

CAECAL VOLVULUS SECONDARY TO A BOCHDALEK HERNIA IN AN ADULT PATIENT**Dr. Darren J. Porter*, Samuel Price, Magnus Johnston, Judith Sayers, Michael Proctor**

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ABSTRACT

A Bochdalek hernia is an uncommon presentation in an adult patient. When present they tend to be left - sided, asymptomatic and rarely contain large bowel. When symptomatic, Bochdalek hernias in adults tend to cause gastro - intestinal symptoms in contrast to the paediatric population where respiratory symptoms are typical. Contrast induced CT chest and abdomen has a high sensitivity for diagnosis of Bochdalek hernias, and when demonstrated, they should be managed surgically with either minimally invasive or open surgery.

KEYWORDS: Caecal volvulus, Bochdalek hernia, large bowel obstruction.**INTRODUCTION**

A Bochdalek hernia is a congenital diaphragmatic hernia caused by failure of the postero - lateral diaphragmatic foramina to fuse adequately during the ninth or tenth week of foetal life. This results in the displacement of abdominal contents into the thoracic cavity.^[1]

Bochdalek was the first to describe this anomaly in 1848.^[2] A Bochdalek hernia is almost exclusively a paediatric disease that presents with pulmonary symptoms between the neonatal period and pre - school age.^[3]

Bochdalek hernias are rare, occurring in between 1 in 2,200 and 1 in 12,500 live births, and in 80 - 90% of cases they occur on the left side, they are extremely rare in adults.^[4]

Larger Bochdalek hernias are associated with pulmonary hypoplasia on the affected side and neonatal respiratory distress syndrome. Minor defects are not associated with a deficit in lung development and may be asymptomatic until herniation of abdominal contents into the thoracic cavity with respiratory compromise occurs. The colon is the most common intra - abdominal organ to migrate through the diaphragmatic defect and large bowel obstruction, incarceration or strangulation may ensue.^[5]

Surgical repair of the hernial defect is the recommended treatment for all patients with Bochdalek hernias, regardless of the presence or absence of symptoms. This has traditionally been undertaken via laparotomy or thoracotomy, however in the elective setting

laparoscopic or thoracoscopic repair may be utilised depending on the surgeon's expertise.^[6]

We present a case of a 38year old lady who presented with a caecal volvulus secondary to a Bochdalek hernia with incarcerated transverse colon in the right hemi - thorax. This was repaired via an emergency laparotomy, reduction of the transverse colon into the abdomen, suture repair of the hernial defect followed by a right hemicolectomy.

We postulate that the obstruction in the proximal transverse colon due to the right - sided Bochdalek hernia caused proximal ascending colonic and caecal dilatation. As the caecum further distended, it rotated causing a volvulus.

We believe that this is a very rare presentation of a right - sided Bochdalek hernia and a secondary caecal volvulus that does not appear to have been reported in the literature to date.

CASE REPORT

A 38year old lady was admitted to the acute surgical unit with a 4day history of progressively worsening lower abdominal pain, abdominal distension and constipation, with absolute constipation for 24hours prior to presentation. She had a history of 2 Caesarean sections but no other surgical or medical history.

On admission examination this patient was clearly in pain, she was tachycardic and tachypnoeic with mild pyrexia, oxygen saturation was normal. On examination, the abdomen was grossly distended, a Pfannenstiel scar

was evident, and no external herniae were present. Palpation demonstrated tenderness in the right iliac fossa with localised peritonism, percussion demonstrated hyperresonance, bowel sounds were absent and per rectal examination demonstrated an empty rectum.

Admission bloods demonstrated a neutrophil leucocytosis (WCC $13.8 \times 10^9/L$) and a C - reactive protein of 10mg/L, renal function, liver function tests and lactate were normal. Urinalysis and pregnancy test were also normal.

The patient was fasted, intravenous access was established and parenteral morphine and intravenous fluids were administered. An urgent CT abdomen and pelvis was requested to exclude an adhesional obstruction or an internal hernia causing bowel obstruction.

CT abdomen and pelvis demonstrated a grossly distended caecum and ascending colon. A caecal volvulus was evident and a diaphragmatic hernia was noted in the posterior portion on the right side that contained a gas filled dilated colon, likely the hepatic flexure (Fig. 1 and Fig. 2).

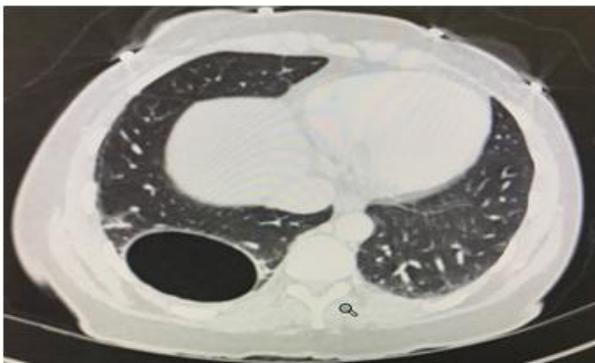


Figure 1: Axial image from a CT abdomen and pelvis demonstrating large bowel in the right hemi - thorax compressing the right lung.

