

Delayed Presentation of Traumatic Diaphragmatic Hernia Complicated by Gangrene: A Case Report and Review of Literature

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ABSTRACT

Blunt trauma to the abdomen can lead to various injuries, including diaphragmatic ruptures. Late presentation of traumatic diaphragmatic hernia is unlikely and can cause abdominal visceral perforation or gangrene. A young female presented to the emergency department with a history of blunt trauma to the chest 3 years ago, though no hospital admission was reported. Intraoperative findings showed proximal two-thirds of the body of the stomach (60%) and omentum herniated through a 10 × 7 cm rent in the left diaphragm into the thoracic cavity. The herniated part of the stomach was gangrenous. She underwent partial gastrectomy, Roux-en-Y gastrojejunostomy, and enteroenterostomy. The left tube thoracostomy was done and diaphragmatic rent was repaired with prolene 1 in a continuous manner. The surgical management of delayed traumatic diaphragmatic hernia involves the reduction of the herniated part and the repair of the defect. The preferred surgical access may differ between authors and other dedicated centres.

Key Words: Traumatic diaphragmatic hernia, Roux-en-Y anastomosis, Gangrene.

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INTRODUCTION

A diaphragmatic hernia is defined as a protrusion of abdominal organs into the chest through a defect in the diaphragm.¹ Traumatic diaphragmatic hernia might be the result of penetrating injuries, which are more common (63%), and blunt trauma (37%).² The acute phase of a diaphragmatic injury is characterised by the initial trauma to the diaphragm. The latent phase can last from days to years with absent or nonspecific symptoms. The obstructive phase leads to complications.³ Delayed presentation of traumatic diaphragmatic hernia is uncommon and increases the risk of abdominal visceral perforation or gangrene.⁴

CASE REPORT

A 36-year woman presented with complaints of abdominal pain, vomiting for 6 days, and respiratory distress for 2 days. She recalled the event of blunt trauma to the abdomen following a ground-level fall 3 years back. The impact was on the posterior side of the left chest. No hospital admission or medical records were available.

At the time of presentation at emergency, the patient's vitals were; blood pressure of 80/40 mmHg, pulse of 180 beats per minute, and respiratory rate of 34 breaths per minute. She was afebrile. The patient appeared dehydrated.

Physical examination showed decreased movement in respiration and absent breath sounds on the left side of the chest. Tenderness was present in the upper abdomen, and no gut sounds were audible. Blood profile showed a raised white blood cell count of 29,000/ μ L and serum creatinine of 1.7 mg/dl; apart from this, other blood reports were in the normal range. A large air-fluid level was seen in the left haemithorax along with a collapse of the left lung seen in the chest x-ray (Figure 1). CT scan showed herniation of the stomach into the left haemithorax with a breach in the left haemidiaphragm of 2.8 cm (Figure 2).

Midline laparotomy was undertaken. Intraoperative findings showed proximal two-thirds of the body of the stomach (60%) and omentum herniated through a 10 × 7 cm rent in the left diaphragm into the thoracic cavity. The herniated part of the stomach was gangrenous (Figure 3, 4). After the reduction of contents into the abdominal cavity, the gangrenous part of the stomach was resected. Partial gastrectomy, Roux-en-Y gastrojejunostomy, and enteroenterostomy were performed. The left tube thoracostomy was performed, and the diaphragmatic rent was repaired with prolene 1 in a continuous manner. The patient recovered well in the postoperative phase. The postoperative hospital stay was 2 weeks. One unit of blood was transfused. The patient developed a chest infection, which was treated. The chest tube was removed, and the patient was discharged. The patient was symptom-free at 6 months.

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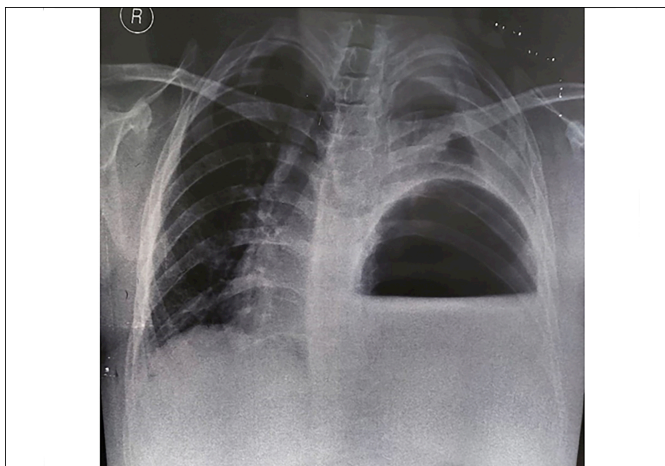


Figure 1: CXR showing a large air-fluid level in the left haemithorax along with a collapse of the left lung.

