

Obstructed Descending Colon Mass Presented With Bochdalek Hernia: A Case Report

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ABSTRACT: The adult Bochdalek hernia is one of the right-sided diaphragmatic hernias that less than 30 cases reported until now. Here, we report a 64-year-old female patient who presented with dyspnea, abdominal pain, and nausea. Primary imaging showed a right-sided diaphragmatic hernia that contained the liver and right colon. At first, the patient underwent a right posterior thoracotomy, and the diaphragmatic defect was repaired. After 2 days, abdominal peritonitis happened then a midline laparotomy was performed. Finally, it was clear that the main problem was the obstructed and perforated descending colon mass that was presented with Bochdalek hernia. Unfortunately, the patient passed away 2 days after the operation. It should be considered that an increase in intra-abdominal pressure like the presence of obstructed colon mass can cause this rare hernia and It is important to determine the reason for the presentation of the symptomatic Bochdalek hernia in adult patients.

KEYWORDS: Diaphragmatic hernia, colonic mass, Bochdalek hernia

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Introduction

Diaphragmatic hernias are either congenital or acquired from diaphragmatic trauma.¹ In terms of anatomic location, the congenital diaphragmatic hernia (CDH) can be classified as Bochdalek type when an incomplete pleuroperitoneal channel occlusion is found in a posterolateral.² A PubMed search showed that <30 cases reported that right-sided Bochdalek hernia (BH) contains a colon and liver in adults.³ To the best of our knowledge, this is the first report of an adult patient whose right-sided BH was accompanied by obstructed descending colon mass.

Case Presentation

A 63-year-old female who had a history of hypertension and Rheumatoid Arthritis resorted to the emergency department for nausea, intermittent epigastric pain, and dyspnea. The symptoms started 2 months ago and were getting worse for the past 7 days. She was not passing flatus in the last 24 hours and had not opened her bowels for 7 days with no relevant previous history. The patient had no history of previous trauma or abdominal surgery.

On physical examination, vital signs were normal except for an elevated blood pressure of 140/100 and mild tachycardia (Pulse rate: 110). Also, lung examination was significant for decreased breath sounds in the lower-right lobe with no dullness to percussion or associated wheezing, Rales, or rhonchi. Her abdomen was slightly tender, with mild distension. Initial laboratory findings showed impairment of creatinine level. Laboratory findings are summarized in Table 1. The chest and

abdominal X-rays were performed and showed large opacity in the right hemithorax that combined with an air-fluid level in the right hemithorax (Figure 1a). So, she suspected having a right diaphragmatic hernia. After primary fluid resuscitation, a thoracoabdominal CT scan without IV contrast was made, which confirmed a right-sided diaphragmatic hernia with herniation of the ascending colon and liver into the right hemithorax (Figure 1b and c). One day after admission, the patient's abdominal pain got worse, especially on the right side. Hence, we decided to do the operation. A right-sided posterolateral thoracotomy was performed. Intraoperatively; it revealed that the liver, ascending colon and transverse colon were present in the right hemithorax (Figure 2). There was no evidence of a hernia sac and a 5 cm × 5 cm diaphragmatic defect was seen. Primary repair of the diaphragm was done with a tension-free, separated, vertical mattress Prolene 1 suture. After the operation, the patient was transferred to the ICU. Postoperative chest X-rays showed that the right lung was completely expanded (Figure 3). Two days after the initial operation, urine volume decreased by a 0.03 cc per hour, metabolic acidosis developed, serum creatinine, and heart rate increased (130 per minute), and reductions were found in blood pressure and the level of consciousness. Hence, the patient required inotropic agents (dopamine and norepinephrine). The patient was intubated due to respiratory distress and decreased O₂ saturation. Intraabdominal pressure was assessed by intra-bladder pressure, which was more than 45 cm H₂O. All of this happened in less than 12 hours. Therefore, the patient underwent laparotomy due to suspected abdominal compartment syndrome. A



Table 1. Laboratory findings based on time line.

LABORATORY DATA	ON ADMISSION TIME	AFTER FIRST 24 H	AFTER 3 DAYS OF THORACOTOMY
HGB (g/dl)	10.8	10.2	9
WBC ($\times 10^3/\mu\text{l}$)	6.8	7.8	4.6
Neutrophil (%)	73	70	70
Platelets ($\times 10^3/\mu\text{l}$)	234	241	150
K (mmol/dl)	4.2	3.8	3.5
Na (mmol/dl)	138	140	135
BUN (mg/dl)	30	17	44
Cr (mg/dl)	2.4	1.6	3.3
PH	7.4	–	7.34
BE	8	–	–5
PCO ₂ (mmHg)	51	–	50
HCO ₃ ⁻ (mEq/L)	32	–	21

Abbreviations: BE, base-excess; BUN, blood urea nitrogen; Cr, creatinine; HGB, hemoglobin; WBC, white blood cell.

