



## Management of Incidental Bochdalek Hernia in An Asymptomatic Adult: A Case Report

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### ABSTRACT

*Bochdalek hernia is a type of Congenital Diaphragmatic Hernia (CDH) that typically presents in childhood. It rarely occurs in adults and most of them are asymptomatic. In this article, we report a case of a 30-year-old male with left-sided Bochdalek hernia who was incidentally diagnosed on chest radiograph. His chest radiograph showed features suggestive of left-sided diaphragmatic hernia, which was confirmed using contrast enhanced Computed Tomography (CECT) of chest and abdomen. The patient underwent left thoracotomy, wherein an 8x10 cm postero-lateral diaphragmatic defect with herniation of the small bowel, spleen, part of stomach, and colon with no peritoneal sac through the opening was found. The contents were reduced into the peritoneal cavity, although a part of omentum had to be sacrificed due to loss of domain and to achieve a tension free repair. The diaphragmatic defect was closed with Dacron patch and sutured to diaphragm with non-absorbable sutures.*

**Keywords-** Bochdalek hernia, Congenital diaphragmatic hernia, Loss of domain (LOD) hernia, Dacron patch, Tension free repair.

### INTRODUCTION

Asymptomatic Bochdalek hernia is a rare entity in adults. It is the most common congenital posterolateral congenital diaphragmatic hernia. Although congenital diaphragmatic hernias presents as life threatening respiratory compromise in newborns, its detection in children and adults has been reported<sup>[1]</sup>. In this case report we emphasis early surgical correction of incidentally detected Bochdalek hernia in an adult, rather than waiting for appearance of symptoms or complications to develop. A proper

preoperative workup and bowel preparation prior to surgery is essential in treatment of such type of hernias with loss of domain (LOD).

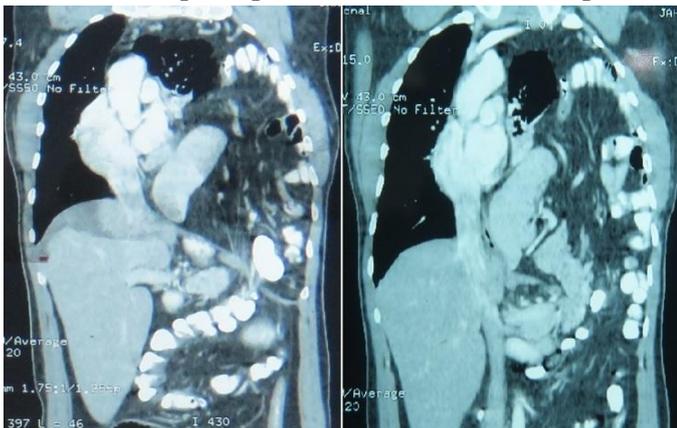
### CASE REPORT

A 30-year-old previously healthy male patient was referred from Chest medicine department with incidental postero-anterior chest X-ray showed fundic gas above the left hemidiaphragm with mediastinal shift to right side. There was no history of thoracic or abdominal trauma. There were bowel sounds audible on the left side of the chest. Contrast

enhanced Computed tomography confirmed a left-sided diaphragmatic hernia with peritoneal contents in the left side of the chest (Fig. 1).

### Pre-Operative Preparation

In view of large hernia with mediastinal shift to opposite side and future possibility of development of complications like intestinal obstruction, strangulation, visceral perforation, a decision for its elective repair was justified. Pulmonary function tests, cardiac and pre-anaesthetic workup necessary for single lung ventilation were done. Patient was kept on liquid diet two days prior to procedure and a mechanical bowel preparation was administered, in anticipation to loss of right of domain and in order to accommodate contents of a large hernia to be reduced into the abdomen. Written Informed Consent was obtained from the patient for the procedure and the subsequent publication of this case report.



**Fig. 1** Contrast enhanced CT showing spleen, bowel and mesentery within left hemithorax

### Anaesthesia

A thoracic epidural was inserted for maintaining analgesia during postoperative period. With rapid sequence induction, total intravenous anaesthesia and single lung ventilation using left sided double lumen tube, patient underwent left thoracotomy.

### Operative Findings

Herniation of the small bowel, spleen, part of stomach, omentum and transverse colon were seen in the pleural cavity without a peritoneal sac (Fig. 2). A defect measured about 8x10 cm posterolateral aspect of left hemi-diaphragm with well defined

borders was found. The left lung was compressed and atelectatic, which expanded completely on manual positive airway pressure.

