CASE REPORT

A Rare Case of Adult Right-sided Bochdalek Hernia with Multiorgan Herniation into Right Thorax: A Case Report

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Abstract

Congenital diaphragmatic hernia (CDH) is a severe deformity usually diagnosed in the immediate postnatal period and early infancy. It is rarely diagnosed later in life and even rarer in asymptomatic adults. Bochdalek hernia (BH) is a posterolateral defect in the diaphragm and is more often present on the left side. We present a case of a 40-year-old gentleman who was diagnosed with right-sided congenital BH during radiological studies. Diagnosing a CDH, which is asymptomatic till adulthood, is quite challenging. Strangulation and entrapment of the abdominal viscera are the most common complications; therefore, surgical repair is advised for all adult CDH patients. Operative approaches can be open repair or using minimally invasive methods, i.e., laparoscopic or robotic surgery. The reinforcement of diaphragm repair with mesh is subjective and the surgeon discretion's depending on the size of the defect. In our case, we went ahead with an open approach – reduction of hernial contents into the abdomen followed by primary repair of right BH with reinforcement by a composite mesh. This case report highlights the presentation of a rare symptomatic right-sided BH in adulthood, and a high index of clinical suspicion is required for the diagnosis of BH due to the failure of routine imaging studies for detection and reporting regularly.

Keywords: Adult Bochdalek hernia, Case report, Composite mesh, Multiorgan herniation, Repair.

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Introduction

Diaphragmatic hernia (DH) can be congenital or acquired, with the incidence of 1 in 3,000-5,000 live births.[1] Right-sided DH is less common as compared to left-sided DH. The presence of liver and early closure of the pleuroperitoneal hiatus on the right prevents herniation of major abdominal organs into the thoracic cavity, and thus, right-sided DH is rare. The CDH occurs as a result of an improper fusion of the muscular and central tendinous part of the diaphragm during development, leading to weakness and causing the intra-abdominal contents to herniate into the thorax.[1] Patients with CDH are usually diagnosed in the immediate postnatal period or early infancy. A few patients may present later in life as asymptomatic adults and are diagnosed during evaluation for other unrelated symptoms. We report a 40-year-old gentleman with recent onset progressive dyspnea, diagnosed with symptomatic right-sided congenital BH hernia, and its management.

Case Presentation

A 40-year-old gentleman presented to outpatient department (OPD) with a history of nonproductive cough, gradually progressive shortness of breath, and pain in the right upper abdomen for 15 days. There was no history of trauma to the chest or abdomen, hemoptysis, similar complaints in the past, or hospitalization during childhood, and other comorbidities. Clinical examination revealed reduced chest expansion on the right side, dull note on percussion over the right lower zone, absent breath sounds in the right middle and lower zones, with the presence of gurgling sound on auscultation in the right lower zone. Left-sided chest and abdominal examination was found to be normal. Routine blood investigations, ECG, and transthoracic echocardiogram were normal.

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Conflict of interest: None

Patient consent statement: A written informed consent was obtained from the patient for the publication of details, which can include photographs and/or videos and/or case history to be published in any printed/online journals.

Radiological Investigations

A chest X-ray posteroanterior view (PAV) revealed heterogeneous opacity in the right hemithorax in the middle and lower zones, obscuration of the right hemidiaphragm and right cardiac border (Fig. 1). Further, contrast-enhanced computed tomography scan (CECT-chest and abdomen) confirmed a defect in right hemidiaphragm (65 mm) with herniation of bowel, right kidney, gallbladder, and right lobe of liver into right lower thoracic cavity. There was passive collapse or atelectasis of the right lower lobe of the lung and the lateral segment of the right middle lobe of the lung (Figs 2 to 4).

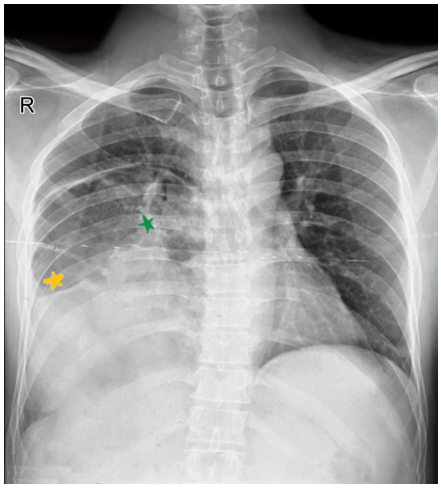

Fig. 1: Chest X-ray showing: Heterogenous opacity, haustrations (yellow star), and an air fluid level (green star)