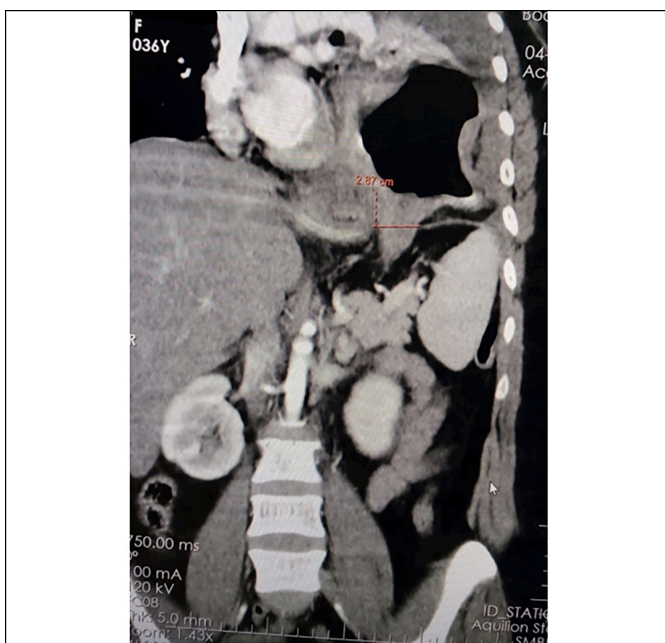


Figure 2: CT-Scan abdomen plain showing herniation of the stomach into the left haemithorax with a breach in the left haemidiaphragm of 2.8 cm (coronal view).

DISCUSSION

The surgical management of delayed traumatic diaphragmatic hernia involves reduction of the herniated part, repair of the defect, and drainage.⁵ More negative pressure in the chest can cause intrathoracic incarceration of abdominal organs through diaphragmatic tear.⁶ Radiological diagnosis is the mainstay for the diagnosis of traumatic diaphragmatic hernias. An initial radiograph of the chest and abdomen should be performed to assess for elevated hemi-diaphragm or bowel gas in the chest cavity, which can raise suspicion of a diaphragmatic hernia. CT scan with contrast has a higher sensitivity and specificity, hence it is the preferred diagnostic modality in patients presenting in an emergency setting.⁷ The x-ray can miss minute injuries in patients with delayed presentation of traumatic diaphragmatic hernia. Thoraco-abdominal CT-scan has a sensitivity of 71-100% and a specificity of 87%.⁸

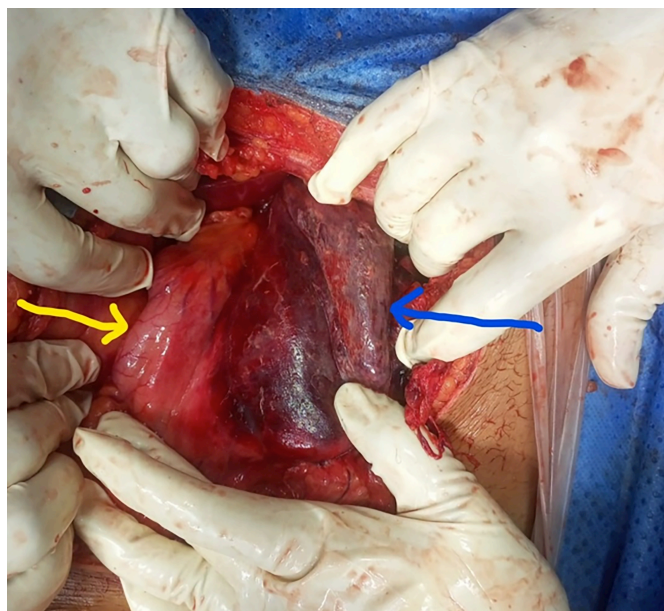


Figure 3: Intraoperative picture of stomach in which blue arrow showing gangrenous part and yellow arrow showing healthy part.

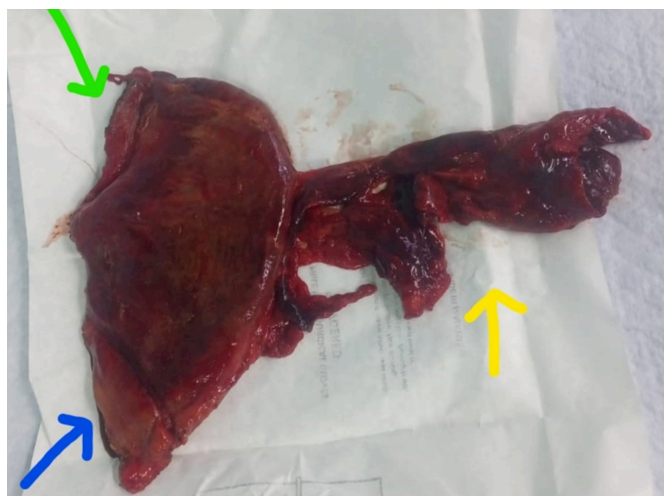


Figure 4: Resected stomach in which green arrow showing proximal margin, blue arrow showing distal margin, and yellow arrow showing omentum.

