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Traumatic Diaphragmatic Hernia Presenting with Gut Gangrene in Acute Phase: A Case Report

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Authors' contributions

This work was carried out in collaboration between both authors. Author TA designed the study, collected the data for the case, and wrote the first draft of the manuscript. Author JM edited the manuscript and was the chief surgeon in the case reported. Both authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Aims: To describe the diagnosis, evaluation and management of a case of acute traumatic diaphragmatic hernia (TDH) with gut gangrene.
Presentation of the Case: A 36-year-old male presented with a history of road traffic accident and complaints of right hip dislocation, fractured femur and breathlessness. X-rays showed a massive left pleural effusion. CT abdomen was done and showed left TDH. Intercostal drainage tube was inserted and showed feco-bilious contents. Bowel perforation was suspected and patient taken up for emergency laparotomy. Intra-operatively, stomach and small bowel were seen herniating into the left thoracic cavity. A gangrenous patch was noted on the anterior wall of stomach with perforation, which was excised and repaired. A mesenteric tear was noted along with gangrene of terminal ileum. The gangrenous segment was resected and end-to-end anastomosis done. Thorough lavage was given and a diversion ileostomy made. The patient had a difficult postoperative period with severe sepsis, but recovered well and discharged on day 15.

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Discussion: TDH is usually diagnosed late in patients of traumatic diaphragmatic rupture and can be life threatening. TDH in acute cases generally have subclinical evisceration which is frequently missed. We present an unusual case of acute TDH with gut gangrene which was managed by emergency surgery. Prompt intervention, insertion of ICD tube and a broad spectrum antibiotic cover helped manage the case and prevent mortality.
Conclusion: A high degree of clinical suspicion is of prime importance in polytrauma cases to rule out traumatic diaphragmatic rupture with hernia. Early diagnosis and aggressive treatment can prevent mortality and improve outcomes.

Keywords: Traumatic diaphragmatic hernia; road traffic accident; strangulation; gut gangrene; emergency surgery; case report.

1. INTRODUCTION

Traumatic diaphragmatic hernia (TDH) following a traumatic diaphragmatic rupture (TDR), is a rare, life threatening complication occurring as a result of abdominal trauma. [1–6]. The incidence varies from 0.4 to 8% and the mortality rate varies between 16.6 and 33.3% [2,7–10]. TDH is more commonly reported in cases of blunt trauma than in penetrating trauma [11]. TDRs' occur more frequently on the left side (88-95%) due to weakness of the left hemi-diaphragm at the lines of embryonic fusion and protection of the right diaphragm by the liver [11,12,13,14].

The TDR process can be divided into three distinct phases, namely, acute, latent and obstructive [10]. The latent and obstructive phases are described together as "delayed presentation." The acute phase is the time when the diaphragm gets injured; during this phase, symptoms of a TDR may be absent or may be masked by co-existing injuries. TDH in the acute phase of TDR is, therefore, often missed and detected much later, frequently secondary to complications of obstruction or strangulation leading to gut gangrene [15].

Once diagnosed, a surgical exploration is often necessary to reduce the contents and repair the diaphragm to avoid both gastro-intestinal and cardio-respiratory complications [16].

We present an unusual case where a patient of a road traffic accident presented with left pleural effusion, and was diagnosed to have TDR with TDH in the acute phase itself, which was associated with gut gangrene.

This case report has been reported in line with the SCARE Criteria [17].

2. PRESENTATION OF CASE

A 36 year old male, shopkeeper by occupation, was referred to our trauma emergency with the history of a road traffic accident on 15 June, 2022. The patient was diagnosed to have a right hip dislocation and fracture of the shaft of right femur. He developed breathing difficulty and was referred with suspicion of fat embolism. On presentation, the patient was well-built, conscious and alert. He complained of severe right hip and thigh pain. Initial survey showed a pulse rate 112/minute, BP of 114/70mmHg and tachypnea. The patient was a smoker since 8 years, and had no significant past medical or surgical history. X-rays confirmed the above injuries, and a chest X-ray showed a massive left pleural effusion, along with fracture of the left 9th rib. The surgeon-on-call was consulted, and an abdominal examination showed a soft abdomen without guarding or rigidity. However, the patient complained of heaviness in the chest while the examination was being performed. Suspecting an undiagnosed abdominal trauma, abdominal and thoracic CT scans were ordered along with routine blood work-up. The scans showed dilated bowel loops in the left thoracic cavity, herniating through a rent in the left hemi-diaphragm, along with a massive left pleural effusion.

An emergency left intercostal drainage tube insertion was performed, which showed a feco-bilious output. A diagnosis of perforation of the herniated bowel loops was made and the patient was taken up for emergency laparotomy.