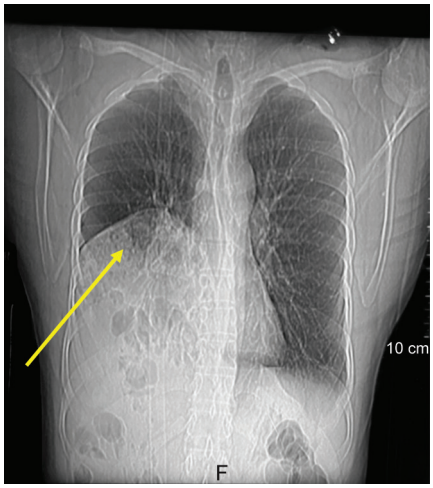

Fig. 2: CT Scanogram showing: Right hemidiaphragm raised with mottled lucencies suggestive of bowel loops

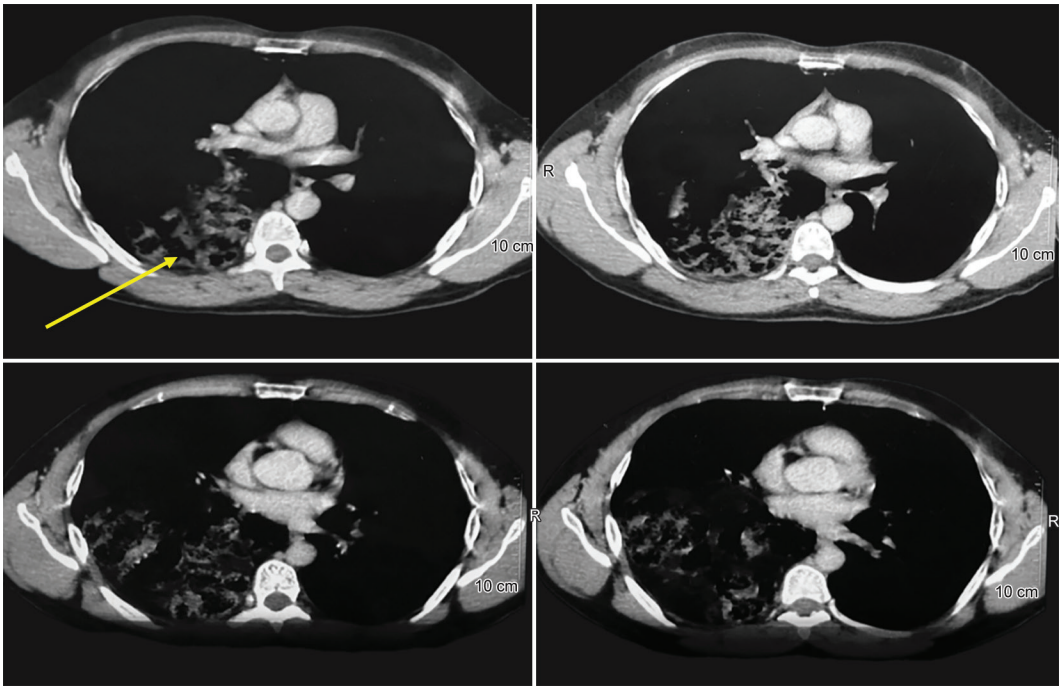

Fig. 3: Axial section of CT chest and abdomen: In the right middle and lower zones, heterogeneous opacities are seen, suggestive of bowel loops

Surgical Management

The authors preferred open surgical repair through a right subcostal incision. Intraoperatively, a defect of size (8 × 6) cm was noted in the posterolateral aspect of the right hemidiaphragm (tendinous and muscular part), with the margins of the defect appearing thin and atrophied with adhesions with the hernia contents (Fig. 5). Right kidney, proximal part of transverse colon, significant part of right lobe of liver, gall bladder, and omentum were seen herniating into right thoracic cavity and displacing the right lung cranially. The right kidney with the ureter was abutting the right border of the heart. Meticulous dissection was done with an ultrasonic energy device, and the contents were reduced intra-abdominally. The right lung pleura was found intact, followed by primary repair of the edges of the BH interrupted sutures with 2-0 polydioxanone (PDS) with reinforcement by a composite mesh (Fig. 6).

Postprocedure, right lung expansion was normal, and no pneumothorax was noted, as confirmed by intraoperative ultrasound chest. The patient was monitored in the ICU, extubated on POD-4, and an ultrasound-guided pleural tap was done on POD-4 for moderate right-sided effusion and discharged on POD-8, doing well for one year (Fig. 7).

