



## Laparoscopic Repair of a Right-Sided Bochdalek Hernia with Sigmoid in an Adult: A Case Report

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### Abstract

The Bochdalek hernia is a rare congenital defect in the posterolateral diaphragm, often presented at pediatric age with symptoms such as respiratory complaints due to mechanical obstruction of the intestines. Organs as the kidney, spleen and pancreas tend to herniate usually through the left hemidiaphragm. We present a case of a right sided Bochdalek hernia with an obstructed sigmoid colon in an adult. During my stay I had faith in the surgeon and nurses. They informed me well throughout the whole process and the surgeon was sincerely involved. I felt comfortable during my stay in the hospital and my recovery was quick.

**Keywords:** Bochdalek hernia; Laparoscopic repair; Hemidiaphragm

### Introduction

The Bochdalek hernia is a rare congenital defect in the posterolateral diaphragm, often presented at pediatric age with symptoms such as respiratory complaints due to mechanical obstruction of the intestines. Organs as the kidney, spleen and pancreas tend to herniate usually through the left hemidiaphragm [1,2]. We present a case of a right sided Bochdalek hernia with an obstructed sigmoid colon in an adult.

### Case Presentation

A 68-year-old woman with a history of constipation and anterior vaginal wall repair was presented at the emergency department with pain in the right lumbar region, migrating to the shoulder. Along with a cramping pain, she had the urge to move. Defecation was absent for seven days despite the use of laxatives whilst flatulence was present. Nausea occurred without vomiting. There was no relevant medical history or medication use. The blood pressure was 171/84 mmHg, with a heart rate of 66/min, and temperature was normal. Physical examination revealed abdominal distension, tympanic percussion, hyperactive bowel sounds and tenderness in the upper right lumbar region. No scars of previous operations were visible. Laboratory findings showed a C-reactive protein of 8 mg/L and leukocytes of  $6.4 \times 10^9/L$ .

### Investigations

The patient was examined with an abdominal Computed Tomography (CT). The CT revealed a mechanical ileus due to distal colonic obstruction most probably caused by a herniated dolichosigmoid colon through an opening in the right hemidiaphragm (Figure 1). There were no signs of intestinal perforation or necrosis.

### Diagnosis

A mechanical ileus of the colon due to a Bochdalek hernia of the sigmoid colon was diagnosed.

### Treatment

At the emergency room, the patient received paracetamol, morphine and gastric decompression via tube. The patient was admitted to emergency surgery.

During a diagnostic laparoscopy, the Bochdalek defect in the right hemidiaphragm was found with incarcerated sigmoid colon. The diaphragm was opened using diathermia in order to reduce the hernia. The mobilized colon and omentum were well perfused. The hernia sac was dissected and the diaphragm was closed with non-resorbable sutures and an only 10 cm coated polypropylene mesh, which was fixed to the diaphragm using tackers.

### OPEN ACCESS

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**Figure 1:** Oblique coronal CT image shows a defect of 5 cm in the right posterior diaphragm with a herniating sigmoid loop into the right hemithorax.

### Outcome and follow-up

The patient recovered well following the ‘Enhanced Recovery after Surgery’ protocol, no adverse events took place. The mechanical ileus resolved and at the first postoperative day all catheters were removed. On the third day postoperatively, the patient was discharged. Further recovery was uneventful.

### Discussion

This is probably the first case of an adult patient presenting with an ileus due to herniation of the sigmoid colon through a right sided Bochdalek hernia. Cases of a Bochdalek hernia are rare, especially in adults, with an incidence of 0.17% [2]. In adults, only 27% of these hernias are found in the right hemidiaphragm. When presenting, the transverse colon is most frequently involved in the herniation.

Early diagnosis and surgical laparoscopic repair are important for this group of patients considering the mechanical ileus will not resolve by conservative therapy. Treatment is often surgically: By laparoscopy, by VATS, or by open repair. Recurrence rates for patch repair are higher than for primary repairs, 27% to 41% vs. 4% to 13%, respectively [1].

The Bochdalek hernia is a congenital defect in the diaphragm. Formation of the diaphragm normally takes place by closing of the pleuroperitoneal communication at week 8 of gestation. The right canal closes before the left canal. Hereby, 85% of all Bochdalek hernias are left-sided. At the pediatric age, patients present often with respiratory symptoms. Herniation of the abdominal organs into the thorax may cause mechanical compression of the developing lungs. Sometimes, this results in lung hypoplasia. Congenital diaphragmatic hernias occur in 1 in 2000/3000 births. Of those, about 70% to 75% is a posterolateral hernia, called the Bochdalek hernia [1,3].

The exact etiology is unknown. Both genetic and environmental factors may contribute to this defect. In approximately 30% of Bochdalek hernias, a genetic cause is found. Gene copy number variants, chromosome irregularities and DNA sequence variants are found. Often, with genetic causes like these, multisystem anomalies are found as well [1]. Bochdalek hernias and other congenital diaphragmatic hernias are associated with pulmonary, intestinal and cardiac defects like intestinal malrotations [4], the tetralogy of Fallot [5], hypoplasia of the liver [6] or lungs [7] and Meckel’s diverticulum [8].

### Patient’s Perspective

“I had persisting complaints of abdominal pain and even pain in my shoulder. After already two reassessments at the emergency room, I was sent home again with laxatives. I do understand why, since there was no fever or elevated infection parameters. After three more days my general practitioner sent me to the hospital for reassessment and eventually admission.”

“During my stay I had faith in the surgeon and nurses. They informed me well throughout the whole process and the surgeon was sincerely involved. I felt comfortable during my stay in the hospital and my recovery was quick.”

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