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Diaphragmatic injury post blunt trauma precipitating a year later as tension fecopneumothorax and left liver lobe herniation: Lesson to learn

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Abstract

Bowel perforation leading to feco-pneumothorax is rare yet serious acute emergency with poor prognosis, requiring urgent surgical intervention and often intensive postoperative care. Worldwide, there are a handful of case reports of missed post traumatic diaphragmatic hernia of which feco-pneumothorax as presentation is even rarer. Here, we report a case of 38 years old male who following RTA one year ago developed left side hemopneumothorax with 4th–6th rib fracture with right shaft of femur fracture, which was managed by left ICD, open reduction with internal fixation of shaft of femur, antibiotics & analgesics. He was then discharged after uneventful hospitalization. Patient was asymptomatic in interim until one day, he presented to emergency and diagnosed with feco-pneumothorax due to perforation of herniated bowel along with herniation of falciform ligament and segment of left liver lobe through an anteromedial diaphragmatic rent.

Keywords: Diaphragm, trauma, thorax, hernia, fecopneumothorax, emergency

Introduction

Post blunt trauma diaphragmatic hernia is an infrequent occurrence, reported in ~0.8-5% of blunt thoraco-abdominal injury^[1]. It is difficult to detect and can cause significant future complications and mortality owing to abdominal viscera herniation in thoracic cavity, viscera strangulation and cardiopulmonary compromise^[2].

Bowel perforation leading to feco-pneumothorax is rare yet serious acute emergency with poor prognosis, requiring urgent surgical intervention and often intensive postoperative care. Worldwide, there are a handful of case reports of missed post traumatic diaphragmatic hernia of which feco-pneumothorax as presentation is even rarer^[2]. Here, we report a case of feco-pneumothorax due to perforation of herniated bowel along with herniation of falciform ligament and segment of left liver lobe.

Case report

A 38-year man presented to emergency with diffuse severe pain abdomen, vomiting and chest pain with respiratory distress for 3 days and obstipation for 2 days. He had no comorbidities. There was no history of recent trauma, however he suffered RTA 1 year ago when he was diagnosed with left side hemopneumothorax with 4th–6th rib fracture with right shaft of femur fracture which was managed by left intercostal tube drainage, open reduction with internal fixation of shaft of femur, antibiotics & analgesics. He was then discharged after uneventful hospitalization. Patient was asymptomatic in interim until present distress.

On admission, GCS 15/15, blood pressure: 138/82 mm Hg, pulse: 106 beats per minute, respiratory rate: 28 cycles per minute, temperature: 37.5 °C. General physical examination was unremarkable. On respiratory system examination, reduced movement of left hemithorax, trachea shifted to right, air entry absent on left side. On per abdominal examination, abdomen was distended, with generalized tenderness without guarding/rigidity. No lump, no shifting dullness/thrill, bowel sounds sluggish.

Routine hematological investigations were within normal limits. Chest X-ray (Figure 1) showed left hemithorax opacity with lower lobe gas shadow and mediastinal shift to opposite side. CECT Thorax (Figure 2) demonstrated diaphragmatic herniation of heterogeneously enhancing small intestine loops into left pleural cavity with left lung collapse and left pleural effusion.

Patient underwent exploratory laparotomy, no intraabdominal contamination was found. An anteromedial diaphragmatic rent (4×3 cm) through which omentum and distal ileal loops were herniating. There was simultaneous herniation of falciform ligament and lateral segment of left liver lobe (Figure 3.A). A 1.5x2.5 cm perforation was found along with gangrenous segment of distal ileum along with gross left intrathoracic fecal contamination noted but no intra-abdominal contamination (Figure 3.B). Contents were reduced back to abdominal cavity and extensive lavage of left pleural cavity done with intercostal drainage tube placement. Resection of herniating omentum and perforated gangrenous distal ileum loop with ileoileal anastomosis and primary repair of anteromedial diaphragmatic rent done using Prolene 1.0 CRB.

In postoperative period, respiratory function improved, ICD output gradually reduced to minimal and removed on 8th post operative day. Patient was discharged on 10th postoperative day and was asymptomatic during 6-months follow-up.

Discussion

Missed Diaphragmatic injury post blunt trauma, though rarely reported with complication in literature, may present with emergencies such as strangulation & perforation like in our case. Hence efforts should be made for prompt diagnosis of subclinical diaphragmatic injury, especially in asymptomatic polytrauma cases. This is only possible with a high degree of suspicion at the time of presentation.

