

Post-Traumatic Left Diaphragmatic Hernia: A Case Report

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Abstract

Post-traumatic diaphragmatic hernia is an uncommon injury seen mainly as a result of high velocity trauma, such as in road traffic accidents. The sudden compression of the lower chest or upper abdomen can cause a tearing of the diaphragm, leading to the herniation of abdominal contents into the chest cavity. It can occur as a result of either blunt or penetrating chest or abdominal injuries. It is more common on the left side. Post-traumatic diaphragmatic hernia typically presents with dyspnea and abdominal pain. Computed tomography is the modality of choice for diagnosis. We present the case of a 25-year-old male patient who sustained a left-sided post-traumatic diaphragmatic hernia following a motor vehicle accident. This case highlights the importance of considering diaphragmatic injuries in trauma patients, particularly in the context of blunt abdominal trauma, and highlights the role of imaging in timely diagnosis and appropriate management.

Keywords: Post-Traumatic Diaphragmatic Hernia; Trauma; Injury; Computed Tomography

Introduction

A diaphragmatic hernia is defined as an abnormal communication between the abdominal cavity and the thorax through a hernial orifice. It may be congenital or acquired. Post-traumatic diaphragmatic hernia is a rare consequence of thoraco-abdominal trauma [1], most commonly in blunt trauma and less commonly in penetrating trauma [2]. The left side is more commonly affected than the right because of the congenitally stronger right hemidiaphragm and protection by the liver. Clinical presentation varies; the patient may be completely asymptomatic or present with acute symptoms such as dyspnea due to compression of the lung parenchyma, abdominal pain and diminished breath sounds on the affected side [3]. Presentation may be delayed, leading to increased morbidity and mortality [4]. Thoracoabdominal CT scan is the preferred diagnostic modality, showing discontinuity of the hemidiaphragm and intrathoracic herniation of abdominal contents. Treatment involves surgical intervention and prognosis depends on the associated injuries.

Case Presentation

A 25-year-old man with no past medical history presented to our emergency department with thoracoabdominal trauma following a motor vehicle collision. On presentation, the patient complained of pain in the left side of the chest, abdomen and pelvis. On examination the patient had a GCS score of 15/15, BP: 11/7 mmHg, tachycardia (120 bpm) and tachypnea (28 breaths/min). Abdominal examination

showed slight tenderness, chest examination showed decreased breath sounds in the left lower hemithorax. The rest of the examination was unremarkable.

The contrast-enhanced CT scan of the abdomen and thorax showed a 7 cm defect at the level of the left diaphragm with intrathoracic protrusion of the stomach, splenic flexure of the colon and some loops of small bowel (Figure 1). Pelvic fractures were also observed (Figure 2).



Figure 1: Contrast-enhanced CT of the abdomen and chest showing a left diaphragmatic hernia. A: Gastric content in the left hemithorax (Star). B: Pulmonary window showing air fluid level (asterixis). C: Herniated bowel loops (Blue arrow) and the splenic flexure of the colon (Green arrow).



Figure 2: 3D reconstruction of pelvic CT: Unveiling multiple fractures.

Based on the imaging findings, the patient was admitted to surgery for further evaluation. A laparoscopy was performed which confirmed the left diaphragmatic hernia with the presence of the stomach, splenic flexure of the colon and some loops of small bowel intra-thoracically, confirming the diagnosis of a left post-traumatic diaphragmatic hernia.

The surgical procedure consisted of reduction of the hernia contents into the peritoneal cavity after assessment of vascularity and suturing of the diaphragmatic defect. The postoperative course was uneventful and the patient made a good recovery.

Discussion

Post-traumatic diaphragmatic hernia is defined as the displacement of abdominal organs into the thoracic cavity through a tear in the diaphragm. It is primarily observed as a result of high velocity trauma and can result from both blunt and penetrating trauma. Its incidence is relatively low, ranging from 1.2% to 5% [5].

The mechanism of injury is the rupture of the stretched diaphragm at its attachment point, caused by the abrupt transmission of force through the abdominal viscera. The left hemidiaphragm is more frequently involved due to the protective effect of the liver on the right side [6]. In addition, the most commonly herniated organs include the stomach, colon, small intestine, spleen, and kidney on the left side, and occasionally the liver and colon on the right side.

The clinical presentation varies; the patient may be completely asymptomatic or present with acute symptoms including dyspnea, chest pain, and upper abdominal pain [7]. In some cases, post-traumatic diaphragmatic hernia may be delayed for months or even years, and the diagnosis may be made when complications such as bowel obstruction and perforation occur [8].

Diagnosis is confirmed by imaging. Chest radiography may appear normal or may show non-specific signs such as an elevated hemidiaphragm and the presence of intestinal gas in the chest cavity, accompanied by a shift of the mediastinum to the contralateral side [9]. CT of the chest and abdomen is the modality of choice for diagnosis. This imaging modality facilitates visualization of the hernia contents and measurement of the diaphragmatic defect. Additionally, abdominal CT provides further utility by aiding in the exclusion of injuries to solid organs and other hollow viscera [10].

The differential diagnosis may include pneumothorax, other traumatic chest injuries (rib fractures, pulmonary contusions), other types of diaphragmatic hernia (Bochdalek hernia, hiatal hernia), and diaphragmatic eventration. A combination of clinical assessment and imaging studies is used to differentiate between these entities.

The management of post-traumatic diaphragmatic hernia is primarily surgical. It involves reduction of the herniated organs to their normal position, repair of the diaphragmatic defect, and appropriate drainage if necessary [11]. Surgical management differs depending on the side affected. Left post-traumatic diaphragmatic hernias should be operated on via the abdominal approach. Thoracotomy remains the approach for right diaphragmatic hernia [12]. Regular medical follow-up is essential to monitor recovery, detect potential complications, and adjust the treatment plan if necessary.

Conclusion

Post-traumatic diaphragmatic hernia should be considered in cases of thoracoabdominal injury. However, its diagnosis is often delayed due to lack of awareness, leading to potentially life-threatening complications such as respiratory failure and bowel obstruction. CT scan is the gold standard for confirming the diagnosis. Treatment typically involves surgical intervention, with surgical strategies tailored to factors such as the location and size of the diaphragmatic defect, the presence of associated injuries, and the overall stability of the patient.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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