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Post-Traumatic Diaphragmatic Rupture: A Case Report

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Abstract **Case Report**

Traumatic diaphragmatic rupture is a rare entity that typically occurs in the setting of high-energy blunt trauma, and its diagnosis in the acute phase remains challenging due to non-specific clinical presentation. We report the case of a 50-year-old male with no significant past medical history who was admitted for abdominopelvic trauma following a road traffic accident involving a motorcycle–car collision. On admission, the patient was conscious and hemodynamically stable, with clinical examination revealing pelvic ecchymosis and mild abdominal tenderness. Laboratory investigations showed leukocytosis of 20,000/mm³. Contrast-enhanced thoracoabdominal computed tomography demonstrated a left diaphragmatic rupture with herniation of the gastric fundus through a 50 mm defect, associated with moderate intraperitoneal fluid. The patient underwent a midline laparotomy with reduction of the herniated stomach and primary repair of the diaphragmatic defect using interrupted 2/0 silk sutures, along with abdominal and thoracic drainage. The postoperative course was uneventful, and the patient was discharged on postoperative day five. Traumatic diaphragmatic rupture should be suspected in high-energy thoracoabdominal trauma, and computed tomography plays a key role in early diagnosis, allowing prompt surgical management and improved outcomes.

Keywords: Traumatic diaphragmatic rupture; Blunt trauma; Laparotomy.

INTRODUCTION

Traumatic diaphragmatic rupture is a rare complication of blunt thoracoabdominal trauma, with an incidence ranging from 0.8% to 5% [1]. It most commonly occurs in the setting of high-energy trauma, particularly road traffic accidents.

Left-sided diaphragmatic injuries are more frequently reported, mainly due to the relative weakness of the left hemidiaphragm and the protective effect of the liver on the right side [2].

The diagnosis in the acute phase remains challenging because of non-specific clinical manifestations, leading to delayed diagnosis and potentially severe complications such as visceral strangulation or necrosis [1,3]. Computed tomography (CT) is currently considered the gold standard imaging modality for diagnosis [3].

We report a case of post-traumatic left diaphragmatic rupture with gastric herniation, diagnosed early and successfully managed surgically.

OBSERVATION

A 50-year-old male with no significant past medical history was admitted to the emergency department following a road traffic accident involving a motorcycle–car collision, resulting in abdominopelvic impact.

On admission, the patient was conscious and hemodynamically stable. Physical examination revealed ecchymosis over the pelvic region. The abdomen was soft with mild tenderness, without guarding or rebound tenderness.

Laboratory investigations showed leukocytosis (20,000/mm³), hemoglobin level of 13.1 g/dL, C-reactive protein of 3 mg/L, normal coagulation profile (prothrombin time: 100%), urea of 0.41 g/L, and creatinine of 14.15 mg/L. Electrolyte analysis revealed mild hypokalemia (3.32 mmol/L) and sodium level of 135 mmol/L.

Contrast-enhanced thoracoabdominal CT scan revealed a left diaphragmatic rupture with herniation of the gastric fundus through a defect measuring approximately 50 mm, associated with moderate intraperitoneal fluid.

