

# Obstructed descending colon mass pretended with Bochdalek hernia: a case report

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## Research Article

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# Abstract

**Introduction:** Adult Bochdalek hernia is one of the right-sided diaphragmatic hernias that less than 30 cases reported until now.

**Case:** I herein report a 64-year-old female patient who had dyspnea, abdominal pain, and nausea. Primary imaging (thoracic and abdominal CT scan) showed a right-sided diaphragmatic hernia that was contained the liver and right colon. The patient underwent right posterior thoracotomy at first, so the 5\*5 cm diaphragmatic defect was repaired. Due to peritonitis that happened after two days, a midline laparotomy was performed. Finally, it was cleared that the main problem was the obstructed and perforated descending colon mass that was presented with Bochdalek hernia. Unfortunately, she died.

**Conclusion** It is important to determine the reason for the presentation of the symptomatic diaphragmatic hernia in adult patients. It should be considered that an increase of intra-abdominal pressure like the presence of obstructed colon mass can cause it.

## 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 poster laterally (2). A PubMed search showed, less than 30 cases reported that right-sided Bochdalek hernia (BH) contains a colon and liver in adults (3). To the best of my knowledge, this is for the first time that reported 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, dyspnea. The symptoms started two months ago and have been getting worse for the past seven days. She was not passing flatus in the last 24 hours and had not opened her bowels for seven 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 distention. Initial laboratory findings showed impairment of creatinine level. Laboratory findings are summarized base on the timeline in Table 1.

Table 1  
Laboratory finding based on time line

Laboratory data	On admission time	After first 24 hours	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 <sub>2</sub> (mmHg)	51	————	50
HCO <sub>3</sub> <sup>-</sup> (mEq/L)	32		21
HGB: Hemoglobin, WBC: white blood cell, BUN: Blood urea nitrogen, Cr: creatinine, BE: Base -excess			

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 (Fig. 1). 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 (Fig. 2).

One day after admission, the patient's abdominal pain got worse, especially on the right side. So I 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 (Fig. 3). There was no evidence of a hernia sac and a 5\*5 cm diaphragmatic defect was seen. Primary repair of the diaphragm was done with a tension-free, separated, vertical mattress with 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 (Fig. 4).

Two days after the initial operation, urine volume decreased by 0.03 cc per hour, serum creatinine increased, metabolic acidosis developed, level of consciousness decreased, heart rate increased (130–130 per minute) and blood pressure decreased. 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 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. Two days after the operation, the patient died. Clinically, death due to septic shock was irreversible.

## Discussion

A diaphragmatic hernia can be acquired (ADH), that 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 most likely congenital in 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 less than 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; two vaginal deliveries and an obstructed colon mass, which could increase the 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 usually nonspecific and can be intermittent like as, 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 modalities of diagnostic imaging can be used, between which chest x-ray, ultrasound, computerized tomography, magnetic resonance. 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 a gas or fluid-filled structure, like our case (Fig. 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, I could not use oral and intravenous contrast. So, I 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 Figs. 1 & 5, the diameter of the transverse colon was increased, Intraluminal air was interrupted at the proximal of sigmoid, beak sign be appeared in the descending colon, and suspicious wall thickening of the descending colon was seen(Fig. 3). All of this 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

I related all the symptoms to the incarcerated hernia, so I made a mistake in the diagnosis of the main disease.

Due to serious complications from contents 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 cases, 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 with respect to repair of the hernia orifice, particularly in the case of a right-sided defect like as. Chin et al study recommends a transthoracic approach as it provides better exposure and 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). I did posterolateral thoracotomy, because of the site and 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 be 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, Fig. 3. If a large hernia has been reduced, the intra-abdominal pressure must be intensively monitored postoperatively to early diagnosis of abdominal compartment syndrome (7).

## **Conclusion**

Adult BH right is very rare. For this reason, 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.

## **Declarations**

### **Conflict of interests**

None declared.

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### **Patient Consent for publication**

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this

journal.

