PriMera Scientific
Medicine and Public Health
Volume 7 Issue 2 August 2025
ISSN: 2833-5627

Late Complication of Diaphragmatic Injury

Type: Case Report
Received: June 03, 2025
Published: August 01, 2025

Citation:
Omer Hamza Ali. "Late Complication of Diaphragmatic Injury". PriMera Scientific Medicine and Public Health 7.2 (2025): 14-16.

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Abstract

Traumatic diaphragmatic injury is not an uncommon consequence of blunt or penetrating trauma to the abdomen or thorax. It may present acutely with hemodynamic and respiratory compromise and may be associated with significant injuries to other organs. However, it can also be missed during the initial trauma evaluation and manifest later as a diaphragmatic hernia with severe complications [1].

Introduction

Traumatic rupture of the diaphragm is an uncommon but significant condition, occurring in 0.8% to 5% of patients admitted with thoracoabdominal trauma. The most common causes are blunt trauma, such as motor vehicle accidents, and penetrating injuries. Organs typically involved in right-sided diaphragmatic hernias include the colon, omentum, small intestines, and liver. Chest radiography and computed tomography (CT) are the most effective diagnostic tools. Surgical treatment involves reduction of herniated viscera and repair of the diaphragmatic defect using non-absorbable sutures [2].

Diaphragmatic injuries may present acutely or be delayed. These injuries are classified into three clinical phases: acute, latent, and obstructive. In the acute phase, the injury occurs with the trauma but may be masked by other injuries. The latent phase involves non-specific symptoms, such as those mimicking peptic ulcer disease or gallbladder disease. The obstructive phase includes symptoms of bowel obstruction after incarceration of herniated bowel. Strangulation is the most serious complication and warrants prompt surgical intervention. Surgical approaches include laparotomy or thoracotomy [3].

Case Presentation

An 18-year-old male with a history of a stab wound to the left side of the chest one year prior, presented with cardinal features of intestinal obstruction and symptoms of chest compromise. The patient was vitally unstable, with signs mimic hemo-thorax; a chest tube was inserted, which drained an offensive greenish fluid. A chest X-ray revealed a collapsed left lung and bowel loops within the left hemithorax (Figure 1).

Figure 1: Chest X-ray after the chest tube insertion and before the laparotomy.

Emergency laparotomy was performed; revealing a large segment of gangrenous, perforated bowel herniated through a diaphragmatic defect into the chest. The proximal herniated bowel was markedly distended, obscuring the operative field, and was decompressed. The distal segment was collapsed. Reduction of the bowel was performed (see video: https://drive.google.com/file/d/1-RW-6WhYvYUDdxplObzHBurIO_jJCSVCd/view?usp=drivesdk).

The thoracic cavity was irrigated with normal saline, and the diaphragmatic defect was repaired with non-absorbable sutures. Extended right hemi- colectomy for the gangrenous bowel done figure (2). A drain, nasogastric tube, and chest tube were placed.

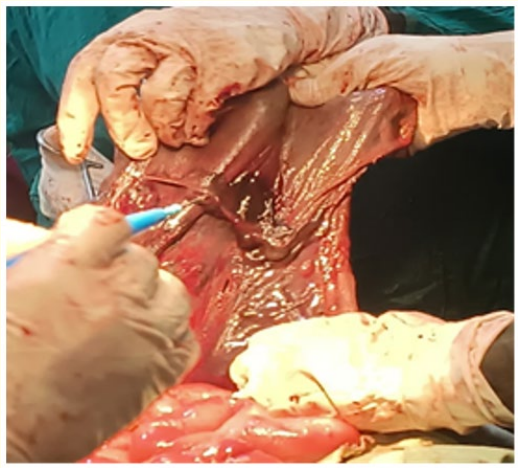

Figure 2: Demonstrates the resection of gangrenous bowel.

The patient was admitted to the ICU and intubated, then transferred to the ward on the third postoperative day. Chest X-rays were used for follow-up (Figure 3). He was discharged in good condition after 17 days with plans for ileostomy reversal after 10 weeks.

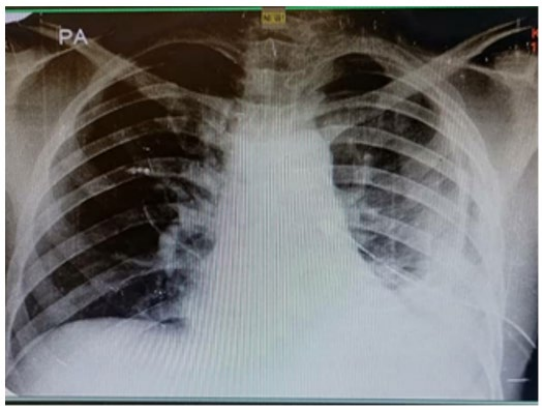

Figure 3: Chest x-ray five days after the laparotomy.

Discussion

As discussed, diaphragmatic injuries following trauma are not uncommon, but they are frequently misdiagnosed during the acute phase. In this case, the patient had a history of penetrating chest trauma one year prior and presented later with a strangulated diaphragmatic hernia. The herniated bowel had perforated, causing severe complications. This progression can be attributed to the pressure gradient between the abdominal and thoracic cavities, which can enlarge an unrecognized diaphragmatic defect over time.

Early diagnosis and management of diaphragmatic injuries are crucial in preventing such life-threatening complications. The choice of surgical approach depends on the mechanism of injury, patient stability, and timing of presentation. Primary repair with non-absorbable sutures is often preferred due to its lower risk of infection and recurrence compared to mesh repair. Although mesh (e.g., polytetrafluoroethylene, polypropylene) is commonly used for large defects, complications such as infection and hernia recurrence have been reported. Recent biologic materials derived from porcine dermis have been suggested, but further studies are needed [3].

References

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