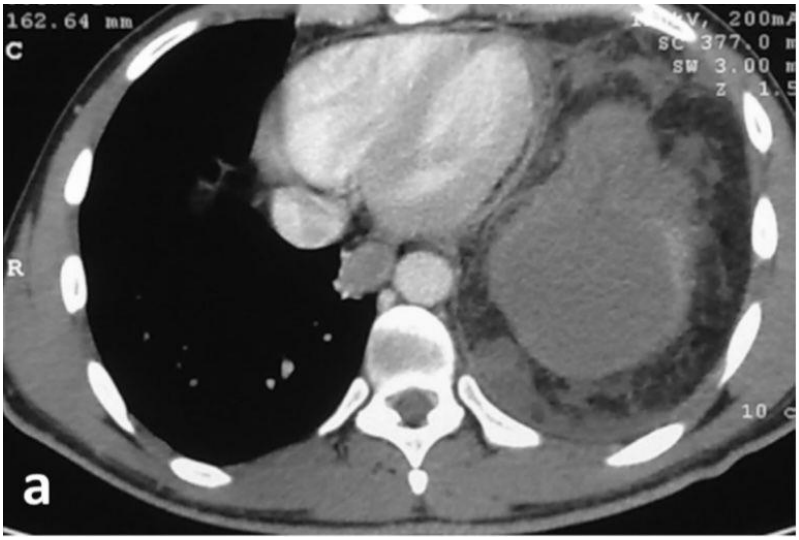

Figure 1: CT scan showing diaphragmatic rupture

Surgical intervention was indicated. The patient underwent a midline laparotomy. Intraoperative findings confirmed a left diaphragmatic defect with intrathoracic herniation of the gastric fundus.

The surgical procedure consisted of reduction of the herniated stomach and primary closure of the diaphragmatic defect using interrupted 2/0 silk sutures. Abdominal drainage was performed, along with placement of a thoracic drain.

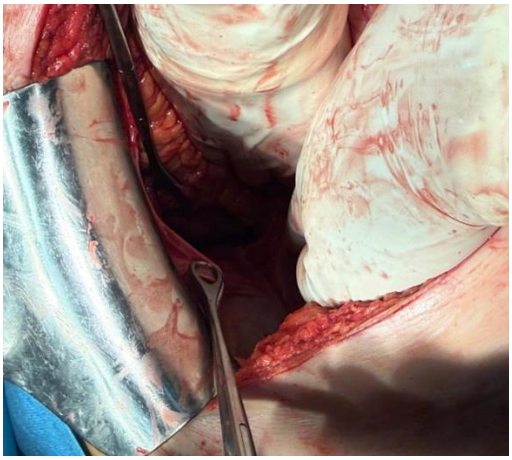

Figure 2: Intraoperative view of the diaphragmatic defect

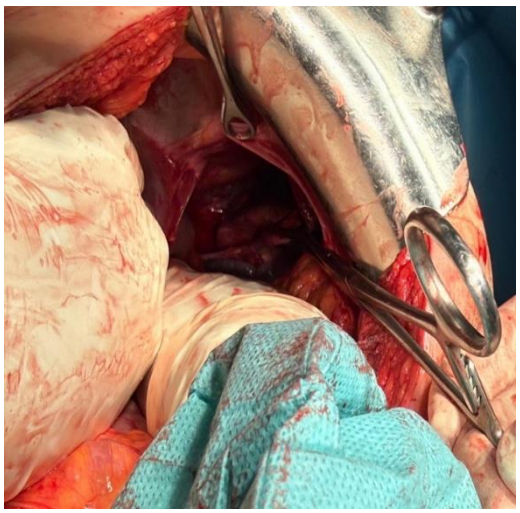

Figure 3: Intraoperative view of the diaphragmatic defect

The postoperative course was uneventful, with favorable clinical evolution. The patient was discharged on postoperative day five.

Discussion

Traumatic diaphragmatic rupture results from a sudden increase in intra-abdominal pressure following high-energy trauma [2,4]. Road traffic accidents remain the leading cause [4].

Left-sided injuries are more common due to the anatomical vulnerability of the left hemidiaphragm and the absence of hepatic protection [2,4].

Clinical diagnosis is often difficult, especially in hemodynamically stable patients, as illustrated in our case. CT scan is the imaging modality of choice, with a reported sensitivity ranging from 61% to 87% [3]. Typical findings include diaphragmatic discontinuity, herniation of abdominal viscera into the thoracic cavity, and the "collar sign" [3].

Management is exclusively surgical and should be performed promptly to prevent complications such as strangulation or necrosis of herniated organs [1]. Midline laparotomy remains the preferred approach in the acute setting, allowing thorough exploration and management of associated injuries [4].

Primary repair using non-absorbable sutures is the standard technique. Thoracic drainage is commonly associated to prevent pleuropulmonary complications [4].

In our case, early diagnosis and prompt surgical management resulted in an uneventful recovery.

Conclusion

Traumatic diaphragmatic rupture is a rare but potentially life-threatening condition that requires a high index of suspicion in patients with high-energy thoracoabdominal trauma. Computed tomography plays a crucial role in early diagnosis. Prompt surgical management significantly improves patient outcomes.

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