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Rare Case of Nontraumatic Right Sided Bochdalek Hernia in Adult: A Case Report

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Abstract: ***Understanding and acknowledging that some diaphragmatic hernias may remain clinically silent till adulthood when they present as life-threatening surgical emergency. The percentage of right-sided spontaneous diaphragmatic hernias reported is very small compared with those found on the left side and that too in the absence of trauma is very rare in adults. Owing to their rarity and varied presentation, these hernias can pose a diagnostic challenge. A sceptical approach, combined with thorough physical examination and the correct interpretation of the chest X-ray, are very important in diagnosis. In light of this information, here we review a case of 75-year-old female with incidentally detected right sided nontraumatic bochdalek hernia who presented with abdominal pain and vomiting and was successfully repaired by laparotomy.***

Keywords: Bochdalek Hernia, Intestinal Obstruction, Pleural effusion

1. Introduction

Diaphragmatic hernia is defined by intra-abdominal contents extending into the thoracic cavity through a defect in the diaphragm. They are commonly classified as either congenital or acquired and traumatic or non-traumatic. By far the greatest number reported in adults was due to trauma. Bochdalek hernia is a type of congenital diaphragmatic hernia that typically presents in childhood. As few as 100 cases have been reported in the literature with fewer than 20 cases of right-sided Bochdalek hernia.[1] Such hernias have been attributed to physical exercise, coughing, vomiting, defecation and rarely as a complication of labour and delivery. Surgical repair is mandatory to prevent its potential devastating morbidity and mortality. Traditionally, it has been repaired by laparotomy or thoracotomy, or both. With the recent advent of minimally invasive surgery, laparoscopic repair has become feasible.

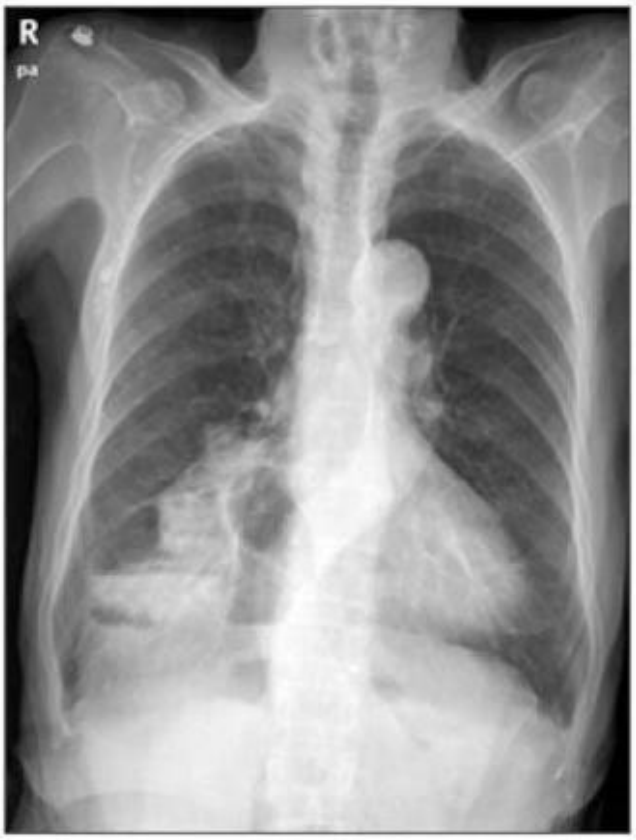
2. Case Report

A 75-year-old female, with hypertension presented to our surgery department with history of progressive right upper abdominal pain, colicky, non-radiating and severe in nature, no relieving or exacerbating factors, associated with vomiting for 2 days. Vomiting was non bilious and non-projectile. Prior to her visit, she was prescribed prokinetics in a private hospital, but these were not effective. There she was also advised a CT scan. She denied any cough, shortness of breath or chest pain. She had been hospitalised eight months before for dengue and right pleural effusion. She denied any history of trauma in the past. No history of smoking.

At the time of the visit, patient was conscious and cooperative. A check of the patient's vital signs revealed the following: systolic/diastolic blood pressure of 140/80 mmHg, heart rate of 102/min, respiratory rate of 18/min, and body temperature of 98°F. On auscultation of chest, air entry was found to be decreased in right lung in middle and lower zones. Also some sluggish bowel sounds were appreciated over right lower chest. Her abdomen was soft with generalised distension, tenderness presents over right upper and lower quadrant areas without any guarding or rigidity.

