CONGENITAL DIAPHRAGMATIC HERNIA IN THE ADULT

Pages with reference to book, From 16 To 20

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Abstract

Diaphragmatic hernia through pleuroperitoneal canal of Bochdalek in the adult is a rare surgical occurrance. Two adult males 26 and 43 years of age with left sided hernia of the foramen of Bochdalek with abdominal viscera in the thoracic cavity were treated in North Surgical Unit. The major part of the contents in both cases consisted, of greater omentum and transverse colon whereas in one patient the thoracic cavity also contained portions of stomach and jejunum. These patients were admitted as emergency with acute upper abdominal symptoms and respiratory embarrassment which was more marked in one patient who had been misdiagnosed as a case of tension pneumothorax and treated by an intercostal drainage tube at a peripheral hospital before he was referred to us. This patient in fact was later found to have a perforation in the transverse colon which was lying in the chest cavity.
In the adults these invariably present us emergency due to strangulations of the herniated contents. The diagnosis is often missed because of the rarity of the condition, although the need for an urgent and accurate diagnosis is imperative for correct management. The chest X-Rays in these patients tell the whole story provided they are looked at carefully (JPMA 36: 16, 1986).

CASE I

A 43 years old male was admitted in emergency ward on 13th September 1980 at 7 p.m. with sudden severe abdominal pain for the last two days. It started in the region of umbilicus and radiated across the left side of abdomen to the back. Patient had vomited four times before reaching the Hospital. He also complained of absolute constipation for 24 hours and abdominal distension for the same duration. There was no history of trauma or any other operative procedure oft the chest, which could explain his dyspnoea.
On examination, he was dehydrated, had a pulse of 116/mm, BP 120/65 mm of Hg and normal temperature. Chest examination revealed diminished air entry on left side. Abdomen was distended and tense, and tender in left hypochondrium. Bowel sounds could be heard on auscultation. Plain X-Ray abdomen showed multiple fluid levels. X-Ray chest revealed a hazy left costophrenic and a radiolucent shadow in the lower zone of the lung fields.
Investigations revealed TLC 8,000/cmm
Blood urea 42 mg%
Serum sodium 136 mEq/L
Serum Potassium 3.8 mEq/L
Nasogastric suction and I/V fluid therapy was started but the condition did not improve the possibility of a diaphragmatic hernia was not considered preoperatively. An emergency laparotomy was performed with a diagnosis of acute intestinal obstruction. On opening the abdomen a portion of greater curvature of stomach, a small part of jejunum, left part of transverse colon and greater omentum had herniated into the left thoracic cavity through a 5 cm x 4 cm defect in the posterolateral part of the diaphragm. The herniated viscera were viable. Abdominal contents were reposed. Defect in the diaphragm was closed with Nylon sutures. The thoracic cavity was drained by two chest tubes, one in the 2nd and the other in 7th intercostal space. Postoperative recovery was uneventful. Chest tubes were taken out one

after the other on 3rd and 4th postoperative days. The patient was discharged on 10th day on one year follow up he was symptom free.

CASE 2

A twenty six year old school teacher reported to the emergency ward of Mayo Hospital on 27th March, 1984 at 6.15 p.m. with six days history of upper abdominal pain which was sudden in onset and became continuous. He also complained of absolute constipation for the last three days. On the 4th day he developed dyspnoea, which was rapidly progressive and was present even when sitting in the bed. There was no history of chest pain, previous trauma to the chest, or any operative procedure in the past. This patient visited a peripheral hospital, where his plain X-Rays of abdomen and chest were taken. A tube was put in his left chest to relieve the dyspnoea but without effect, he was ultimately referred to Mayo Hospital.

At the time of admission his pulse was 140/mm, B.P. 110/60 mm Hg and respiratory rate 40/mm. Chest expansion was decreased on the left side with diminished air entry on auscultation. Abdomen was tense, but not tender and bowel sounds were present. X-Ray chest showed radiolucent shadow on the left side with collapse of left lung near the hilum. A few fluid levels could be marked in the left chest. Plain X-Ray abdomen in erect posture showed broad radiolucent shadow transversely across the upper abdomen simulating distended transverse colon.

