UNUSUAL PRESENTATION OF RIGHT SIDED BOCHDALEK HERNIA IN AN ADULT
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ABSTRACT: Herniation of abdominal content through a persistent embryonic pleuroperitoneal hiatus is most common form of congenital diaphragmatic hernia. Bochdalek hernia is a congenital anomaly in neonatal and postnatal patients and occur in about one in 2,200 to 12,500 live births, but it is rare in adults.1 75% to 90% occur on left side2,3,4 Here we present a rare case of 24 years old male patient with Bochdalek hernia on right side.

KEYWORDS: Diaphragmatic hernia, Congenital, Bochdalek hernia, Right sided.

INTRODUCTION: Bochdalek hernia is a type of congenital diaphragmatic hernia that primarily manifests in neonates and children. It is rare in adults and accounts for about 0.17% to 6% of all diaphragmatic hernias.2,3 Bochdalek hernia affects approximately 1 in 2,200 to 12,500 live births and was first described by Vincent Alexander Bochdalek in 1848.4

Presentation of a Bochdalek hernia in an adult is exceptionally rare. Kirkland in 1959 published first review of 34 cases of adult Bochdalek hernia.5 Quite often an adult Bochdalek hernia is detected as an incidental finding on CT scan of the abdomen in asymptomatic adults; alternatively it may be diagnosed only after complications occur. Most of the hernias (80% to 90%) are found on the left side. Right sided hernias are rarer because the right pleuroperitoneal canal closes earlier and the liver buttresses the right diaphragm.6 There are fewer than 100 cases of Bochdalek hernia reported in adults in the literature and fewer than 20 of those cases involve right sided hernias.7

CASE REPORT: A 24 years old male presented to our OPD with breathlessness on exertion for three months and pain over epigastrium for 1 day. Breathlessness was gradual in onset and was present only on moderate activities. There was no diurnal or postural variation present and also there was no association with dust or fumes. Patient had pain over epigastrium for one day. He had similar episode of pain 2 months back. Pain was dull aching type, severe in grade with no radiation.

Patient was driver by profession. He was non-smoker and had no addiction of any type.

On general examination, there was no pallor, icterus, cyanosis, clubbing, lymphadenopathy or oedema. His pulse rate was 78/min, respiratory rate 16/min, BP 110/86mm Hg and patient was afebrile. On systemic examination, the abdomen was soft, non-tender with no obvious organomegaly. Chest was symmetrical in shape. Movement and expansion were bilateral symmetrical. On auscultation, there was decreased air entry on right side of chest and vocal fremitus and vocal resonance were also reduced on the same side.
On this suspicion, Chest radiography was performed which revealed the right hemidiaphragm was exceptionally high. Spirometry showed moderate restriction. USG thorax and abdomen were performed which showed epigastic location of right kidney with eventration of right hemidiaphragm. A provisional diagnosis of right sided diaphragmatic hernia was made and barium meal follow-through was advised which showed that hepatic flexure of large bowel loops and ileal loops are higher up in position under the right dome of diaphragm. A contrast enhanced CT scan of the thorax and abdomen was performed which confirmed the presence of small bowel, right colon, right kidney and right lobe of liver in thoracic cavity causing mass effect on right lung confirming the diagnosis of right sided Bochdalek hernia.

Patient underwent Short lateral thoracotomy in the department of cardiothoracic surgery and the herniated organs were moved back to the abdominal cavity and defect was closed.

The post-operative course was uneventful and the patient was discharged 7 days after the operation. At follow up, he had no symptoms and his chest X-ray was normal.

DISCUSSION: The foramen of Bochdalek is a 2cm x 3cm opening in the posterior aspect of the diaphragm in the foetus, through which the pleuropertinial 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. Since the left canal closes later than the right, this type of hernia is found on the left side in 85%-90% of cases. The organs that most commonly herniate into the thorax through this defect are stomach, ileum, colon and spleen. The liver and the right kidney may herniate along with the bowel loops if the defect is on the right side as in our patient. The clinical presentation in adult and paediatric age group is different. In neonates and infants, it may present with respiratory distress and cyanosis. Presentation of Bochdalek hernia in adults is varied and patients may be asymptomatic or may present with chest pain, difficulty in breathing, abdominal pain and even with features of intestinal obstruction. It is believed that the delay or absence of symptoms may be due to occlusion of the diaphragmatic defect by the abdominal viscus. Our patient presented with features of epigastric pain and breathlessness on routine exertion. The late presentation of this abnormality possesses a great difficulty in diagnosis and hence a careful examination, strong index of suspicion and imaging studies like Computed Tomography are needed to reach a correct diagnosis. Some patients have no symptoms and the disorder is unexpectedly detected on chest X-ray. The clinical presentation of a right sided Bochdalek hernia can also manifest as strangulation of the contents of hernia, colon necrosis, hemothorax, septic ureteric obstruction which can be life threatening and need urgent surgical intervention.

The suspicion of presence of Bochdalek hernia can be made by conventional radiological methods like plain radiographs and barium studies. Diagnosing this condition in an adult is rather difficult, and on most occasions, purely incidental.

Computed tomography is believed to be the most accurate method of diagnosing and evaluating the contents of these hernias, especially the smaller ones. Without the use of CT, nearly 38% of adults are misdiagnosed as pleural effusion, empyema, lung cyst and pneumothorax. Left sided Bochdalek hernias have reportedly been associated with lung
hypoplasia, extralobar sequestration, malrotation of the midgut and cardiac defects, whereas, right sided hernias are generally associated with hypoplasia of the right lobe of liver and diaphragm.\textsuperscript{15}

The treatment of Bochdalek hernia is operative and patients generally do not have any recurrence and remain asymptomatic.

**CONCLUSION:** We, hereby, report a rare case of a right sided Bochdalek hernia which was asymptomatic and remained undetected till adult life. Even though rare, this disorder should be recognised, examined and treated to avoid subsequent life threatening complications.

**Images Related to the Case:**

- **Fig. 1:** Chest X-ray (PA) Showing elevated Rt hemidiaphragm
- **Fig. 2:** Barium meal showing position of hepatic flexure and ileal loops
- **Fig. 3:** Thorax abdomen (coronal section) showing small bowel right colon right kidney and right lobe of liver in thoracic cavity
- **Fig. 4:** CT-thorax showing Rt kidney and bowel loops in thorax
Bochdalek Hernia | Morgagni Hernia | Hiatal Hernia
--- | --- | ---
Mostly asymptomatic in adults | Generally asymptomatic | Mostly asymptomatic, may cause gastric discomfort, heart palpitations
Mainly on left side, may present as elevation of dome of diaphragm on Chest X-ray | Mainly on right side, rarer, 2% of all diaphragmatic hernias. Similar findings on Chest X-ray as in Bochdalek Hernia | Presents as mediastinal widening on Chest X-ray
Present posteriorly, large | Present anteriorly, small | Herniation of upper part of stomach into thorax due to weakness or tear in diaphragm
CT thorax shows liver, kidney, bowel loops, spleen, and colon | CT thorax shows herniation of bowel loops, omentum | CT Thorax shows herniation of stomach in the thoracic cavity

DIFFERENTIAL DIAGNOSIS OF CONGENITAL DIAPHRAGMATIC HERNIAS

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