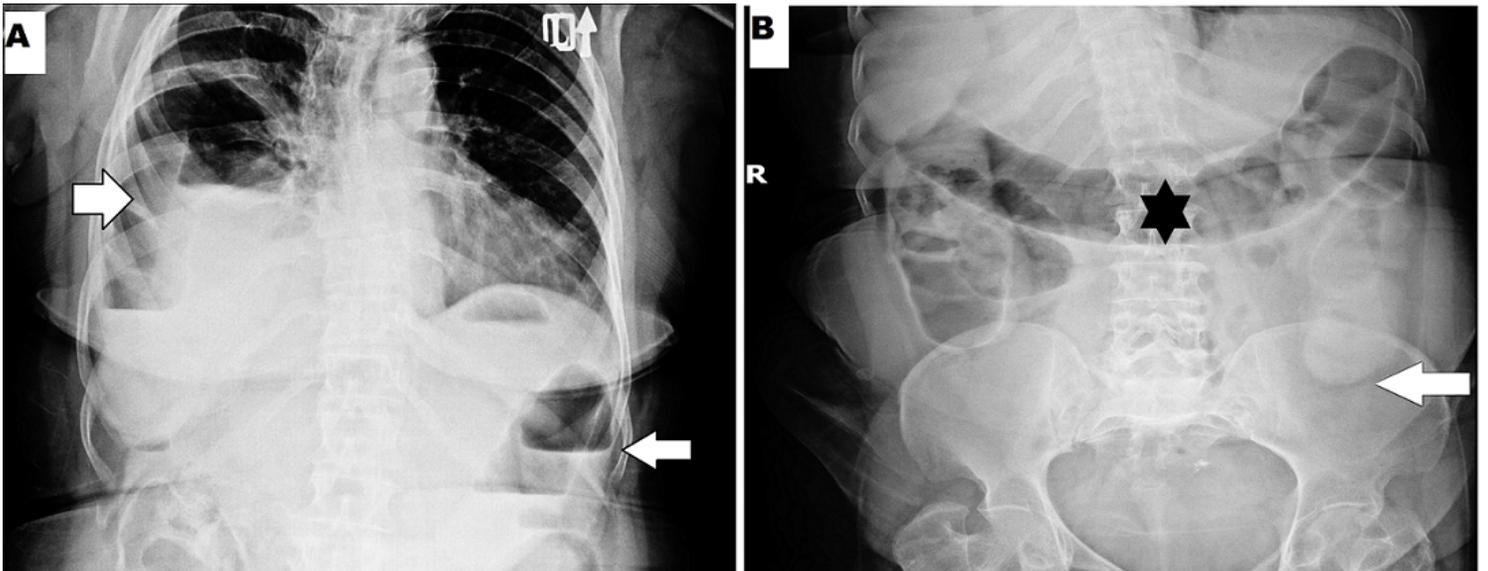
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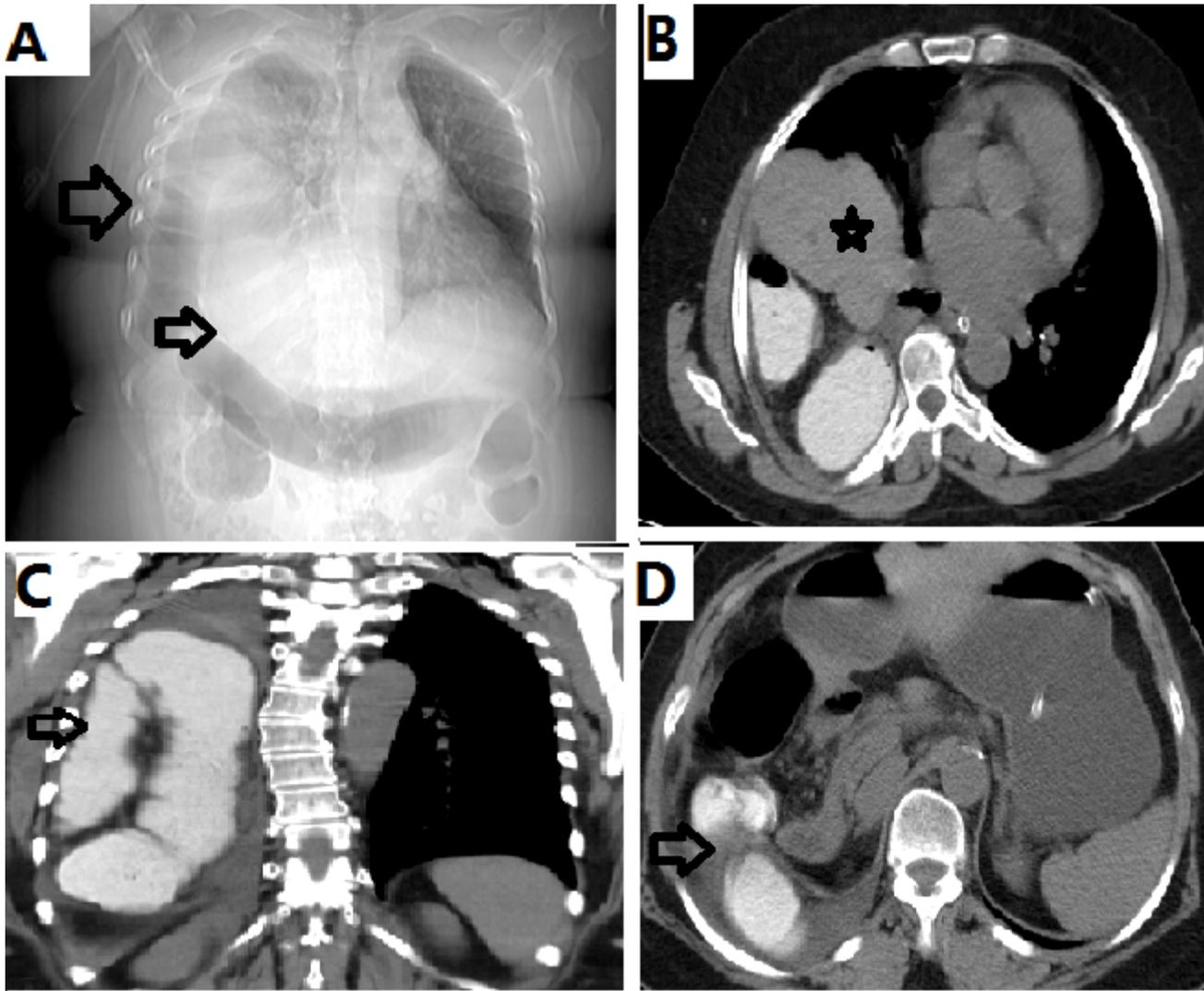
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## Figures