Laboratory data were as follows:

T.L.C. 16,000/cmm

Blood urea 42 mg%

Blood Sugar (Random)! 10 mg%

Serum sodium 130 mEq/L

Serum Potassium 4.0 mEq/L

A provisional diagnosis of left sided diaphragmatic hernia was made and an emergency laparotomy was performed after due resuscitative measures. The abdomen was opened through a left paramedian incision. On exploration it was found that the transverse colon and splenic flexure had herniated into thoracic cavity a defect 4 cm x 3 cm in the posterolateral part of diaphragm just above the spleen. As it was not possible to mobilize the herniated large gut through abdominal approach the incision was converted into thoraco abdomenal through 7th space. A large loop of colon with greater omentum was seen reaching upto the apex of left thoracic cavity. The colon had become gangrenous with foul smelling fluid around it in the chest. The left lung was seen collapsed near the hilum.

The gangrenous transverse colon was excised and a “Divine” abdominal colostomy was performed. Defect in the diaphragm closed with interrupted nonabsorbable zero prolene sutures. Left thoracic cavity was drained by two chest tubes, one in the 2nd and other in the 7th intercostal space. Patient had a stormy postoperative course but eventually made a slow recovery with expansion of left lung and was discharged on 25th day with colostomy. This was 6 months after the original procedure. To date this patient is symptom free.

DISCUSSION

Hernia through the pleuroperitoneal canal is the most common congenital diaphragmatic hernia.[1] It is a relatively frequent condition in the infants and children, but is quite rare in the adults. The defect is usually found on the left side and in most instances there is no peritoneal sac.[2]This hernia often presents as an acute respiratory distress at or shortly after birth, depending upon the size and quantity of herniated abdominalviscera present in the thorax. Rarely such a defect remains undetected until late childhood and in exceptional circumstances it may present in adults as a surgical curiosity when the symptomatology would be related to gastrointestinal tract.[3]

The central portion of the diaphragm develops from the septum transversum which grows caudal to the

heart at about the 8th week of foetal life in a back-ward direction to meet the dorsal mesentry of fore gut known as meso-oesophagus.[4] Pleuro-peritoneal folds develop on each side and progress postero-laterally dividing the thoracic from abdominal cavity. Arrest of process at this stage results in the persisting pleuroperitoneal canal which was described by Victor Alexander Bochdalek, Professor of Anatomy, Prague, Czechoslovakia in 1876. Giovanni Battista Morgagni, Professor of Anatomy, Padua, Italy in 1761 described/n other communication between pleural and peritoneal cavities immediately dorsal to the growing sternum known as foramen of Morgagni[5]. Late fusion of the components of diaphragm on the left side partially explains the 9O% defect on this side.[6] Whether these hernias occur in the infants or adults they usually have no sac because of free communication of pleural and peritoneal cavities.[7]

Herniation of abdominal contents into the thorax may occur through a congenital or acquired defect in the diaphragm. Congenital hernias occur at certain well recognized points like pleuroperitoneal canal of Bochdalek or pleuroperitoneal canal of Morgagni. [8] The acquired hernias are mainly through oesophageal hiatus. Other may be traumatic or post operative and may occur anywhere in the diaphragm[9].

In the infants hernia through the Bochdalek canal where it is relatively common, the onset is sudden and the signs are essentially cardio-pulmonary typically as the triad, dyspnoea, cyanosis and mediastinal shift.[10] Many investigators with wide paediatric surgical experience have commented that patients with hernias of the foramen of Bochdalek present clinically in two distinct groups. The first group consists of neonates who have marked respiratory distress in the first twenty-four to seventy-two hours of life. These infants have a high operative mortality primarily because of respiratory insufficiency. In almost all of these infants who die, the ipsilateral lung does not expand well at surgery, being hypoplastic. The second group consists of infants who after the first twenty-four to seventy-two hours of life often present gastrointestinal symptoms or a history of repeated respiratory infections.[11] Garvier et al. believe that these infants do not have herniation of the viscera at birth but that it occurs later and therefore the ipsilateral lung is well expanded. These infants generaliy do very well after surgery.[12]

