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A CASE OF DIAPHRAGMATIC HERNIA FOR TOTAL HIP REPLACEMENT SURGERY

Anesthesiology

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ABSTRACT

The major muscle for respiration is the diaphragm. A diaphragmatic hernia is described as presence of an orifice in the diaphragm which permits the passage of abdominal cavity contents into the thoracic cavity. There are two variants to diaphragmatic hernia, they being bochdalek hernia and morgagni hernia. Diaphragmatic Eventration and Central Tendon Defects are the other rare causes. My case is of a 65 year old male presenting with Diaphragmatic Eventration on the the right side. 90% of hernia cases present with left sided Bochdalek Hernia.

KEYWORDS

Diaphragmatic hernia, eventration, right sided diaphragmatic hernia

Introduction : Congenital diaphragmatic hernia present in the newborns, however, adult diaphragmatic hernia could either be congenital or acquired. Patients presenting with late diaphragmatic hernias have a variety of symptoms. They may also be asymptomatic. Hence, diagnosis may be difficult. (8)The most frequent symptoms are usually respiratory or gastrointestinal. The diagnosis of diaphragmatic hernia is based on clinical investigation and is confirmed by X ray and computed tomography. The first reported diaphragmatic hernia in an adult was in 1541 by Sennertus.[4]

Case History : A 65y old male presented to the emergency with history of fall in the bathroom without loss of consciousness. The patient reported with inability to move both the limbs and associated pain. The pain was continuous and of severe nature. He was not known to have any previous episodes of cerebrovascular accidents or hypertension. He was not a diabetic. He said his spine seemed to be normal without any pain. He was not on any medication. He reported of dyspnoea on exertion (NYHA grade II). He was not an asthmatic. He reported of never having had chest pain or palpitation. However, he gave history of occasional orthopnea. He mentioned that he has always felt heavy in the stomach and remained constipated. At times, he also found it difficult to void urine.

On examination, he was conscious, oriented, prostrated but able to sit up with support. His heart rate was 86 BPM, regular normal volume and character and a blood pressure of 128/75. He had moderate pallor, no icterus, clubbing or cyanosis. His Jugular Venous Pulsation was not raised and none of the lympnodes were enlarged. All peripheral pulses were palpable.

His mouth opening was adequate, mp grade II with normal neck extension. His thyromental distance was > 6cms. His teeth were intact with good oral hygiene. His spine was normal.

The respiratory rate was 13 BPM with regular breathing pattern. The antero posterior chest inflation was 3 cms on the right side and 4 cms on the left side. Thoracic cage appeared normal. On percussion the lungs were bilaterally resonant. On auscultation, normal vesicular breath sounds were heard in bilateral lung fields with absent breath sounds in the right lower lobe.

The precordium appeared normal. On auscultation S 1 and loud S 2 were heard in the mitral area without any added sounds or murmur.

The abdomen was distended with the umbilicus centrally placed. No venous prominences or scar marks were present. Liver and spleen were not palpable with no other organomegaly. There was no fluid thrill or shifting dullness and the abdomen was resonant in all quadrants. On auscultation, bowel sounds were heard normally.

An ECG and Echo study were done. There were t- wave inversions in leads 1 and avL in ECG which were of no significance. Echo revealed mild septal hypertrophy with normal valves and LVEF of 58%.

Routine investigations were done and it was found that the haemoglobin was 11 gm/dl,Platlete counts 1.5lakhs, total leukocyte count 4,500, DLC N77 L21 E1 B1, Absolute eosinophil count was 405 with random blood sugar of 90mg/dl, S.Urea 28.8, S.Creatinine 1.2, S.Na 132 and S. K 4.

X ray hip and spine revealed fracture neck of the right femur.

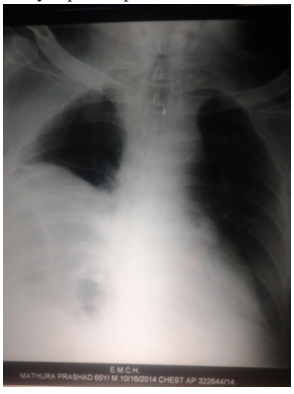


Figure 1 : Right diaphragm shifted above

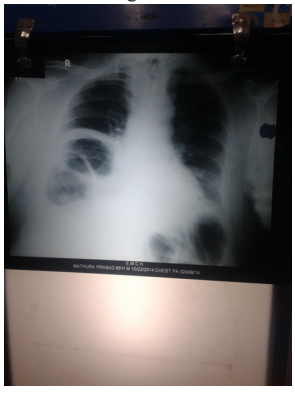


Figure 2 : gas shadows below the right diaphragm

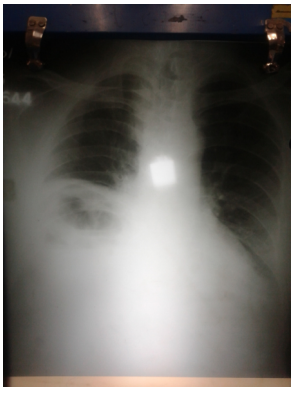


Figure 3 Right diaphragm shifted upto 4th costal cartilage



Figure 4 : Post operative x - ray

X ray chest revealed the following. The right side of the diaphragm was higher than the left going upto the fifth costal space. There were air fluid levels located below the right diapraghm with no hepatic shadow. The costo diaphragmatic angle and mediastinal angle were obliterated. The bronchovascular markings were prominent.