Discussion

The first reported case of congenital diaphragmatic agenesis CDH in an adult was documented by Tzelepis et al. in 1988. The patient had a chronic infiltration of the left lower lobe, which was later determined to be total agenesis of the left hemidiaphragm.[2]

Right-sided CDH is uncommon, accounting for only 8–10% of cases, due to the presence of the liver and the early closure of

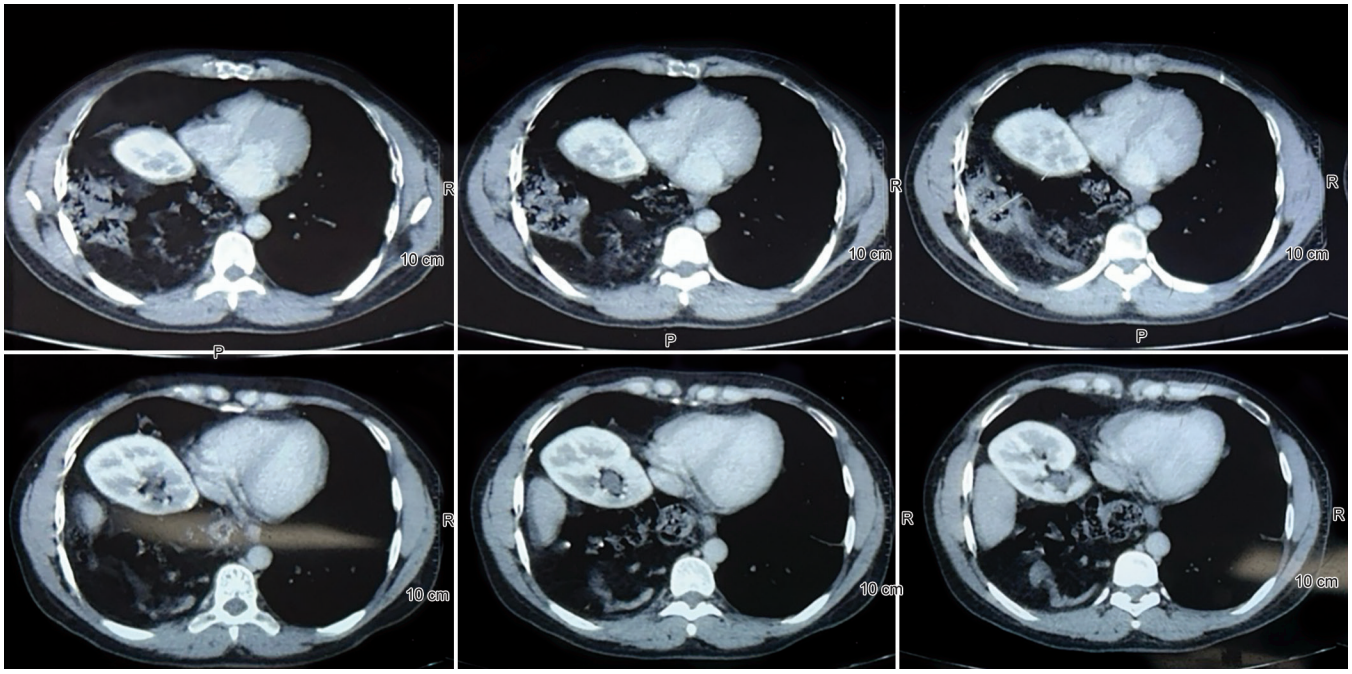

Fig. 4: Axial section of CT chest and abdomen: Right kidney seen in the right paracardiac region above the level of the right lobe of liver

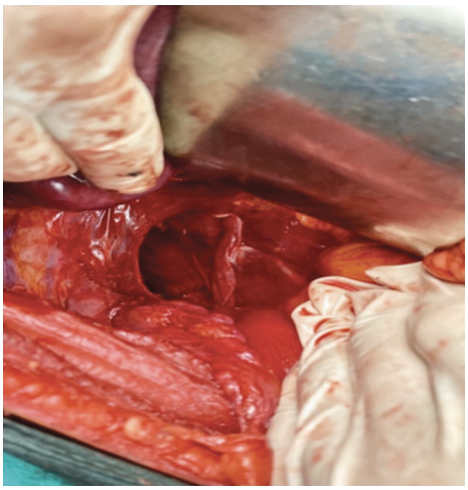

Fig. 5: Intraoperative picture showing the diaphragmatic defect after reduction of contents into the abdominal cavity

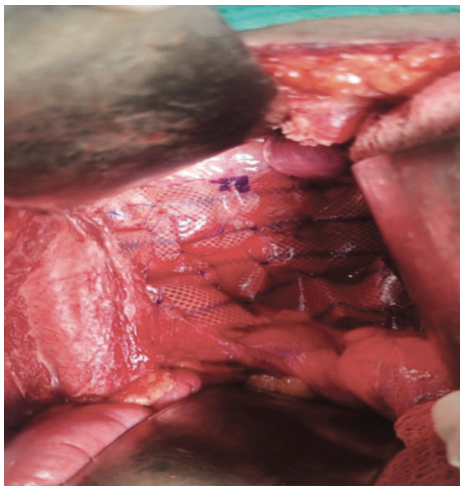

Fig. 6: Repair of diaphragmatic defect with a composite mesh

the pleuroperitoneal hiatus on the right.[3,4] By 8–10 weeks of age, the septum transversum and pleuroperitoneal membranes have fused, separating the abdominal and thoracic cavities; failure of this fusion results in a posterolateral DH [also known as Bochdalek hernia (BH)].