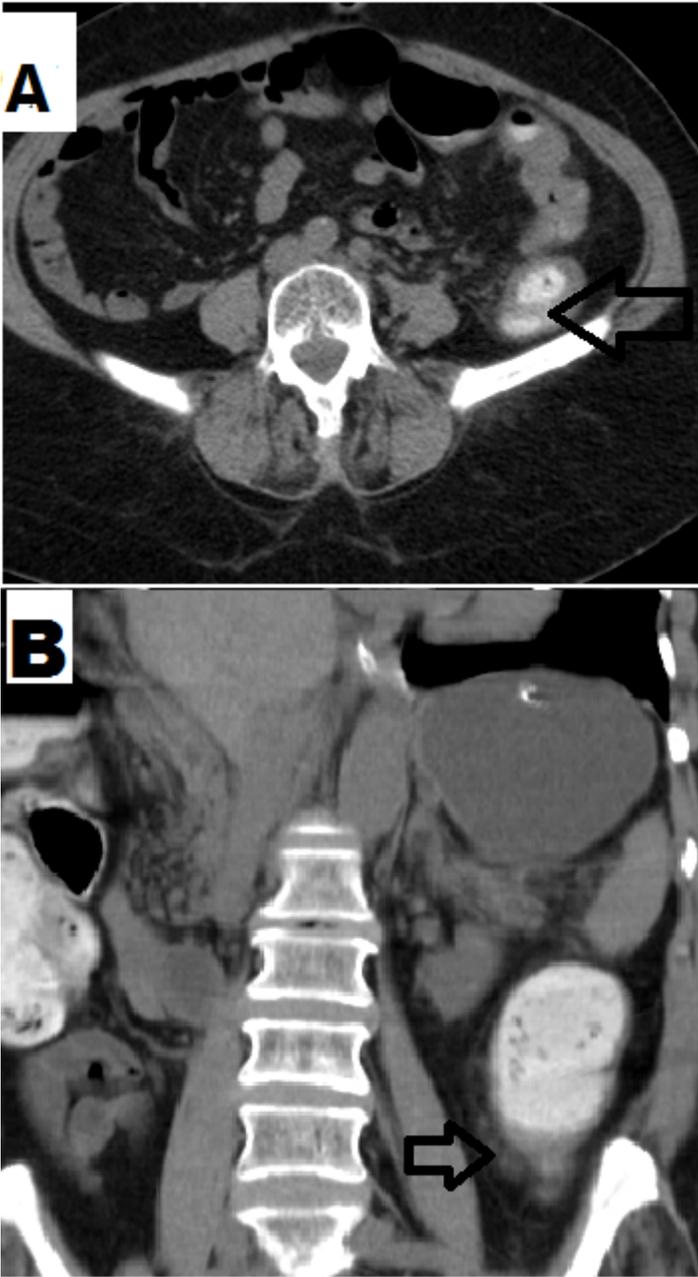
**Figure 1**

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 air-fluid level in the abdomen. B: supine abdominal X-ray, star demonstrated increased transverse colon diameter, arrow showing cut point in the descending colon.