The above findings were suggestive of a diaphragmatic hernia of the right side.

Further evaluation was done by doing a CT scan of the thorax and abdomen. The CT revealed that the mediastinum window level showed

a small pleural fluid collection on the right side of the thorax. No focal or diffuse lung parenchyma pathological involvement was found. The esophagus was positioned on the right side of the descending aorta, besides the trachea. Gas-filled large bowel loops were evident, located over the right lower lung lobe. The hepatic flexure occupied the right inferior hemi-thorax, near the right heart atrium. the diaphragm was intact but shifted upwards. The other abdominal viscera, such as the spleen, stomach and the rest of the bowel loops, were situated in their correct anatomical positions. The patient did not receive surgical treatment because he was asymptomatic as he gave history of the same.



Figure 5 CT showing hepatic flexure of large intestine at the level of T 4 vertebra



Figure 6 The CT confirmed the diagnosis.

An ABG was done which revealed the following. Ph 7.45, pCO2 33, pO2 75 HCO3 22.9

A total hip replacement surgery was planned.

The patient was premedicated with ranitidine 150 mg and diazepam 5mg. On the morning of surgery, the patient after being shifted into the OT had, 2 wide bore 14 G canulas put and from which 1000 ml of crystalloid as Ringer lactate was given. Multi para monitors were attached where the heart rate, blood pressure, spo2, Etco2 and respiratory rate were monitored. The patient was positioned in the lateral position.

The back was scrubbed painted draped and via the loss of resistance technique a 16G tuohey needle was introduced into the L 1 L2 epidural space. After confirming by the hanging drop technique the space was threaded with an epidural catheter and fixed, with 8 mm remaining inside.

The L3 -4 spaces were felt and the 25 G quincke needle was introduced from which 3.5ml of Bupivacaine heavy was given intrathecally along with 25 micrograms of fentanyl.

After administration of the drug there was no loss of pain sensation of the lower limbs. It was decided to convert the anaesthesia technique from regional to general as the patient was in great distress due to the pain.

Inj. Fentanyl 2 microgms /kg, Inj Midazolam 2ml, Ing Inj metoclopramide 4 mg was given intraoperatively.The patient was preoxygenated with 100% O2 for 3 mins following which Induction of anaesthesia was done by IV propofol 2mg/kg . After loss of consciousness, Inj. Succinycholine was given in a dose of 1.25mg/kg and laryngoscopy done after applying the sellick's manouver followed by intubation. The tube was attached to the mechanical ventilator and the gases delivered on volume control mode. The patient was maintained. Oxygen along with sevoflurane. Inj vecuronium 0.1mg/kg was given for maintainence of neuromuscular block. The surgery lasted for 3 hrs. Intraoperatively an ABG was done which revealed the following Ph 7.32, PCo2 66, PO2 85, HCO3 22.4. At the time of extubation Inj. Neostigmine 2.5mg and Inj. Glycopyrrolate 0.5mg was given. The patient was extubated in a deeper plane of anaesthesia. Post operatively the vitals remained stable and the pain was managed by IV paracetamol as the epidural catheter's placement was doubtful.

Discussion : Diaphragmatic hernia in an adult is a rare finding and it's anaesthetic management an even rarer one. Bochdalek hernias were first described by bochdalek in 1848, and are charecterised by a weak postero lateral wall.[2,5] Diaphragmaic eventration is there when there is abnormal displacement, which means elevation, of an intact diaphragm into the thoracic cavity. Morgagni hernia is herniation through the foramen of morgagni adjacent to the xiphoid process of the sternum.(6) A check on the intraabdominal pressure is a prerequisite as an increase in pressure may lead to rupture of the diaphragm. Hence, no bag and mask ventilation was done. Anaesthesia should be of a deep plane as there should be no coughing or straining intra operatively or at the time of extubation. (5)If eventration of the diaphragm becomes a true rupture, direct compression of the heart may occur impairing venous return to the heart and decreasing cardiac output. Thus, an adequate depth of anaesthesia is required in these patients undergoing surgery. Nitrous oxide use should also be avoided as it tends to accumulate and expand in closed spaces and thus facilitate the rise in pressure and indirectly facilitate rupture. A rupture can also occur if the regional block goes high and paralyses the diaphragm.[5,8]

Eventration of the diaphragm is mostly asymptomatic in adults just like in this case. However, clinical diagnosis from the gastrointestinal and respiratory symptoms can be confirmed by X ray chest and CT scan.[8]

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