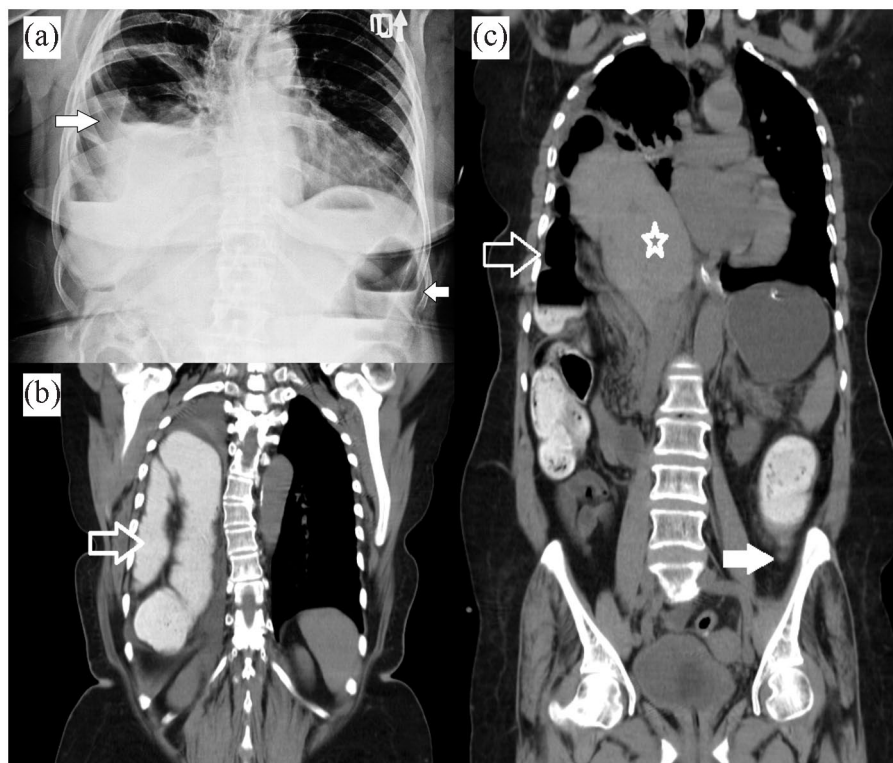


Figure 1. Initial radiographic images of the adult right-sided BH (before surgery): (a) an upright Chest X-ray left arrow showing air-fluid level, right arrow showing the column air-fluid level in the right hemithorax and left directed arrow showing the column air-fluid level in the descending colon, (b), (c): Coronal sequences of thoracoabdominal CT scan showing herniation of liver (white star), ascending and transverse colon (white empty arrow) into hemithorax with the obstructed site of descending colon (white full field arrow, bird beak sign).

midline laparotomy was performed. The abdominal cavity was filled with fibrin tissue, pus, and fecal matter. There was a perforated descending colon mass. The colon mass was removed, and a Hartman colostomy was performed. The pathology

results revealed a T3N1 moderately differentiated adenocarcinoma of the colon. Unfortunately, the patient died 2 days after the operation. Clinically, death due to septic shock was irreversible.

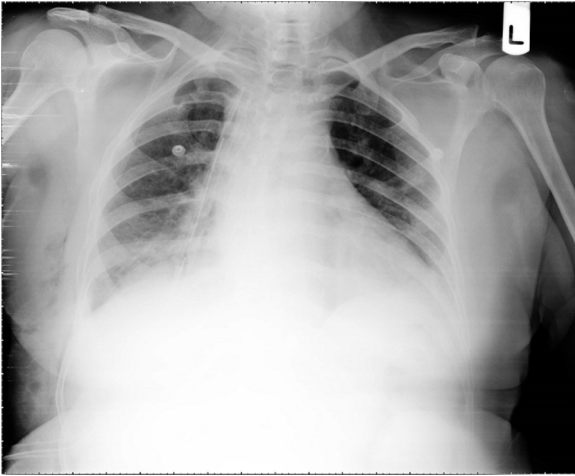


Figure 2. Radiographic image of the adult BH after operation, complete expansion of the right lung.

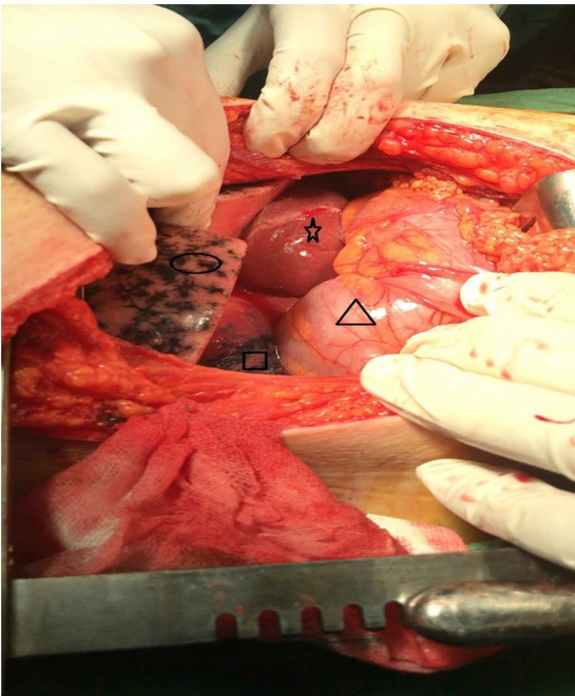


Figure 3. Intra operative (posterolateral thoracotomy) image with no sign of hernia sac. Hepatic flexure of the colon (triangle), right lobe of the liver (star), the right medial lobe of lung (circle), right lower lobe of lung (Square).