Signs and symptoms in diaphragmatic hernias are as a consequence of complications in exactly the same fashion as in internal hernias else where. [13] If omentum becomes entrapped, it acts like a natural plug and patient is likely to be symptom free. If neck of the sac is wide and there is free movement of viscera between pleural and peritoneal cavity, symptoms will be intennittent. If the neck is narrow or the hemiated loops are excessive the intestine can become obstructed and undergo strangulation with serious consequences.[14]

The organs most commonly present in Bockdalek hernias are greater omentum, transverse colon, liver, small intestine and spleen. On rare occasions organs like pancreas, apppendix, ovary and Meckles diverticulum have been found as contents of the hernia.[15] It is usually the left part of transverse colon, splenic flexure, and the descending colon which herniate along with great omentum.[16] If the defect is large it may drag the greater curvature of stomach into the thoracic cavity. Herniation of greater curvature of stomach leads to organoaxial volvulus with the greater curvature rotating upper most and causing obstruction at cardia and pylorus.[17]This is precipitated by sudden distension of the stomach as after a heavy meal. Inability to pass the Ryle's tube beyond cardia should suggest the possibility of volvulus of stomach[18]

Presentation of a diaphragmatic hernia as acute Pancreatitis with associated Paralytic lleus has been recorded by Raymond et al. Tail of pancreas herniates alongwith other abdominal viscera which cause traction on the organ with resulting ischemia leading to acute pancreatitis[19]

Postero-anterior chest X-Ray is a quick, simple and effective investigation. It will allow in most

instances a diagnosis of diaphragmatic herniation to be made confidently. On rare occasions differentiation from an intrapleural or intrapulmonary lesion may be difficult. Blunting of the costophrenic angle with history of acute progressive intestinal obstruction should arouse suspicion of a diaphragmatic hernia.[20] The presence of an opaque nasogastric tube may be of value because it demonstrates the position of stomach and also decompresses the upper gastrointestinal tract[21].
Barium studies of the gastrointestinal tract may be used in the investigations of a chronic diaphragmatic hernia but they should be avoided in emergency cases, for which diluted contrast liquid like gastrograffin and X-Ray screening are preferable . Negative result may occur when the contrast medium fails to enter the herniated viscus or when a solid organ like spleen is involved.[22]
Thoracoscopy, laparo scopy, pneumoperitoneography, pleurography, hepatic and splenic scan and ultra-sonography are other tools available but these are time consuming and inaccurate procedures and are of questionable value in urgent cases.[21] 1 In our view the urgency of the surgical problem as well as the fact that these cases are often misdiagnosed and are rare are the reasons why these investigations are not carried out. One has to emphasise the importance of chest X-Ray and its careful reporting for the diagnosis of these cases. CT scanning is relatively quick and useful aid in the diagnosis of urgent cases.[23]
Once diagnosed immediate operation should be carried out to avoid the danger of strangulation.[24] Most authors believe that right sided defect should be repaired transthoracically, whereas those on the left side should be repaired transabdominally. If any difficulty is experienced in mobilizing the herniated abdominal viscera, the incision can be extended with advantage along the 8th, 7th and 6th rib to the 5th intercostal space as a thoracotomy.[25]
An analysis of both of, our patients shows that combination of, features of acute intestinal obstruction with sudden unexplained dyspnoea, tachypnoea and mediastinal shift should arouse the suspicion of internal diaphragmatic herniation. Good history, thorough clinical examination and plain radiography is all that is required to reach a diagnosis in these cases. Diminished respiratory excursion on the affected side and presence of bowel sounds in the chest remain the hall mark of a clinical diagnosis of diaphragmatic hernia. The presence of intestinal contents in the pleural cavity on plain X-Ray of abdomen and chest should clinch the diagnosis. A trans abdominal approach is preferable ‘in these cases and if the need is felt, it can easily be converted into thoracoabdominal procedure. In our experience the left dome of diaphragm can easily be repaired trans abdominally.

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