After taking written informed consent, the abdomen was prepared and patient was shifted to the operating theatre. A midline laparotomy incision was made and the abdominal cavity was entered, showing approximately 500ml bilious contamination. Stomach and small bowel was seen herniating into the left thoracic cavity through a tear in the posterolateral aspect of the left hemi-diaphragm. The herniated contents were reduced. A 1 X 1cm gangrenous patch was noted on the anterior wall of stomach, with perforation. The patch was excised and a Modified Graham Patch repair of the stomach

was done. On further exploration, a large mesenteric tear, along with ileal gangrene, was noted along a 30cm segment starting 20cm proximal to the IC junction, along with multiple perforations. The gangrenous segment was resected and end-to-end anastomosis of the remaining ileum was done. A thorough lavage of peritoneal and thoracic cavity was done using three liters of warm normal saline solution. Proximal to the site of anastomosis, the ileum was exteriorized as a loop ileostomy in the right iliac fossa region, because the presence of intra-abdominal contamination posed a risk for postoperative leak. After confirming the position of the intercostal drainage tube, the diaphragmatic tear was repaired using interlocking, continuous sutures with thick polypropylene suture. A pelvic drain was placed and the abdomen was closed in layers.

While under general anesthesia, the right hip dislocation was reduced and a below knee traction was applied.

The patient was extubated and shifted to surgical ICU. The patient was initially managed on IV meropenem, amikacin and metronidazole. The ileostomy became functional on day 3. The patient was started on nasogastric tube feeds. A medical consult was taken in view of resistant hypertension, and advised tablet losartan and IV furosemide. He started developing severe sepsis, and worsening of total leukocyte counts, reaching 32,000/cu mm on day 7. He was switched to a regime of IV tigecycline and polymixin B on day 8 and responded well. Once the infection improved, the nasogastric tube was removed and patient was started on oral liquids on day 11. On day 14, the patient was initiated on a soft solid diet, which he tolerated well. The drains were eventually removed and patient was discharged on post-operative day 15.

The patient remained on regular follow-ups. An enterostomy reversal was successfully done 4 months after the initial surgery and the patient continues to do well till present.

3. DISCUSSION

Traumatic diaphragmatic hernia is the displacement of intra-abdominal organs into the thoracic cavity through a rent in the diaphragm as a result of trauma. Because traumatic diaphragmatic hernia does not always have hernial sac, it is sometimes referred to as a “false hernia.” However, the presence or absence of a hernia sac has only a little impact on the clinical course and management, and the term “traumatic diaphragmatic hernia” is generally accepted in the medical literature [18].

TDH is usually diagnosed incidentally, and often late, in patients having a history of abdominal trauma, presenting months to years later, with cardio-respiratory complaints or features suggestive of obstruction or strangulation. However, diagnosis of TDH during the acute phase of TDR is a rare clinical entity.

Early diagnosis of TDH remains a challenge and may be missed during the initial survey of a polytrauma patient. A high degree of clinical suspicion is necessary to order appropriate investigations for confirming the diagnosis. In our case, a subtle complaint of heaviness in chest during abdominal palpation prompted the surgeon to obtain CT scans of the abdomen and chest, and eventually diagnose a TDH.

TDH in acute phase generally presents with only evisceration or, rarely, a perforation of the bowel but strangulation or gut gangrene is extremely uncommon. In our patient, the ICD inserted for pleural effusion drained bowel contents and a diagnosis of bowel perforation was made, which was successfully treated with an emergency laparotomy. Stomach is the most commonly herniated viscera in cases of TDR [11], but a combined evisceration is usually rare, as reported in a study by Al Refaie RE et al. to be appearing in only 4.3% cases [11]. Intraoperatively, we found stomach and ileum to be herniating and gangrenous (secondary to strangulation of stomach as well as a large mesenteric tear along the distal ileum), which is a very rare finding. To our knowledge, this is the first case in the literature of a TDH in acute phase, presenting with gut gangrene.

Similar to how multiple injuries in a polytrauma patient can distract from the diagnosis of a TDH, management of TDH should proceed with careful management of other injuries as well. In our patient, the reduction of right hip dislocation and below knee traction for fractured femur, were both done in the OT while the patient was still under the cover of general anesthesia.

Prompt surgical intervention, with insertion of ICD tube to allow drainage and proper chest expansion and a broad antibiotic cover helped us in managing a difficult polytrauma case with an unusual presentation and systemic infection. A

high degree of clinical suspicion and effective investigations are of prime importance in polytrauma cases to rule out a traumatic diaphragmatic rupture with hernia and our case report aims to highlight the importance of early diagnosis and aggressive treatment in preventing morbidity and death.

4. CONCLUSION

Diagnosis of traumatic diaphragmatic hernia is a case of polytrauma remains a challenging problem. Strong clinical suspicion, detailed physical examination, and aggressive investigation can help in an early diagnosis which can be promptly managed with emergency surgical intervention with good results.

CONSENT

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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