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A Delayed Presentation of Traumatic Diaphragmatic Hernia with Large Bowel Obstruction

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Abstract
Diaphragmatic injury is a rare occurrence, constituting less than 3 percent of all traumatic injuries. It typically arises from either blunt or penetrating trauma, presenting a notable challenge in clinical settings, with a 2:1 ratio of penetrating to blunt trauma[(1)]. These injuries often elude immediate recognition or face delayed diagnosis, primarily due to their infrequency and the concurrent presence of more overt and severe traumas in patients. The delayed identification of diaphragmatic injuries can contribute to complications such as pulmonary issues, persistent abdominal pain, or acute bowel obstruction, thereby elevating the risk of morbidity and mortality. Here, we report a case of a 30-year-old man who exhibited a diaphragmatic hernia with large bowel obstruction which manifested following blunt abdominal and thoracic trauma that occurred three years prior to the current presentation.

Case Report

A 30-year-old male presented to the emergency department with complaints of abdominal distension and constipation, without any associated signs of rectal bleeding. His hemodynamic status was stable, and abdominal examination showed no evidence of peritoneal irritation. Radiographic assessment, including an abdominal X-ray, disclosed the presence of dilated small bowel loops exhibiting multiple air-fluid levels. Furthermore, the chest X-ray revealed bowel loops within the left thoracic cavity, along with multiple fractures observed in the left-sided ribs.

Upon conducting a thorough inquiry into the patient's medical history, it was revealed that a history of blunt trauma to the thorax and abdomen existed. Subsequent verification of the patient's archival medical records unveiled a prior road traffic accident marked by multiple left-sided rib fractures and a Grade II splenic injury. In response to this information, an emergency contrast-enhanced CT scan of the thorax and abdomen was expeditiously undertaken.

Figure I chest X-ray shows bowel loops on the left side of the thoracic cavity.

Figure II- Abdomen Xray with multiple air fluid levels.

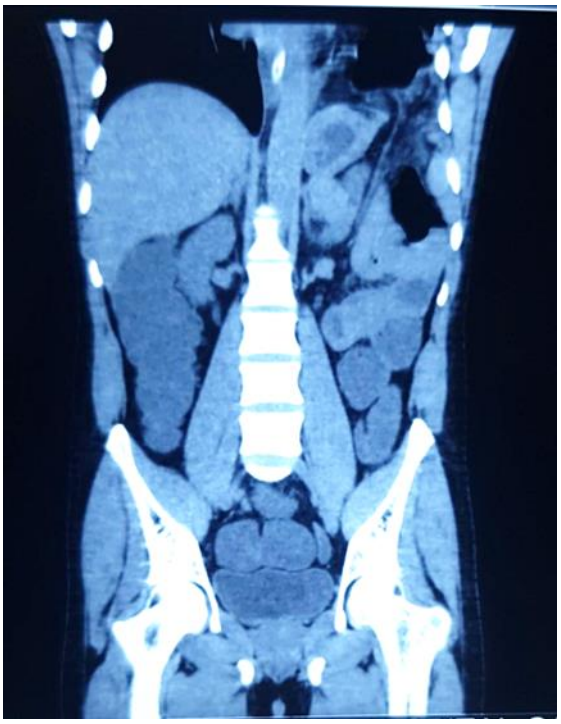

Figure III CT image showing defect in diaphragm with herniation of bowel

The CT scan revealed the herniation of the transverse colon into the left thoracic cavity through a 5x5 cm defect in the diaphragm. Subsequently, the patient was promptly taken to the emergency operating room for exploration. During the surgical procedure, the transverse colon and greater omentum were identified herniating through the diaphragmatic defect. Notably, the spleen was grossly found to be unremarkable.

The herniated contents were successfully reduced, and the diaphragmatic defect was closed primarily in two layers. The closure involved the initial placement of horizontal mattress sutures, followed by reinforcement with a second layer using 1-0 prolene. A left-sided intercostal drain tube of size 28F was inserted.

