



TRAUMATIC DIAPHRAGMATIC INJURY: A CASE REPORT

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KEYWORDS :

INTRODUCTION:

Injury to the diaphragm due to blunt trauma is no longer uncommon, as its incidence increases with increase in road traffic accidents. Here we present a case of diaphragmatic injury due to penetrating injury over left side of abdomen by a cow.

Case Report:

A 50 year old male patient presented with a penetrating injury over left side of upper abdomen on 10/08/22, with reported history of herniation of some viscera or bowel loop. On examination Pulse was 96/min, BP-170/90 mmhg and saturation was 99% in room air. Systemic examination revealed tenderness in left lower chest and left lumbar region. There was a stitched linear wound over the left lumbar region. Chest X ray showed fracture of multiple left ribs with bowel loops in left thorax. USG(W/A) was done which showed minimal splenic contusion with left pleural collection. The patient was admitted and all routine investigations done along with HRCT thorax. HRCT thorax revealed 1) evidence of bowel loops seen inside left thoracic cavity, 2) Left basal lung contusion with left sided minimal pleural collection, 3) Fracture of 8-11 rib left side, 4) Part of the mesentery along with fat is seen protruded out into the subcutaneous compartment at the level of posterior end of 8th - 11th rib on left side, 5) Surgical emphysema left lateral abdominal wall.



Figure No. 1 showing fracture of left ribs from 8th to 11th with herniation of bowel loops into the left thoracic cavity.

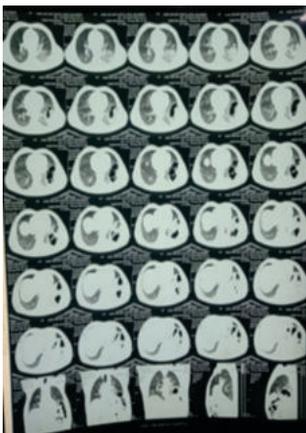


Figure No. 2 showing HRCT Thorax, which reveals traumatic diaphragmatic herniation on left side with multiple rib fracture from 8th to 11th.

MANAGEMENT:

The patient was taken up for exploratory laparotomy under GA on 10/08/22. Left subcostal incision was made. Diaphragmatic injury was identified at the left posterolateral region of size 10x10cm. Omentum and a part of colon was found inside the thorax. Contents were reduced and defect repaired with prolene 1-0. Intercostal drainage tube was placed at 5th intercostal space on left side. Subdiaphragmatic drain placed. Spleen, large and small bowels were found to be healthy. Abdomen closed in layers. After the procedure, the patient was shifted to Intensive Care Unit. After 3 days of ICU care, patient was shifted to ward. The patient recovered and was discharged from the hospital in stable condition.

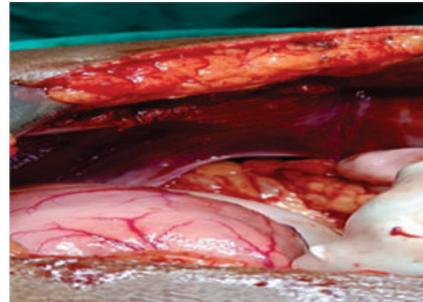


Figure No. 3 showing herniation of omentum with bowel loops through left diaphragm into left thoracic cavity due to penetrating injury.

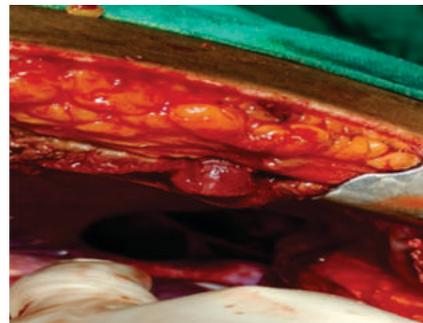


Figure No. 4 showing penetrating injury of left diaphragm.



Figure No. 5 showing repair of left diaphragm with prolene suture

DISCUSSION:

Diaphragmatic rupture is a life threatening condition. It may be due to penetrating or blunt trauma. It is usually associated with abdominal or might be isolated (1). Diaphragmatic rupture with abdominal organ herniation was first described by Sennertus in 1541. Diaphragmatic injury can occur as a consequence of high velocity blunt and penetrating trauma to abdomen or chest (2).

Blunt trauma to the abdomen increases the transdiaphragmatic pressure gradient between the abdominal compartment and thorax (3). This causes shearing of a stretched membrane and avulsion of diaphragm from its points of attachments due to sudden increase in intra-abdominal pressure, transmitted through the viscera (4). Traumatic diaphragmatic hernia is a frequently missed diagnosis and there is commonly a delay between trauma and diagnosis.

Delayed presentation can be explained by 2 hypothesis – delayed rupture or delayed detection. Delayed rupture may occur when diaphragmatic muscle is devitalised during the initial injury but remains a tenuous barrier until several days later when the inflammatory process weakens it. Delayed detection is explained when the herniation occurs and becomes clinically evident (5).

Grimes first described the 3 phases of rupture of the diaphragm in 1974. First phase (acute phase) is the time of injury to diaphragm. The second – delayed phase is usually asymptomatic where there is a gradual herniation of abdominal contents into the chest. The third – obstruction phase is characterised by bowel or visceral herniation, obstruction, incarceration, strangulation and possible rupture (6).

Diaphragmatic injury can be diagnosed by chest radiographs but it is insensitive, with sensitivity of 46% for left sided rupture and 17% for right sided rupture and it is usually masked by associated findings of pleural effusion, atelectasis, pulmonary contusion or non specific diaphragmatic elevation. CT is the imaging modality of choice with sensitivity of 61-71% and a specificity of 87-100% as an aid for diagnosis of traumatic diaphragmatic rupture. CT scan show discontinuity of diaphragm, intrathoracic herniation of abdominal contents and waist like constriction of bowel which is called collar sign. And also dependent viscera sign which is the abutment of liver to the posterior right ribs or the bowel or stomach to lay in contact with posterior left ribs (7).

Diaphragmatic injury repair is usually performed by laparotomy or a thoracotomy incision. Laparoscopy became the modality of choice to diagnose diaphragmatic rupture as it is therapeutic too (8).

CONCLUSION:

Although diaphragmatic injury always goes unnoticed, careful interpretation of chest x-ray and with proper history of mechanism of injury, it can be diagnosed. And early treatment of repair of diaphragmatic injury if started before development of respiratory symptoms is done, the mortality rate can be decreased.

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