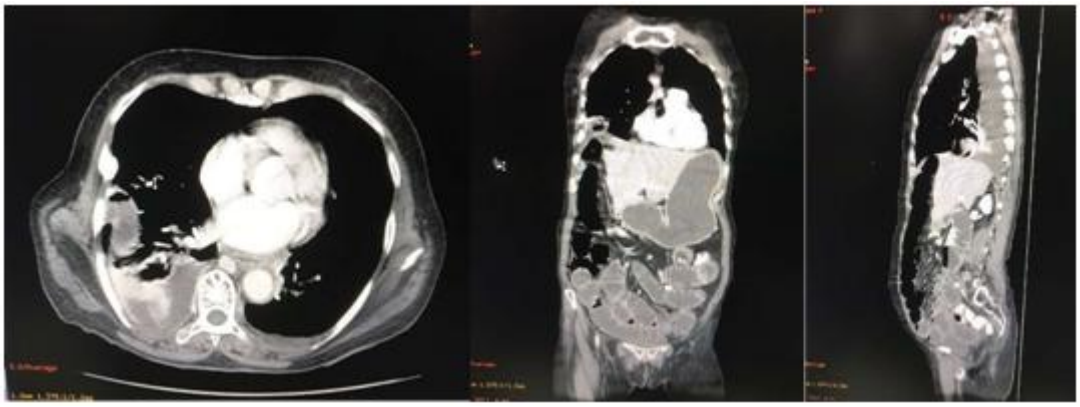
The routine blood investigations were done, including electrolytes. Except for a mild rise in WBC count and a decrease in electrolyte levels, other reports were normal.

Patient was advised nil by mouth, a nasogastric tube put in and plain x-ray and USG were done.

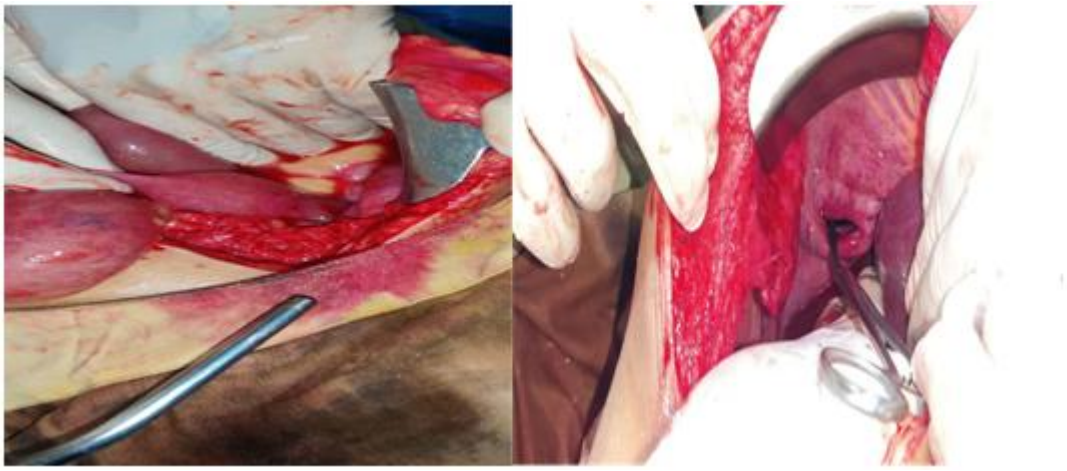


Chest radiograph revealed that some intra-abdominal contents had entered right side of the thoracic cavity with gas shadow above right diaphragm. Usg was suggestive of multiple dilated bowel loops at right lumbar region and a single peristaltic bowel loop above right hemidiaphragm.

There was right side mild pleural effusion also. Both investigations were suggestive of intestinal obstruction due to right diaphragmatic hernia. CT (Abdo+ pelvis +chest) was suggestive of right diaphragmatic hernia with intestinal obstruction with right side moderate and left side mild pleural effusion. Diaphragmatic defect of size approximately 2.6× 2 cm (AP×TR).



Our patient was taken for an emergency laparotomy. On exploration, a 10 cm sized segment of ileum was found to be herniating through an approximately 3×3 cm sized posteriorly placed diaphragmatic rent with no hernial sac. No significant adhesions were found and hernial contents were reduced back into abdomen. Diaphragmatic defect was closed primarily in two layers. A chest drain was inserted to the right thoracic cavity during the procedure. Drains were placed. Minimal intraoperative bleeding occurred, and the total duration of the operation was 120 minutes.



The nasogastric tube was removed on third day after the operation and eating was resumed. A follow up chest x-ray was done and showed that the right lung was fully re-expanded. The chest drain was removed on postoperative day 5. A follow up usg was done on post operative day 11 that was suggestive of approximately 10mm strip of collection surrounding stitch line. This was drained by removing single stitch. The collection was negative for bacterial culture. The patient was discharged 16 days after the operation. She has remained symptom free since then.