### Procedure

The herniated contents were carefully reduced to the peritoneal cavity through the hernia defect. There were no ischemic changes of the bowel, stomach and spleen. Although herniated contents were carefully reduced to peritoneal cavity, we had to sacrifice some part of omentum due to inability to reduce it back into the abdomen in order to make a tension free patch repair. Diaphragm was repaired with a Dacron patch using interrupted polypropylene sutures (Fig. 3). Two chest tubes were inserted at the end of procedure followed by thoracotomy closure. Patient received ventilator support for one day. He was gradually started on oral diet after he was weaned off from ventilator. A close observation was kept for development of high intra-abdominal pressure and subsequent abdominal compartment syndrome. Postoperative recovery was uneventful and left lung fully expanded. The patient was discharged and is now on regular follow-up.



**Fig. 2** Small bowel seen through left thoracotomy incision



**Fig. 3** Dacron patch sutured to left hemi-diaphragm with interrupted polypropylene sutures

## DISCUSSION

Vincent Alexander Bochdalek, Czech anatomist and professor first reported herniation in the posterolateral region of the diaphragm in 1848, referred to as 'Bochdalek hernia' <sup>[1],[2]</sup>. The hernia defect results from failed closure of the pleuro-peritoneal canal, during 8th to 10th week of gestation primitive. It is a common congenital anomaly, occurring in approximately one in 3000 live births, but is extremely rare to be found in adults <sup>[2], [3]</sup>. Pulmonary hypoplasia may occur if hernia formation precedes lung development and present with severe respiratory compromise at birth. Adults present with symptoms, such as chronic dyspnoea, chest pain and pleural effusion or present as acute emergency due to complications like bowel obstruction, strangulation and perforation. In adults, the lung in most cases develops normally and therefore the disorder is incidentally detected on chest X-ray as happened in our case <sup>[1]</sup>. Size of the hernia and its contents may differ in each case. Imaging modalities such as plain chest/abdominal radiographs, ultrasound, magnetic resonance imaging and Computed Tomography can be used for diagnosis. Chest CT has well established role to diagnose hernia and focal defects in the diaphragm <sup>[3]</sup>. Bochdalek hernia repair can be performed via trans-thoracic and trans-abdominal; or a combined thoraco-abdominal approach, depending on the clinical presentation. The trans-abdominal approach is generally preferred in cases of intestinal obstruction or strangulation <sup>[1]</sup>. The present case highlights the importance of early elective surgical intervention to correct the defect once a diagnosis has been made in an asymptomatic patient, particularly since delay in treatment can result in significant morbidity and mortality. Small Bochdalek hernias can be repaired with interrupted non-absorbable suture or use of synthetic mesh or Teflon/Dacron patch to reinforce the repair. Large defects in diaphragm like the one in our case should be repaired with use of prosthetic material (dual layer composite mesh/Teflon sheet/Dacron patch) of appropriate size sutured to edge of diaphragm with interrupted non-absorbable sutures. Laparoscopic

repair and thoracoscopic repair has also been described in the literature <sup>[3]</sup>.

A tension free approach towards repair has to be adopted to prevent recurrence since diaphragm is a dynamic muscular structure which moves with each respiratory cycle, coughing and with changes in intra-abdominal pressure <sup>[3]</sup>. A proper preoperative workup and anticipation of LOD with subsequent inability to fit herniated contents back into abdomen should be discussed thoroughly prior to surgery, in order to prevent post operative complications of high intra abdominal pressure leading to abdominal compartment syndrome, an open abdomen and recurrence of hernia <sup>[4]</sup>.

## CONCLUSION

Adulthood left-sided Bochdalek hernias are extremely rare. Few cases remain asymptomatic for a long period. Long standing large hernias are tackled via thoracotomy approach. Preoperative bowel preparation and use of prosthetic material for repair prevents tension over sutures, and subsequent prevention of recurrence of hernia. This is crucial in the management of such large hernias with loss of domain (LOD). Although asymptomatic, elective surgical intervention to correct the defect has to be contemplated at earliest, once a diagnosis is made. As delay in doing so reduces the chances of planned repair and exposes the patient to a significant risk for complications with subsequent mortality.

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