Bochdalek's Hernia in Adults – a Report of 4 Cases

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Citation

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Abstract

Bochdalek's hernia, a congenital posterolateral hernia of the diaphragm, usually manifests in the neonatal period and occasionally in childhood. Symptomatic Bochdalek's hernias are uncommon in adults.Patients are initially investigated and treated for other diseases, therefore diagnosis is purely incidental. We present 4 cases of Bochdalek's hernias that presented in our hospital in between 2001 and 2006 .All patients were initially managed for other conditions and discovery of the hernias was incidental. In this article we aim to highlight the diagnosis and successful management of these 4 cases.

INTRODUCTION

Bochdalek's hernia or congenital posterolateral hernia of the diaphragm is a neonatal emergency seen in 1 in 2200 births. Its presentation is very rare in adults. The incidence of asymptomatic Bochdalek's hernia in adults is reported to be 0.17% to 6%. We would like to present 4 symptomatic cases treated in our hospital from 2001 to 2006.

CASE REPORT

CASE REPORT 1

A 45-year-old female with no previous history of trauma presented with complaints of postprandial epigastric pain and dyspnea with left-sided chest pain of one-month duration. On examination, there were findings suggestive of left lower zone consolidation Chest x-ray revealed homogeneous left lower zone opacity with effusion and few air pockets with air-fluid levels suggestive of pneumonia.

Her blood counts, haemogram and biochemical investigations were normal. A flexible Oesophago-Gastro-Duodenoscopy (OGD-scopy) was performed. The stomach was seen deviating to the left with segmental narrowing; the pylorus could be seen but could not be negotiated, suggestive of a volvulus. Barium meal follow-through demonstrated a large part of the stomach, small bowel, transverse colon and splenic flexure in the left hemithorax.

The patient was taken up for exploratory laparotomy via a left subcostal incision. The stomach with the distal 2/3 of the transverse colon and the splenic flexure were seen in the left hemithorax. A 5x6cm defect was seen in the posterio-lateral diaphragm; there was no hernia sac.

The defect was closed primarily with No. 1 Nylon and reinforced with a Prolene mesh. The patient has been followed up and is doing well with no symptoms.

CASE REPORT 2

A 32-year-old male presented with abdominal pain and breathing difficulty following a large meal also associated with vomiting. He had a history of a similar episode 6 months back, which was relieved with medication. On examination, he was tachypnoeic with tachycardia. There was a tracheal and mediastinal shift to the right side with decreased air entry in the left lower zones with normal breath sounds.

Chest x-ray showed a herniated large-bowel loop in the left hemithorax with an air-fluid level. CT of the thorax demonstrated a completely compressed left lung with mediastinal shift to the right. The stomach and colon were seen in the left hemithorax.

He underwent an upper midline laparotomy and the caecum, ascending colon and parts of jejunum and ileum were seen herniating into the left hemithorax. There was an 8x6cm oval-shaped defect in the left hemidiaphragm, with deficient left crus. The defect was seen extending on to the central tendon. There were dense adhesions between hernial contents and surrounding structures, therefore necessitating a left antero-lateral thoracotomy in the 7th intercostal space. The left lung was seen fully collapsed. The hernial contents could be released and reduced back into the abdomen. The defect was closed with a Teflon patch.

Primary abdominal closure was not possible; therefore, the

bowel loops were covered with omentum and peritoneum. A Marlex mesh was placed pre-peritoneally on the posterior rectus sheath and anchored to the anterior rectus sheath. As skin closure was not possible, an opened urosac was sutured to the skin edges with a suction drain in situ.