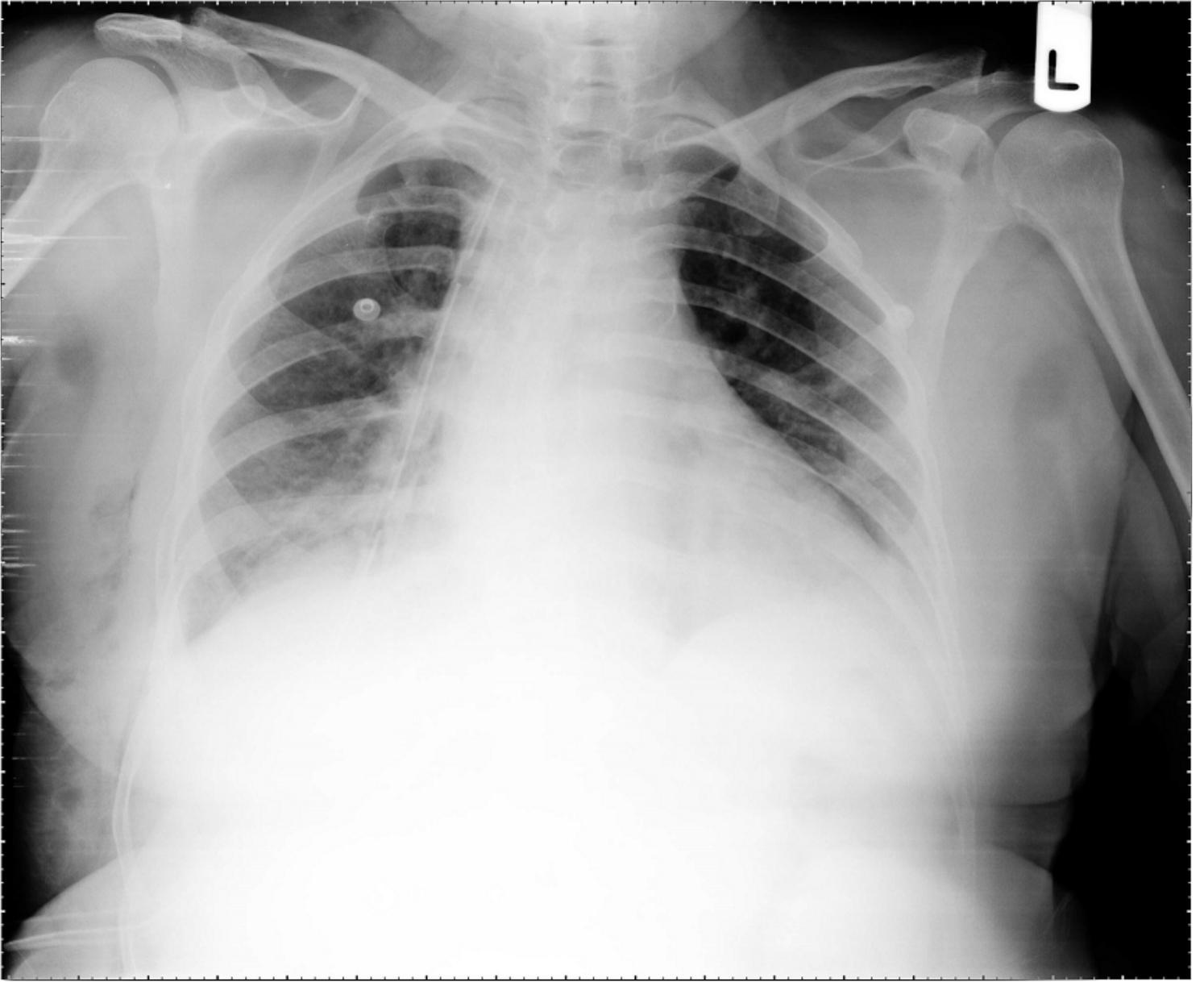
**Figure 2**

A: Thoracoabdominal X-ray, large arrow showing herniation of ascending colon and a small arrow showing herniation of liver into right hemithorax. B (mediastinal view), C (lung view), axial sequence of computed tomography (CT) scan of the abdominal CT scan showing herniation of liver (star), ascending and transverse colon into hemithorax. D, Coronal sequence of thoracoabdominal CT scan showing herniation of colon (arrow) into the hemithorax with the distended large bowel .E, Axial CT demonstrating posterolateral right-sided diaphragmatic defect (arrow)