3. Discussion

The foramen of Bochdalek is a 2cm x 3cm opening in the posterior aspect of the diaphragm in the foetus, through which the pleuroperitoneal canal communicates between the pleural and peritoneal cavities. This canal normally closes by the 8th week of gestation. Failure or incomplete fusion of the lateral (costal) with the posterior (crural) components of the diaphragm leads to the development of Bochdalek hernia. Bochdalek hernia primarily manifests in neonates and children. It is rare in adults and accounts for about 0.17% to 6% of all diaphragmatic hernias and was first described by Vincent Alexander Bochdalek in 1848. Most Bochdalek hernias are diagnosed in children who present with acute pulmonary symptoms.

However, DH may present as an acquired type also. When acquired, mostly they are a result of either blunt or penetrating trauma. Acquired DH can also be spontaneous or iatrogenic. Iatrogenic acquired DH is mostly seen as a complication of pediatric liver transplants and liver resection.[2] Other noted and documented episodes of ADH post-surgery within case studies include post Nissen fundoplication, left colectomy, adrenalectomy, laparoscopy-assisted total gastrectomy, nephrectomy and partial resection of the left lung using thoracoscopic surgery. Most of the hernias tend to occur on the left side of the diaphragm. This tendency is likely due to the right hemidiaphragm being protected by the size of the liver beneath it and also because closure of the right pleuroperitoneal hiatus occurs earlier.[3]

It is important to consider DH as part of an early differential

diagnosis, as a delay in diagnosis increases the risk of strangulation, perforation, and pulmonary or vascular compression. When symptomatic in adults, they present with symptom of thoracoabdominal complex. This consists of distinctive gastrointestinal and cardiorespiratory features.

The abdominal manifestations of this acute complex include sudden excruciating upper abdominal pain and tenderness, nausea and vomiting, and gastrointestinal bleeding or shock or both. The thoracic portion of the complex is characterized by severe lower chest or substernal pain with radiation to the neck or shoulder. Dyspnea and cyanosis result from a mediastinal shift produced by massive distention from herniated viscera or pleural effusion or both. Our patient presented with typical features abdominal complex - abdominal pain and vomiting.

It is important to recognize four stages in the development of strangulating diaphragmatic hernia: (1) asymptomatic; (2) minimal symptoms; (3) obstruction; and (4) strangulation. In our case, the patient presented in stage 3 i.e. with intestinal obstruction. The life- threatening complications of diaphragmatic hernia include strangulation, haemorrhage, viscus perforation, pleural fistula, and empyema.

A hernia sac has been reported to be present in 10 to 38% of such cases.[4] Long-term survival may be due to the persistence of a pleuroperitoneal sac, and the rupture of the sac in adult life may trigger the characteristic symptoms. However, in our patient, no such hernial sac was present.

Apart from history or clinical manifestations, imaging is vital for diagnosis of diaphragmatic hernia. The commonly used imaging modalities are chest radiograph, usg, mri and CT scan. Computed tomography (CT) being the modality of choice.[5] The reported sensitivity of the CT scan in diagnosing diaphragmatic hernia ranges from 33% to 83%.[5] On chest X-ray, a Bochdalek hernia can show up as gas and fluid-filled viscera. Typical findings on a contrast enhanced CT are fat or soft tissue contour on the upper surface of the diaphragm and pleural effusion. Other imaging modalities include upper gastrointestinal contrast study which can exclude malrotation but may miss complications and laparoscopy. The diagnosis in our patient was established by a combination of chest Xray, usg and CT. Another characteristic of a Bochdalek hernia is its posterolateral location. These findings were also present in our patient.

The most common structures to enter the thoracic cavity are the stomach, colon, greater omentum, small intestine, spleen, and liver. Herniation of stomach on right side is extremely rare. Management of a Bochdalek hernia includes reducing the abdominal contents and repairing the defect through a laparotomy or thoracotomy. Traditionally, the most sensitive diagnostic modality for diaphragmatic injuries has been laparotomy which has resulted in unnecessary laparotomies in the past. Laparoscopy is now an alternative method for the diagnosis and treatment of DH. Frantzides[6] reported the first successful laparoscopic repair of a diaphragmatic hernia in 1994. Right-sided defects are traditionally dealt with by a thoracic or thoracoabdominal approach because of the presence of the liver.

The debate on whether synthetic mesh or primary closure produce the safest and most durable repair for diaphragmatic hernia has yet to be decided. Laparoscopic primary repair of diaphragmatic hernia is technically demanding when the defect communicates with the esophageal hiatus or is very close to pericardium. The placement of synthetic mesh repair in close proximity to the esophagus runs the risk of erosion. For a sizable hernia sac after reduction, sac ligation followed by excision should be performed to reduce the chance of loculated fluid collection. In our patient, this wasn't required. Conversion to open surgery is mandatory when ventilation difficulty is encountered.

4. Conclusion

We report a rare case of a right-sided Bochdalek hernia in an adult who was treated via laparotomy. Diaphragmatic hernias in adult, though a rare entity should be listed in the differential diagnosis of acute abdomen. When diagnosed timely such hernias can be managed surgically.

Conflict of interest: Nil declared

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