Discussion

A diaphragmatic hernia can be acquired (ADH), caused by a high-energy blunt trauma or penetrating thoracoabdominal trauma to the lower chest, or it can be congenital.² As our patient had no history to support a traumatic diaphragmatic hernia, this was more likely a congenital etiology. BH on the right side is extremely rare due to the earlier fusion of the right diaphragm and the protective location of the liver, especially in adults, and <5% are diagnosed after the neonatal period.⁴ An adult Bochdalek hernia (ABH) usually occurs in conditions of increased intra-abdominal pressure, such as pregnancy, labor,

coughing, sneezing, and trauma.³ This patient had some underlying conditions in her history, such as 2 vaginal deliveries and an obstructed colon mass, which could increase intra-abdominal pressure. In ABH, presentation with severe symptoms has been reported in 46% of cases, with 32% of mortality because of visceral strangulation. But symptoms are usually nonspecific and can be intermittent like recurrent abdominal pain, postprandial fullness, vomiting, and respiratory distress.⁵ Due to non-specific signs and symptoms, clinical history and physical examination cannot help in making the diagnosis.⁶ Different imaging modalities including chest X-ray, ultrasound, computerized tomography, and magnetic resonance can be used to build a complete diagnosis. The sensitivity of the chest X-ray is 70% but is not specific enough to exclude the diagnosis of BH in case of a negative result.⁷ On chest X-ray, the hernia shows up as a gas or fluid-filled structure, like in our case (Figure 1). A double-contrast axial CT scan is the most useful imaging study for the diagnosis of DH with the typical findings of fat or soft tissue contour on the upper surface of the diaphragm.⁸ But in our patient, because of the acute kidney injury (AKI) due to prehospital dehydration and evidence of bowel obstruction, we could not use oral and intravenous contrast. So, we decided to take a non-contrast thoracoabdominal CT scan. These are some radiographic features that should have prompted a closer review of the case. As mentioned above, one of the presentations of DHR is a bowel obstruction that can be happened due to bowel incarceration. The patient complained of an inability to defecate and expel gas, as it is shown in Figure 1, the diameter of the transverse colon was increased, intraluminal air was interrupted at the proximal sigmoid, a birds beak sign appeared in the descending colon, and a suspicious wall thickening of the descending colon was seen (Figure 3). All of the Evidence emphasized that the obstructed site was in the descending colon, not in the herniated colon. Unfortunately, before the first operation, our attention was focused on the large diaphragmatic hernia, and we related all the symptoms to the incarcerated hernia, so we made a mistake in the diagnosis of the main disease.

Due to severe complications from content strangulation, surgery is recommended even in cases of asymptomatic hernias.⁶ DH surgery can be performed through the abdominal or thoracic cavity, but in urgent circumstances, open abdominal surgery is recommended.⁷ Although the overall results of both thoracic and abdominal approaches are comparable, as no randomized studies are providing the superiority of either method, the choice of the proper method is based on the surgeon's experience and the patient's condition.⁹ The thoracotomy is beneficial concerning the repair of the hernia orifice, particularly in the case of a right-sided defect like ours. Chin et al. The study recommends a transthoracic approach as it provides better exposure and a more comfortable repair of the hernia sac.¹⁰ This is also advocated by Kilic et al., which performed thoracotomies on 16 patients, all with uneventful recoveries and no

recurrence of symptoms.¹¹ We performed posterolateral thoracotomy, because of the site and the size of a hernia, but considering the cause of a hernia in adults, which is often due to increased intra-abdominal pressure, it seems that laparotomy is preferable to thoracotomy.

In 20% of cases, there is a hernia sac, in contrast to the majority of cases where there is direct communication between the thoracic and abdominal cavities.⁷ It is similar to our finding in the patient, there was direct communication between the right thoracic cavity and abdominal viscera (Figure 3). If a large hernia has been reduced, the intra-abdominal pressure must be intensively monitored postoperatively for early diagnosis of abdominal compartment syndrome.⁷

Conclusion

Adult right-sided BH is very rare. Hence, in adult patients who present with this disease, the underlying cause of its occurrence, which is often in the context of conditions of increased intra-abdominal pressure, should be identified.

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Author Contributions

Study conception and design: ME, MG.; Data Collection: ME, GG, MR; Analysis and interpretation of results: MG, GG, MR; Draft manuscript preparation: ME, GG, MR. All

authors reviewed the results and approved the final version of the manuscript.

Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying clinical images.

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