Defects tend to occur at potentially weak areas along embryological fusion points due to sudden increase in intra-abdominal pressure [1]. From previous literatures, most common site is musculotendinous junction in posteromedial aspect of the hemidiaphragm but in our case it was present in antero-medial aspect [3]. The left hemidiaphragm is more commonly involved irrespective of mechanism, blunt or penetrating [4]. Other important point to gather from previous literatures is the nature of content herniating through the defect. Stomach (31.8%), colon (27%), Omentum (16%), small intestine (13.6%), spleen (6.8%) and liver (4.5%) are common herniating viscera, often undergoing incarceration and strangulation [2]. In our case, there was herniation of falciform ligament and segment of left liver lobe in addition to herniating small bowel loops.

Tension fecopneumothorax due to intrapleural perforation of intestine is a dreaded complication, with only few cases reported worldwide [5, 7]. CECT serves as best diagnostic modality [3]. Fecopneumothorax can further lead to a fully established pneumonia with pleural empyema which in turn requires drain and debridement via thoracotomy. In fact repetitive surgical debridement may be needed in order to control local and systemic sepsis [6].

Primary repair of diaphragmatic defect is often indicated. However, larger defects warrant use of prosthetic or biological mesh over non-reabsorbable variants in septic cases. Even on delayed presentation, laparoscopic management of traumatic diaphragmatic hernia appears promising [7]. Mortality (25-60%) remains high despite urgent intervention.



Fig 1: Heterogenous Radio-opacity of Left hemithorax with contralateral shift of mediastinum

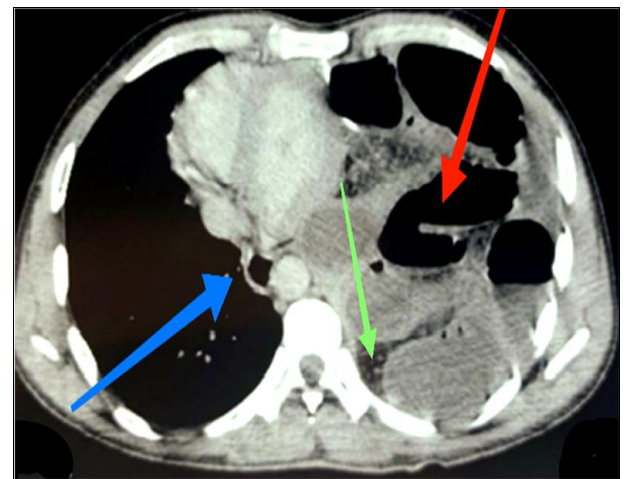


Fig 2: Axial section of CECT Thorax showing herniation of heterogeneously enhancing small intestine loops (RED ARROW) into left hemithorax with collapsed left lung. There is free fluid in left hemithorax (GREEN ARROW) and shifting of mediastinum to opposite side (BLUE ARROW)

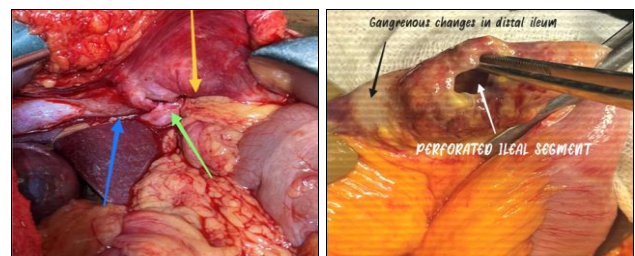


Fig 3: Intraoperative images showing - [A] diaphragmatic rent (YELLOW ARROW), herniating ileal loop (GREEN ARROW) & falciform ligament along with a segment of left lobe of liver (BLUE ARROW); [B] Black arrow shows gangrenous changes and white arrow shows perforation in herniated ileal segment

Conclusions

Diagnosis of subclinical diaphragmatic injury in blunt trauma with distracting injuries can be missed, which latter can lead to fatal complications like tension fecopneumothorax in rare cases. Hence, evaluation of thoracoabdominal injuries warrants ruling out occult diaphragmatic injury and preventing treatment delay due to diagnostic difficulties. High index of suspicion both clinically & radiologically can therefore reduce the morbidity and mortality associated with the condition.

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Ethical approval: Not required

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