On the third postoperative day, the chest tube was removed, and the patient demonstrated satisfactory recovery, leading to discharge on the fifth postoperative day.

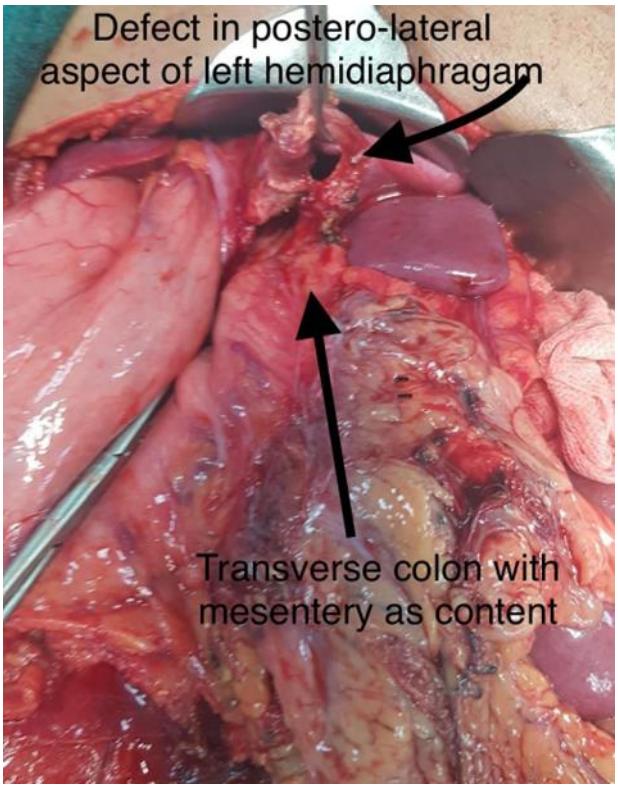

Figure IV Intraoperative image showing defect in diaphragm

Discussion

While diaphragmatic hernia is a recognized medical condition, its association with bowel obstruction is exceptionally rare. Even in patients undergoing laparotomy, there is still a risk of overlooking the diaphragmatic defect. The rate of initially missed diaphragmatic injuries during the treatment of combined thoracoabdominal injuries can be as high as 66%[(2)].

It is more common in males, with a ratio ranging from 1.5:1 to 4.5:1[(3)]. This rarity is particularly notable in posttraumatic hernias, which typically present acutely with symptoms such as respiratory distress and multiple visceral herniations. While the stomach is commonly implicated, instances involving the spleen, small intestine, large intestine, and omentum have also been documented. Spontaneous closure of a rupture does not occur, although a temporary closure may take place via muscular contraction or omental interposition[(4)].

A congenital weakness along the embryonic fusion of the costal and lumbar portions of the diaphragm predisposes the left hemidiaphragm to a greater incidence of injury from blunt trauma [(5)]. This condition has an incidence as high as 5% for patients hospitalized after motor vehicle accidents and 15% for patients after penetrating injuries to the lower chest and upper abdomen[(6)]. Computed tomography is the investigation of choice, and it can detect subtle herniation. In hemodynamically unstable patients with other minor abdominal organ injuries, angiography is suggested to rule out aortic injuries[(7)].

Typically, when an acquired diaphragmatic hernia is identified following recent trauma, surgeons opt for laparotomy through an abdominal approach. However, in instances where the diagnosis is incidental, emerging months or years after the trauma, many surgeons favor the thoracic or thoracoabdominal approach. This preference is particularly apparent when the hernia content has adhered to thoracic structures. In the present case, we chose the abdominal approach due to the patient's signs of bowel obstruction, and if any resection were required, it could be easily performed through this approach. The laparoscopic approach is also amenable in diaphragmatic hernia and has the advantage of a shorter hospital stay[(8)].

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