptoms in adulthood are rare. We report the case of a 28-year-old man who presented with subacute bowel obstruction, later diagnosed to have a left-sided incarcerated Bochdalek hernia containing an ischaemic splenic flexure and the distal transverse colon. During laparotomy, he underwent primary repair of the diaphragmatic defect and an extended right hemicolectomy with ileocolic anastomosis. The patient made a good recovery and is well at three months following surgery. This case highlights the need for surgeons to be vigilant about rare types of congenital internal hernias as they may become symptomatic later in life.

KEYWORDS

Bochdalek hernia – Diaphragmatic hernia

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Bochdalek hernias (BHs) occur as a result of congenital fusion failure of the posterolateral muscular portion of the diaphragm derived from the embryonic pleuroperitoneal membrane. The vast majority of symptomatic BHs are diagnosed in the paediatric population, ranging from the neonates to preschoolers. Approximately 80–95% of symptomatic cases are diagnosed within the first eight weeks of life.^{1,2} Since the first description of this entity by the Czech anatomist Vincent Alexander Bochdalek in 1848,³ only around 100 cases of symptomatic BHs in adults have been published up to 2007. We report the case of a young man who presented with bowel obstruction secondary to an incarcerated left-sided BH.

Case history

A 28-year-old previously healthy Sri Lankan man presented with epigastric bloating and several episodes of bilious vomiting. His bowels had not opened for three days. He had been well up to the onset of his current symptoms and did not have a history of trauma to the abdomen or chest. His general examination was unremarkable. His abdomen was soft, mildly distended and non-peritonitic, and there were normal bowel sounds. Clinical examination of the chest was normal.

Initial haematological and serum biochemical investigations were unremarkable. Abdominal plain radiography showed dilated small bowel loops and multiple air–fluid levels. Erect chest radiography excluded free air in the

peritoneum but showed a prominent large bowel shadow above the gastric shadow at what was perceived to be an elevated left hemidiaphragm (Fig 1).

The patient was initially managed with intravenous fluids and nasogastric decompression, which provided good symptom relief over the first 24 hours, leading to several diarrhoeal motions. As computed tomography (CT) was not available at the institution, he was referred to the regional centre for this investigation the following day. His clinical, haematological and biochemical parameters remained stable throughout except for an elevated neutrophil count of 13,600/mm³ on the second day. CT showed an incarcerated left diaphragmatic hernia with the splenic flexure and distal transverse colon trapped in the left hemithorax (Fig 2). Surgical exploration was therefore planned on the same day.

The patient underwent a laparotomy under general anaesthesia. Operative findings confirmed the incarcerated left Bochdalek hernia containing the splenic flexure, the distal transverse colon and the entire omentum. Spleen and stomach remained in the abdomen, and the proximal large bowel and the entire length of the small bowel were dilated. Despite the incompetent ileocaecal valve, there were a few haemorrhagic patches in the dilated caecum; rest of the peritoneal survey was unremarkable. The contents of the hernia were carefully reduced back to the abdomen to note a grossly ischaemic splenic flexure with impending perforation. There was no hernial sac, causing an obvious pleural breach (Fig 3).

Figure 1 Erect chest radiography showing a prominent large bowel shadow (white arrow) above the stomach (containing a nasogastric tube)

Figure 2 Computed tomography confirming the diaphragmatic hernia defect (white arrow) and presence of the splenic flexure in the left hemithorax (black arrow)

A left tube thoracostomy was performed before the primary repair of the diaphragm defect (measuring about 6cm) using size 2 polypropylene sutures. Given the ischaemic splenic flexure and unhealthy dilated caecum, an extended right hemicolectomy was performed and bowel continuity was achieved by a hand-sewn ileocolic anastomosis. The postoperative period was uncomplicated and the patient was discharged on day 6. He remains well at three months following surgery.

Discussion

Bochdalek hernias are a congenital anomaly resulting from fusion failure of the posterolateral muscular portion of the diaphragm, seen in about 1:2,200 to 1:12,500 live births.⁴ The majority of cases present with acute respiratory symptoms during the neonatal and postnatal period. Such presentations are rare among adults and only about 100 cases have been reported up to 2007.⁵ Symptomatic adults may present with longstanding vague abdominal symptoms and respiratory difficulties or acute bowel obstruction.^{5,6} The diagnosis may only be made following a sudden death.⁷

Probably owing to the higher frequency of abdominal imaging, a greater number of incidental BHs have been picked up recently. Mullins *et al* reported that among 13,138 abdominal CT scans performed in a single institution within a year, 22 asymptomatic incidental BHs (0.17%) were found.² They also noted a higher frequency of incidental BHs on the right side despite the majority of neonatal symptomatic BHs being on the left.

Although it is not clear whether BHs diagnosed in symptomatic and asymptomatic adults have remained herniated from childhood, it has been postulated that increased intra-abdominal pressure might have aggravated them.^{2,6,7} CT is confirmatory for the diagnosis of a BH but plain radiography may provide good guidance in settings where such facilities are unavailable.

Management of BHs diagnosed in adults includes reduction of the herniated contents and primary or reinforcement mesh repair of the defect via an appropriate surgical approach depending on need and expertise.^{1,3-6} In a review of 184 adult cases of BHs that were surgically repaired, Machado reported the most frequent surgical approach as laparotomy (40.3%), followed by thoracotomy (27.7%), a combined thoracoabdominal approach (14.6%), laparoscopy (12.5%) and thoracoscopy (4.9%), with a recurrence rate of 1.6% and an overall mortality rate of 2.7%.⁶ All three cases of recurrence had initial repair of the hernia with mesh reinforcement by thoracotomy or the thoracoabdominal approach and no precipitating factors were identified for the recurrence. In addition, Machado's detailed review emphasises the initial higher misdiagnosis rate of BHs due to the ambiguous nature of their presentation.

Conclusions

This case highlights the importance of surgeons being vigilant about rare types of congenital internal hernias including BHs as they may lead to acute or subacute symptoms later in life.

Figure 3 Perioperative photograph of the defect in the muscular portion of the left hemidiaphragm (white arrow) and the ischaemic splenic flexure after being delivered into the abdomen (black arrow)

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