

## Case Report

# A rare clinical entity of asymptomatic adult bochdalek hernia

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### ABSTRACT

Bochdalek hernia (BH) is the commonest congenital diaphragmatic hernia, caused by the failure of the posterolateral diaphragmatic foramina to fuse properly. It is extremely rare in adults and accounts for 5-10%. Presenting a case of 48 years female with complaints of dry cough and left chest pain for 1 week. Diminished breath sounds and abnormal gurgling sounds heard on auscultation of left chest wall. X-ray chest showed elevated left hemi diaphragm and gastric bubble. Computed tomography (CT) chest revealed left diaphragmatic hernia with splenic flexure, transverse colon, mesocolon, spleen and upper pole of left kidney as content and atelectasis of left lung lower lobe. Patient underwent laparoscopic repair of hernia with mesh plasty. Intraoperatively, the contents were reduced into the abdominal cavity and left lung expansion noted. The defect of size 6×10 cm in the left diaphragm was sutured and composite mesh placed. Post-operative chest x-ray showed expanded left lung. On follow up of patient after 2 weeks and 1 month, patient was asymptomatic. BH in adults is an uncommon. The contents can be reduced via thoracic or abdominal approach, with abdominal approach having easier access. With the advent of minimal access techniques, delineating clear anatomy, more working space, early recovery, and early return to home and work is possible. Thus, laparoscopic repair of adult diaphragmatic hernia is a safe and effective modality of surgical treatment.

**Keywords:** Adult laparoscopic repair, Asymptomatic, Bochdalek hernia, Congenital diaphragmatic hernia

### INTRODUCTION

Congenital diaphragmatic hernia (CDH) characterized by protruding abdominal organs into the thoracic cavity through the posterolateral diaphragmatic defect and has high mortality.<sup>1</sup> The incidence of CDH is 1:2000 to 1:4000 live births and left CDH are more common (85%) than right-side hernias (12%).<sup>1</sup> Although CDH are diagnosed prenatally or in the immediate postnatal period, diagnosis can be late, and could be detected during routine examinations or examination because of respiratory or gastrointestinal problems.<sup>1</sup> Bochdalek hernia (BH) is commonest type of CDH usually seen on left side (80-90%), caused by the failure of the posterolateral diaphragmatic foramina to fuse properly. It results in

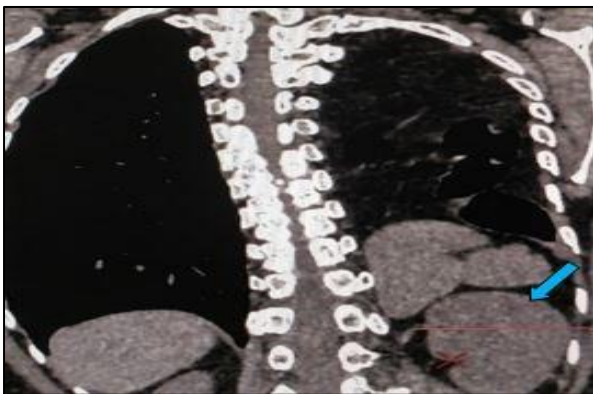
herniation of abdominal contents into the thoracic cavity. This occurs mainly during the ninth or tenth week of fetal life.<sup>2</sup> Larger defects in BH are associated with pulmonary hypoplasia on the affected side. Asymptomatic BH in adults is extremely rare and could be misdiagnosed. BH should be in mind in case of patient presenting with intestinal and pulmonary symptoms. Hereby reporting a rare presentation of BH which was asymptomatic for years and presented in late adulthood.

### CASE REPORT

A 48 years old female presented with complaints of dry cough and left sided chest pain for 1 week. The chest pain increases on coughing and deep inspiration. No history of

breathlessness or fever. No history of abdomen pain, vomiting or regurgitation. There was no significant history of trauma to chest or abdomen. Gradually patient started developing sensation of fullness of chest. Patient had no significant past or family history and no known comorbidities. On examination, patient's general condition was fair, and vitals were stable. On auscultation of chest, air entry was decreased, and diminished breath sounds on the left side chest with abnormal gurgling sounds heard in addition. Abdomen was soft with bowel sounds heard, on examination.