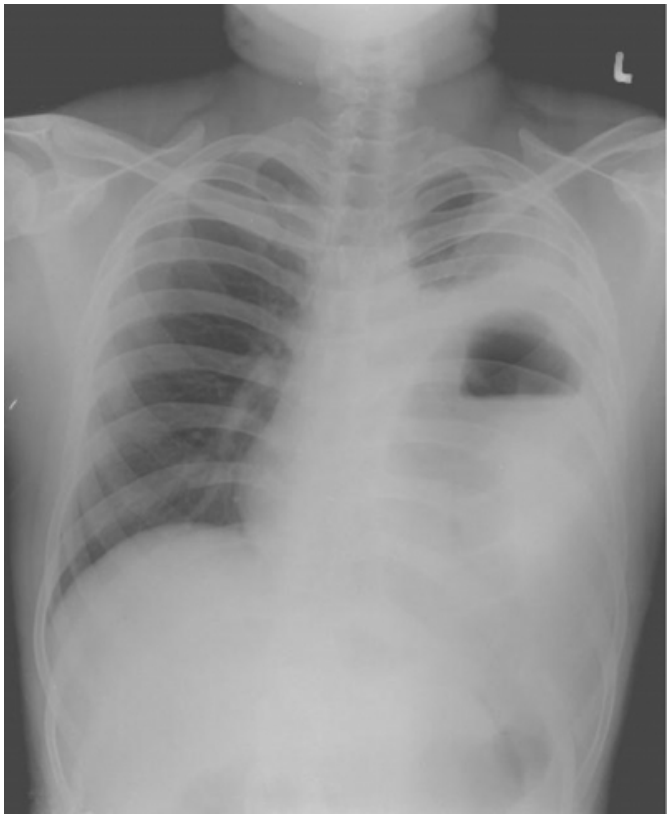
The patient was kept in ICU on ventilatory support. There was no evidence of abdominal compartment syndrome. The abdominal wound was covered with a sterile plastic sheath with a vacuum drain (Vacuum assisted closure) by the plastic surgeons. It was possible to remove the mesh 45 days later and close the rectus sheath and the skin primarily. At present, the patient is doing well with no complaints. There is a midline scar present with some weakness but there is no incisional hernia.

CASE REPORT 3

A 20-year-old male with no history of trauma presented to the emergency department with history of generalized abdominal pain, colicky in nature, along with absolute constipation for 48 hours. There was a history of occasional postprandial epigastric pain and breathlessness and of on-and-off left hypochondrial pain with radiation to the left shoulder.

There was no other significant history. On physical examination, the patient had normal vital signs but was mildly dehydrated. There was left hypochondrial tenderness with decreased air entry in the lower left chest but normal breath sounds. A clinical diagnosis of intestinal obstruction was made. The haemogram, serum electrolytes and renal functions were within normal limits. Abdominal x-ray revealed multiple air-fluid levels confirming intestinal obstruction. Chest x-ray showed presence of dilated bowel loops in the left hemithorax with air-fluid levels.(Figure 1)

Figure 1



An emergency laparotomy was done, via upper midline incision. The large bowel was dilated from caecum to the splenic flexure. The stomach was distended. There was herniation of the splenic flexure, the distal 1/3 of the transverse colon and the greater omentum into the left hemithorax. A defect of 4x3.5cm was present in the left postero-lateral diaphragm. There was a left pleural effusion.

Contents could be easily reduced transabdominally. The defect was closed primarily with 2.0 Prolene. The postoperative period was uneventful. On follow-up, complete re-expansion of the left lung was seen and at present the patient is totally asymptomatic.

CASE REPORT 4

A 65-year-old diabetic female with no history of trauma presented to the emergency department with severe dyspnea following a meal. There was no other significant history. On physical examination, the patient's pulse and blood pressure were not recordable, she was acutely dyspnoeic, but conscious. On auscultation, there were no breath sounds on the left side of the chest and there was gross tracheal shift to the right side with a hyper-resonant note on percussion.