Anteromedial hernia is termed as Morgagni hernia (MH), which is diagnosed in early infancy and has a significant mortality of up to 38–62%.[5,6] The patients diagnosed with MH might have associated other congenital anomalies or absence of them, thereby affecting survival along with cardiopulmonary functions and reserve.[6]

The incidence rates of symptomatic BH are 0.02–0.03%, with females having a greater incidence than males, whereas the overall reported frequency of asymptomatic BH in adults is 0.17–6%. The most common contents are the colon (63%), stomach (40%), omentum (39%), and small bowel (28%). The kidney, spleen, and tail of the pancreas are the unusual contents.[7,8]

Adults with BH may experience a variety of symptoms, including chest discomfort, dyspnea, stomach aches, dysphagia, and postprandial fullness. Surgical intervention is essential in symptomatic patients with dyspnea, organ herniation, or strangulation to prevent deterioration of pulmonary function.[9] Hernias can be treated openly (laparotomy, thoracotomy, and rarely sternotomy) or minimally invasively (thoracoscopic, laparoscopic, and robotic).[5] We used an open abdominal approach because of the huge defect size and the presence of many visceral and retroperitoneal organs in the thoracic cavity.

A tension-free polypropylene or expanded polytetrafluoroethylene mesh can be used for diaphragmatic restoration

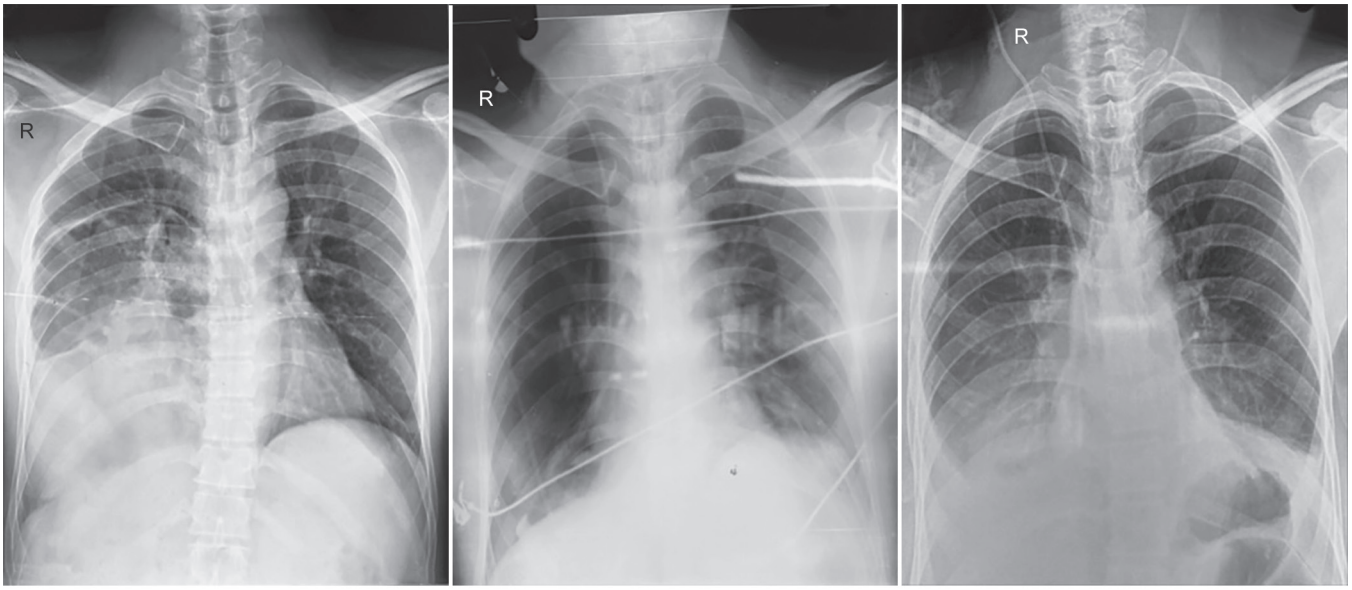

Fig. 7: Full inflation of the right lung seen in the immediate postoperative period, and right-sided pleural effusion noted on postoperative day 4

once the herniated organs have been repositioned into the abdominal cavity.[6,7,10] Interrupted sutures with 2-0 PDS (Reider technique) are used to repair defects smaller than 5 cm, while a tension-free mesh hernioplasty is used to repair defects larger than 5 cm.[11]

The present case is rare due to herniation of multiple intraperitoneal and retroperitoneal organs into the right thoracic cavity, leading to progressive respiratory symptoms and its surgical management.

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