All blood investigations were within normal limits. Chest x-ray showed elevated left diaphragm with air fluid level in left hemi thorax- likely intra thoracic gas bubble. CT chest was done which revealed diaphragmatic hernia- a defect of 7.6×4.85 cm in posterior aspect of left diaphragm causing herniation of splenic flexure, transverse colon, descending colon, mesocolon, omentum, spleen and superior pole of left kidney as content. No evidence of bowel wall thickening or fluid and atelectasis of Left Lung lower lobe (figure 1). Ultrasonography of abdomen was normal.



**Figure 1: Normal level of left dome of diaphragm (blue arrow).**



**Figure 2: Spleen (black arrow).**

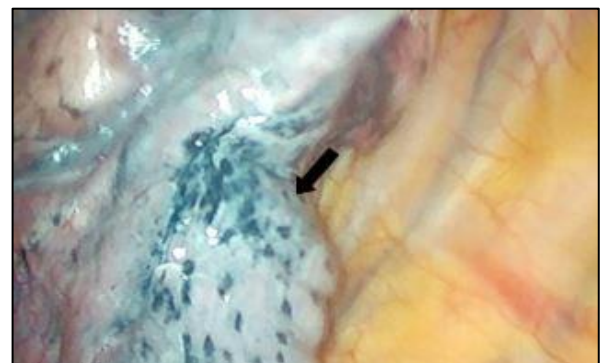
### **Treatment**

Patient was taken up for elective laparoscopic repair under endotracheal general anesthesia, after pre-operative work

up. Four ports were inserted in the upper abdomen and the liver was retracted. A defect of size 6×10 cm noted in left dome of diaphragm. The contents of transverse and descending colon with mesocolon, omentum, splenic flexure, spleen and upper pole of left kidney, were noted along with atelectasis of left lung lower lobe. (Figure 2, 3 and 4)



**Figure 3: Transverse colon (black arrow).**



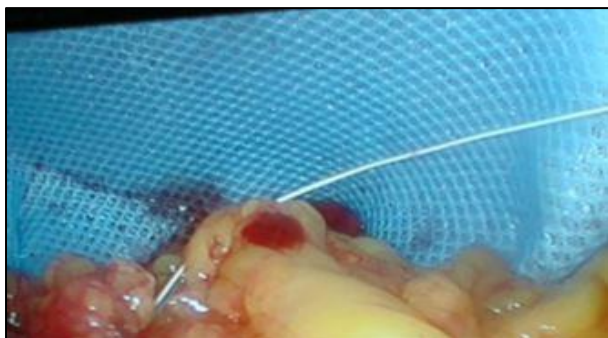
**Figure 4: Left lung lower lobe atelectasis (black arrow).**



**Figure 5: Suturing of the defect.**

The contents were reduced back into the abdominal cavity. Atelectasis started relieving and expansion of left lung noted once positive pressure ventilation was initiated. Following the reduction of content, the defect was sutured using vicryl material. Medial part of upper lip of the defect approximated with lower lip and lateral part of upper lip of the defect approximated with intercostal muscle (figure 5).

Composite mesh was placed over the sutured defect and was secured with tackers (figure 6). Hemostasis achieved. Patient tolerated the procedure well.



**Figure 6: Composite mesh placement.**

### Results and follow up

Post-operatively patient recovered well. Patient was symptom-free during post-operative period. Post-operative x-ray showed expanding left lung.

Follow up of patient was done after 2 weeks and 1-month post-surgery during which patient was asymptomatic. Chest x-ray during follow up showed fully expanded lungs.

### DISCUSSION

CDH are of 4 major types: postero-lateral hernia of Bochdalek, anterior parasternal hernia occurring through the right sternocostal triangle (Morgagni hernia) or the left sternocostal triangle (Larry hernia), peritoneal-pericardial hernia, and herniation through central tendon with rest of the diaphragmatic musculature being normal.<sup>3</sup>

BH is the most common type of congenital diaphragmatic hernia. It develops due to the failure of closure of the posterolateral aspect of pleuroperitoneal canal, which takes place between 8 and 10 weeks of gestation. As the left canal closes later than the right, it occurs on the left side in 85% of cases.<sup>4</sup> Left sided contents include spleen, stomach, small intestine and colon and right sided includes liver and intestine. Colon is the most common intra-abdominal organs migrating through the diaphragmatic defect and may cause large bowel obstruction.<sup>5</sup> Majority of CDH patients present at new born, late presentation may be due to delayed rupture of peritoneal sac containing the viscera, or plugging of hernia defect by solid organ due to raised abdominal pressure in severe strain, obesity, pregnancy and during labour.<sup>6</sup>