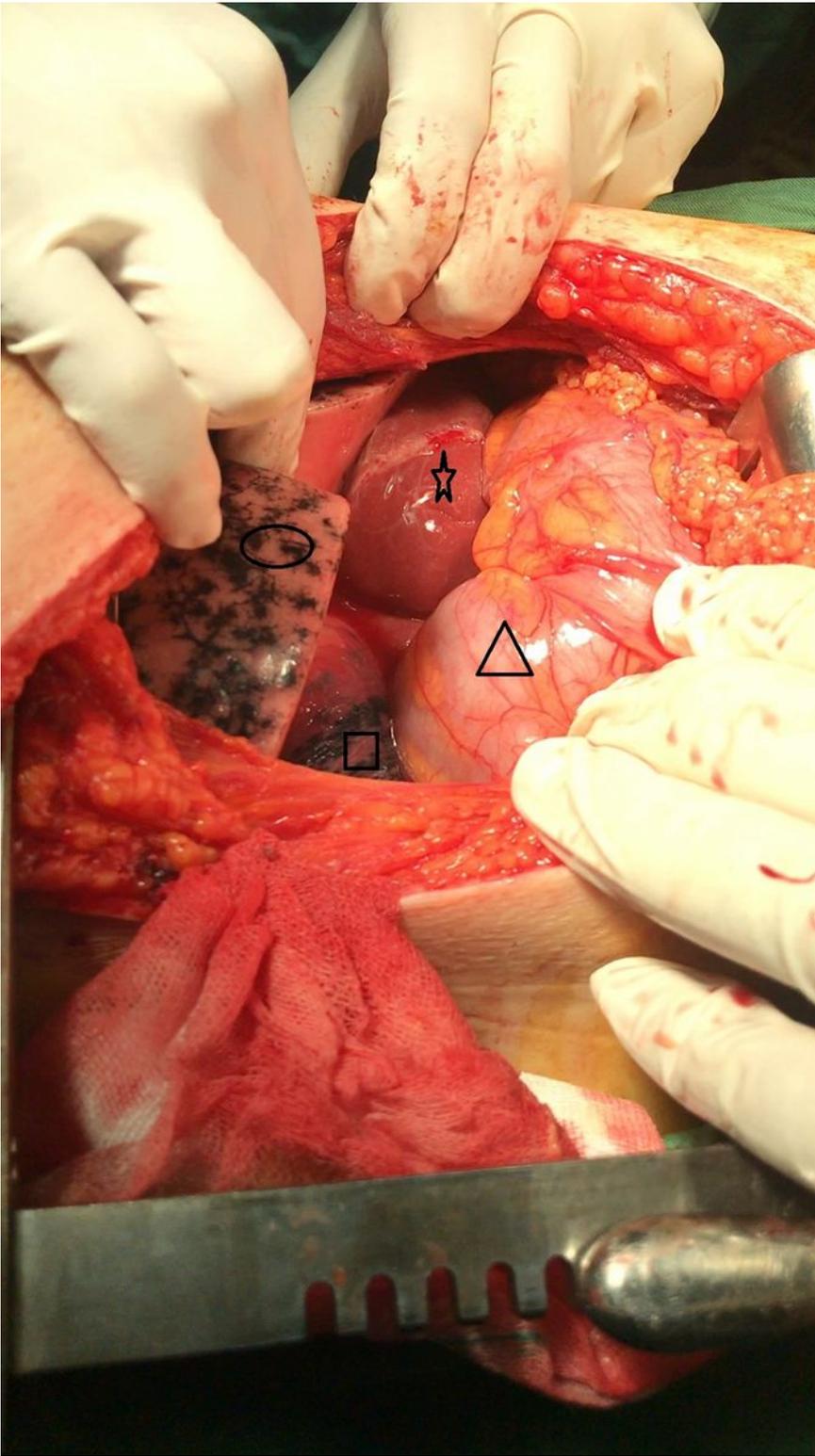
**Figure 3**

CT scan showing the wall thickening of colon and beard sign that revealed obstructed site in the colon; A and C (axial sequence), B and D (coronal sequence)



**Figure 4**

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



**Figure 5**

Intra operative (posterolateral thoracotomy) image.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).