The surgical approach for managing traumatic diaphragmatic hernia varies based on the timing of presentation, the location of associated injuries, and the surgeon's expertise. Both thoracotomy and laparotomy incisions are the options for open repair techniques.⁹ In cases of diaphragmatic hernia along with abdominal visceral injury, laparotomy is the gold standard approach. Adhesions are encountered in long-standing hernias; hence thoracotomy is preferred as adhesiolysis of intra-abdominal viscera is feasible.¹⁰ Laparoscopic repair for delayed traumatic diaphragmatic hernia was reported in a 55-year male who had a history of trauma 8 months back. He underwent repair of the diaphragm and total gastrectomy, as the fundus and corpus of the stomach were necrotic. The patient made an uneventful recovery.¹¹

Primary suturing of diaphragmatic defect is considered safe with a low recurrence rate, while for larger defects *i.e.* $>25 \text{ cm}^2$,

mesh is recommended.¹² Delayed traumatic diaphragmatic hernias are rare but potentially life-threatening and require immediate diagnosis and early intervention. This case mainly emphasises the diagnosis of diaphragmatic hernias in patients with unclear history of trauma. Sometimes the magnitude may be very trivial. The preferred surgical access may differ between authors and dedicated centres.

PATIENT'S CONSENT:

The patient provided written informed consent.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

HMA, TSS: Substantial contributions to the conception and design of the work and manuscript writing.

AR, FJ: Contributions to the conception, design of the work, and revision of the manuscript critically for the important intellectual content.

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REFERENCES

1. Chandrasekharan PK, Rawat M, Madappa R, Rothstein DH, Lakshminrusimha S. Congenital Diaphragmatic hernia - A review. *Matern Health Neonatol Perinatol* 2017; **3**:6. doi: 10.1186/s40748-017-0045-1.
2. Carmichael SP, Mowery NT, Martin RS, Meredith JW. Management of acute trauma. In: Townsend CM, Ed. *Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice*, 21st ed. St. Louis, MO: Elsevier - Health Sciences Division, 2021:386-428.
3. Rashid F, Chakrabarty MM, Singh R, Iftikhar SY. A review on delayed presentation of diaphragmatic rupture. *World J Emerg Surg* 2009; **4**:32. doi: 10.1186/1749-7922-4-32.
4. Giuffrida M, Perrone G, Abu-Zidan F, Agnoletti V, Ansaloni L, Baiocchi GL, et al. Management of complicated diaphragmatic hernia in the acute setting: A WSES position paper. *World J Emerg Surg* 2023; **18**(1):43. doi: 10.1186/s13017-023-00510-x.
5. Deng X, Deng Z, Huang E. Surgical management of traumatic diaphragmatic hernia: A single institutional experience of more than two decades. *BMC Surg* 2021; **21**(1):142. doi: 10.1186/s12893-021-01141-2.
6. Simon LV, Lopez RA, Burns B. Diaphragm rupture. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2025.
7. Traore A, Konate M, Diarra A, Tounkara I, Traore M, Doumbia A, et al. Traumatic diaphragmatic injury at Gabriel Toure university hospital, Mali. *Surg Sci* 2022; **13**(03): 110-8. doi: 10.4236/ss.2022.133015.
8. Shrestha O, Basukala S, Karki S, Thapa N, Joshi N, Shrestha L, et al. Diaphragmatic rupture secondary to trauma from falling sacks: A case report. *Clin Case Rep* 2023; **11**(6): e7427. doi: 10.1002/ccr3.7427.
9. Yunus Shah M, Abdrabou AA, Obalappa P. Delayed presentation of post-traumatic multiorgan left diaphragmatic hernia: A case report and literature review. *Cureus* 2022; **14**(7):e26814. doi: 10.7759/cureus.26814.
10. Campos Costa F, Cardoso V, Monteiro AM, Guerreiro J. Laparoscopic repair of an acute traumatic diaphragmatic hernia: Clinical case. *Cureus* 2020; **12**(10):e11082. doi: 10.7759/cureus.11082.
11. Kori M, Endo H, Yamamoto K, Awano N, Takehana T. Laparoscopic repair and total gastrectomy for delayed traumatic diaphragmatic hernia complicated by intrathoracic gastric perforation with tension empyema: A case report. *Surg Case Rep* 2022; **8**(1):117. doi: 10.1186/s40792-022-01477-8.
12. Tessely H, Journe S, Therasse A, Hossey D, Lemaitre J. A case of colon necrosis resulting from a delayed traumatic diaphragmatic hernia. *J Surg Case Rep* 2020; **2020**(6): rjaa101. doi: 10.1093/jscr/rjaa101.

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