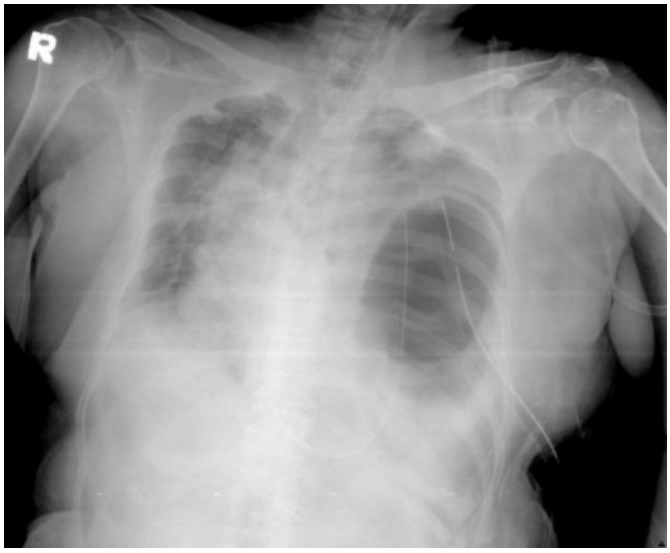
An urgent chest x-ray was taken and showed an air-filled cavity in the left hemithorax causing a mediastinal shift to

the right. A diagnosis of tension pneumothrax was made. An intercostal drainage tube was immediately placed into the left pleural cavity. No air was drained. However, pulse and blood pressure was now recordable. The chest x-ray was repeated to confirm the position of the chest tube. The air-filled cavity was seen to persist in the left hemithorax. A nasogastric tube was placed and drained bile-stained fluid. A repeat chest x-ray showed the nasogastric tube coiled up in the left side of the chest (Figure 2); therefore, a diagnosis of a diaphragmatic hernia was made. The haemogram, serum electrolytes and renal functions were within normal limits. The patient had mild acidosis. CT of the thorax was done and confirmed a posterolateral diaphragmatic hernia on the left side of the chest. The contents were the stomach, which had undergone volvulus, the transverse colon and the spleen. The lung was compressed on the left side.

The patient was posted for emergency laparotomy. The stomach had organo-axial volvulus. The entire stomach, greater omentum, the entire transverse colon, the splenic flexure and the spleen had all herniated into the left thoracic cavity. The color of the stomach was slightly dusky. All the contents could be reduced easily into the abdominal cavity. After reduction, an oval defect measuring 7x8cm was seen on the posterolateral aspect of the left hemidiaphragm. There was no peritoneal sac. The left lung appeared hypoplastic. The stomach color returned to normal. The defect was closed in a single layer with 1.0 Prolene. A synthetic mesh was used to reinforce the repair. The chest tube placed earlier was repositioned and abdominal closure was attempted. However, during the closure the patient had severe hypotension; therefore, a total omentectomy was done to prevent abdominal compartment syndrome. The abdomen was then closed. There was no hypotension in the postoperative period.

However, the patient was not maintaining adequate saturation and therefore was electively ventilated for a period of 15 days. She was gradually weaned of the ventilator. The chest tube was removed on the 20th postoperative day. She was discharged on the 30th postoperative day without any symptoms. She is on regular follow-up.

Figure 2



DISCUSSION

Bochdalek's hernia – a congenital posterolateral hernia of the diaphragm – affects about 1 in 2200 to 12500 births and usually presents as a neonatal emergency[1]. Beyond the neonatal period, this condition is extremely rare, more so in the adult. The incidence of Bochdalek's hernia in routine CT scans has been reported to vary from as low as 0.17% to as high as 6%[23]. Thus, they are more common than assumed but the majority stay asymptomatic and only very few present with complications.

Thus, only about 105[4] cases have ever been reported in the literature. Asymptomatic hernias may be missed and it is only those hernias, which become complicated or symptomatic that present themselves to the clinician.

First reported by Vincent Alexander Bochdalek in 1848, the congenital posterolateral hernia of the diaphragm occurs due to persistence of the pleuroperitoneal canal owing to non-fusion of the pleuroperitoneal folds. If the fusion fails early in the gestational period, the peritoneal sac may be absent. This happens in more than 85% of cases[5]. The hernia tends to occur more often on the left side because the right pleuroperitoneal fold fuses earlier than the left and the liver is supposed to act as a barrier. All 4 cases reported by us were located on the left side and showed no evidence of a peritoneal sac.