A left side BH may be associated with lung hypoplasia, extra-lobar sequestration, malrotation of midgut, and cardiac defects and on the right side; it is often associated with hypoplasia of the right lobe of liver.<sup>7</sup> Symptomatic BH in adults are relatively rare, but the incidence of asymptomatic BH found on autopsies in adult has been

estimated to be in between 0.014-0.05%, while reaching 6% in early CT findings.<sup>8-10</sup> When these hernias present with symptoms, they usually involve the gastrointestinal or pulmonary system. Symptomatic severe BH in adults however, manifest as gastrointestinal symptoms related to obstruction of the herniated organ.<sup>11</sup>

A study conducted by Brown et al demonstrated that only 14% of these patients were symptomatic at presentation.<sup>12</sup> These symptoms included pain/pressure in the chest or abdomen (69%), obstruction (39%), pulmonary symptoms (37%), strangulation (28%), dysphagia (3%), bleeding (4%), Gastroesophageal reflux disease (GERD) (4%) and other 9%. Gastric volvulus and obstruction and strangulation of the small or large gut are potential complications. In addition, gastric reflux and pancreatitis have been noted. A significant number of these patients with BH are misdiagnosed due to a combination of the rarity of this condition in adults and the varied clinical presentation.

The incidence of misdiagnosis has been reported to be 38%.<sup>13</sup> The misdiagnosis includes hydropneumothorax, hemothorax, empyema, pleural effusion, and pneumonia. The consequence of misdiagnosis is a delay in appropriate management, leading to a potential risk of strangulation; some of these unfortunate patients, in whom an intercostal tube is inadvertently placed, could have serious consequences.

In view of the risk of misdiagnosis, some have suggested to look for additional clues in patients who present with respiratory symptoms and are suspected to have BH.<sup>14</sup>

These included: abdominal or thoracic symptoms aggravated in the supine position; postprandial respiratory symptoms; gurgling sounds in the chest with bowel sounds heard on auscultation; radiographic abnormalities while supine; and abdominal symptoms aggravated by physical effort.

In the diagnosis of BH, direct chest and abdominal radiography, barium meal series, ultrasound, CT of chest and abdomen, magnetic resonance imaging (MRI) is available. Multi-slice computed tomography of the sagittal and coronal images of diaphragmatic hernia was most commonly used. Contrast-enhanced CT is the most accurate imaging modality for its detection because it provides detailed information regarding the diaphragmatic defect and herniated viscera.<sup>15,16</sup>

The management of BH includes reduction of hernial contents to the peritoneal cavity and repair of the diaphragmatic defect. Regardless of the type of surgical procedure, repairing the defect is likely important for the restoration of the anatomy between the thoracic and abdominal cavities. In addition, prosthetic mesh placement is preferred due to continuing stress on the diaphragm that results from respiratory movements and cardiac motions. Laparoscopic repair can be performed with a low



complication rate (7%) and short hospital stay (4 days). In the laparoscopic repair of BH visualization and working space is excellent.<sup>17</sup> One difficulty faced is that the contents tend to go back in the thorax because of the positive intra-abdominal pressure due to pneumoperitoneum and it is overcome by holding it back in the abdomen with a grasper. The closure of the defect can be done by different methods. When the defect is small it can be simply sutured closed, but when it is large (>10 cm square) it will need a prosthetic reinforcement.<sup>18,19</sup> Although polypropylene mesh has the benefit of support and excellent tissue growth.<sup>20</sup> The decreased tendency for adhesion formation of polytetrafluoroethylene (PTFE) and other dual prostheses makes them more desirable. However, in our case, we used composite mesh comprising of polypropylene and polyester (non-absorbable) with anti-adhesive properties (absorbable), which gave good result.

## CONCLUSION

BH in adults is uncommon. Laparoscopic repair helps in delineating clear anatomy, provides adequate working space, aids in early recovery and shortens the hospital stay. Hence laparoscopic repair of congenital diaphragmatic hernia in adults is a safe and effective modality in hands of experienced surgeons.

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