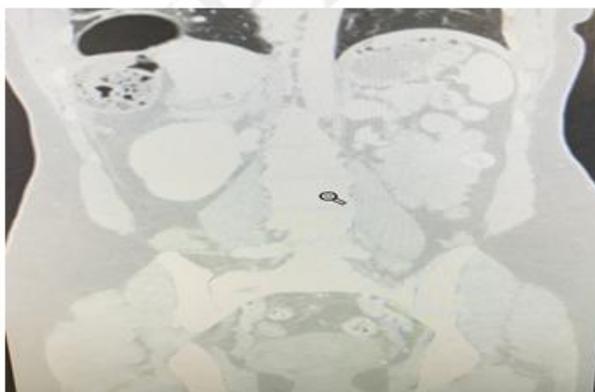


Figure 2: Coronal image from a CT abdomen and pelvis demonstrating proximal transverse colon in the right hemi - thorax after migrating through a right - sided Bochdalek hernia.

This patient underwent an urgent laparotomy and the caecal volvulus was reduced. The proximal transverse colon had migrated through the diaphragmatic hernia into the chest and this was returned to the abdominal cavity with blunt dissection and traction. The diaphragmatic hernia was measured at approximately 2cm and a suture repair was undertaken. On closer inspection of the caecum, there were areas of patchy necrosis and gangrene and hence a right hemicolectomy with a handsewn end - to - end ileo - transverse colonic anastomosis was performed, there were no intra - operative complications.

Post - operatively this patient was observed in the surgical high dependency unit for 24hours before being transferred to the surgical ward. She had no complications and was discharged home 1week post - operatively.

Histopathological analysis of the right hemicolectomy specimen confirmed the presence of acute mucosal ischaemia with no evidence of perforation or malignancy.

DISCUSSION

A Bochdalek hernia results when there is failure of closure of the diaphragm posteriorly during embryogenesis. This opening is most commonly a 2cm defect located just superior to the adrenal gland.^[7] 85% of Bochdalek hernias occur on the left side.^[8] Left - sided Bochdalek hernias may contain spleen, stomach, small bowel, omentum, pancreas, adrenal gland or colon, whilst right - sided hernias can contain liver, gallbladder, kidney, omentum or bowel. Bowel within a Bochdalek hernia is relatively rare.^[8]

The majority of Bochdalek hernias are asymptomatic and are found incidentally. Post mortem studies estimate the incidence of asymptomatic Bochdalek hernias in the adult population to be between 1 in 2000 to 7000.^[2] Symptomatic Bochdalek hernias in adults are relatively rare.^[2] Symptoms associated with Bochdalek hernias are most commonly pulmonary or gastrointestinal. Patients may present with chronic symptoms such as recurrent chest or abdominal pain and post - prandial fullness or vomiting.^[8] Dyspnoea, shortness of breath, or recurrent chest infections may be the presenting symptoms of Bochdalek hernias in adults, but symptomatic hernias in adults most commonly manifest with gastrointestinal symptoms.^[9]

Bochdalek hernias can be diagnosed via chest and abdominal X-ray, fluoroscopy, barium studies, or by CT or MRI scans. These hernias are evidenced by abnormal findings above the dome of the diaphragm, such as gas - filled loops of bowel or a soft tissue mass. Due to the low sensitivity of chest X-rays, Bochdalek hernias may be confused with other thoracic pathology, for example air space consolidation, or an anterior mediastinal mass. Contrast - enhanced CT is the most accurate imaging

modality for detection of Bochdalek hernias. It provides detailed information on the herniated viscera and the diaphragmatic defect. The presence of a soft tissue contour in the chest CT, in addition to radio - opaque - filled, dilated bowel segments above the diaphragm definitively establishes the diagnosis.^[10] Contrast - enhanced CT has a sensitivity of 78% for left-sided hernias and 50% for right-sided hernias.^[11]

The management of Bochdalek hernia includes reduction of hernial contents back into the peritoneal cavity and repair of the diaphragmatic defect. This can be achieved via a laparotomy but laparoscopic repair has gained popularity in recent years.^[10]

Suture repair of the defect is important to restore the anatomy between the thoracic and abdominal cavities. In addition to suture repair, a synthetic mesh may be utilised to give strength to the repair given the stress on the diaphragm from respiratory movements and cardiac motion.^[12] Although polypropylene mesh has the benefit of support and excellent tissue growth, erosion of the mesh into the gastrointestinal organs represents a theoretical risk.^[12] Care should be taken during fixation of the mesh with a laparoscopic tacker where the diaphragm is relatively thin.^[12]

CONCLUSION

Bochdalek hernias result from a failure of fusion of the postero - lateral diaphragmatic foramina. Although symptomatic Bochdalek hernias are common in the neonatal and early paediatric age groups, they are relatively rare in the adult population. Adult Bochdalek hernias are most common on the left side and when present most commonly present with gastrointestinal symptoms than with pulmonary symptoms. Contrast - enhanced CT chest and abdomen has a high sensitivity in diagnosing these uncommon hernias. When present, Bochdalek hernias should be repaired surgically. Depending on the presentation, this can be done via thoracoscopic or a laparoscopic approach or in the emergency setting via a laparotomy or a thoracotomy. Following reduction of the herniated viscera into the abdominal cavity, suture +/- mesh repair of the hernial defect should be undertaken.

GRANT

None

CONFLICTS OF INTEREST

We have no conflicts of interest to declare.

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