Diagnosing this condition in the adult is rather difficult, and on most occasions purely incidental. All 4 of our cases were initially diagnosed and treated for other conditions. Patient's complaints are usually vague ranging from gastrointestinal symptoms to acute dyspnea. Adult patients usually present

with vomiting, abdominal pain and distension. Patients may also complain of exertional dyspnea and chest pain. Acute dyspnea is seldom seen[67]. In our series, the commonest symptom was postprandial dyspnea and postprandial epigastric pain, seen in 3 of our 4 patients. Even in the single patient who presented with acute dyspnea the triggering factor was a meal.

Radiological investigations play a significant role in the diagnosis of this condition. Chest x-rays may constantly show an air-fluid level indicating the stomach as content within the thoracic cavity. Rarely, bowel loops may be seen. Three of our four cases showed the presence of dilated bowel loops in the thorax with air-fluid levels. Placement of a NG tube and subsequent chest x-ray may serve a dual purpose: firstly, aiding to decompress the stomach and secondly, confirming the presence of the stomach in the chest. CT scan usually confirms the diagnosis so that further management can be planned accordingly[1].

Treatment is essentially surgical. Surgery includes exploratory laparotomy, reducing the contents and examining the contents for any injury, perforation and viability. The contents are usually reducible via the abdomen but a thoracotomy may be sometimes required. The defect can be identified and a primary closure can be done using non-absorbable suture material. A synthetic mesh or Teflon patch may be used to reinforce the repair. This was done in 3 of our cases. Laparoscopic repair has also been described in the literature[8].

A significant problem one may encounter is difficult abdominal closure. An omentectomy may be useful to avert abdominal compartment syndrome, but there is no literature to support this. If abdominal compartment syndrome is suspected or has to be averted, one may use a synthetic mesh to close the abdominal defect as was done successfully in one of our cases.

Despite the congenital nature of the problem, the outcome is excellent and most patients do show a complete re-expansion of the involved lung as seen in all 4 of our cases.

CONCLUSIONS

- Bochdalek's hernia in an adult remains a rare clinical entity.
- Postprandial dyspnea and epigastric pain are two of the common symptoms.
- Chest x-ray after nasogastric tube placement may help in diagnosis when stomach is the content – CT scan confirms the diagnosis.
- A mesh may be used to strengthen the primary repair.
- Abdominal compartment syndrome is a rare postoperative complication and, when suspected, a mesh may be used to help in abdominal closure.

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References

1. Shin MS, Mulligan SA, Baxley WA, Ho KJ. Bochdalek hernia of diaphragm in the adult. Diagnosis by computed tomography. Chest 1987; 92:1098-1101.
2. Mullins ME, Stein J, Saini SS, et al: Prevalence of incidental Bochdalek's hernia in a large adult population: AJR Am J Roentgenol 2001; 177: 363-6.
3. Gale ME. Bochdalek hernia: prevalence and CT characteristics. Radiology 1985; 156: 449-452.
4. Cosenza UM et al. The Bochdalek hernia in the adult: case report and review of the literature. G Chir 2004; 175: 9.
5. Nyhus L, Condon R. Hernia. 4th ed. Philadelphia, PA; J.B.Lippincott Co.; 1995: 555-66.
6. Fine R, Borrero E, Stone A. Bochdalek hernia in adulthood. N Y State J Med 1987; 87: 516-518.
7. .Hines GL, Romero C. Congenital diaphragmatic hernia in the adult. Int Surg 1983; 68: 349-351.
8. Thoman DS et al. Laparoscopic diaphragmatic hernia repair. Surg Endosc 2002; 16: 1345-9. Epub 2002 May 3

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