Case study

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

ABSTRACT

Aims: To describe the diagnosis, evaluation and management of a case of acute traumatic diaphragmatic hernia (TDH) with gut gangrene.

Presentation of case: A 36 year old male presented with history of road traffic accident with complaints of right hip disclocation, 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.

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 traumatic diaphragmatic rupture (TDR) is an uncommon but life threatening condition that is seen in cases of abdominal trauma. [1–6]. The reported 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 penetrating trauma. [11] Most diaphragmatic ruptures occur on the left side (88-95%) due to weakness of the left diaphragm at the lines of embryonic fusion and protection of right diaphragm by the liver. [11, 13, 14, 17]

The diaphragmatic rupture process can be divided into three phases, acute, latent and obstructive [10], where the latter two are described as “delayed presentation.” The acute phase is the time when the diaphragm is injured; during this phase, symptoms of a TDR may be absent or masked by co-existing injuries. TDH in acute phase of TDR is therefore often missed and usually detected late, frequently secondary to complications of obstruction or strangulation leading to gut gangrene.

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. [15]

We present an unusual case where a case of 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. [16]

2. PRESENTATION OF CASE

A 36 year old male, shopkeeper by occupation, was referred to our trauma centre with the history of road traffic accident on 15 June, 2022. The patient was diagnosed with right hip dislocation and fracture shaft of right femur. He developed breathing difficulty and hence, was referred to SMS hospital. On presentation, the patient was well built, conscious and alert. He complained of severe right hip and thigh pain. He had a pulse rate 112/minute, BP of 114/70mmHg and was tachypneic. The patient was a smoker since 8 years, and had no significant past medical or surgical history. A routine survey was performed and X-rays confirmed the above injuries. He complained of difficulty in breathing so a chest X-ray was performed and massive left pleural effusion was noted along with fracture of left 9^{th} rib. A general surgeon on call was asked to review where 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 some undiagnosed abdominal trauma, abdominal and chest CT scans were ordered along with routine blood workup. The CT scan showed herniation of bowel through a rent in the left hemidiaphragm along with a massive left pleural effusion.
In view of worsening tachypnea, an emergency left intercostal drainage tube insertion was done. Upon insertion of the tube, feco-bilious contents started to drain. The diagnosis of bowel perforation of the herniated segment was made and patient was taken up for emergency laparotomy.
IV fluids were started and after taking written informed consent, the abdomen was prepared and patient shifted to the operating theatre. Parts were painted and draped and a midline laparotomy incision given. The abdominal cavity showed around 500ml of contamination with bilious content. Stomach and small bowel was seen herniating into the left thoracic cavity through a tear in left hemi diaphragm. The herniated contents were reduced and a 1 X 1cm gangrenous patch was noted on the anterior wall of stomach with perforation. The gangrenous patch was excised and a Modified Graham Patch repair of the stomach was done. On further exploration, a large mesenteric tear was noted along a 30cm segment of small bowel, about 20cm proximal to the IC junction, along with gangrene and multiple perforations in the associated small intestine. 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. 20cm proximal to the site of anastomosis, the ileum was exteriorized as a loop ileostomy in the right iliac fossa region, due to the presence of intra-abdominal contamination posing a risk for leak. After confirmation of the position of the intercostal tube, the diaphragmatic rupture was repaired using interlocking continuous sutures with Prolene 1 suture. After confirmation of hemostasis, a pelvic drain was placed and the abdomen 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 Inj. Meropenem, amikacin and metronidazole. The ileostomy became functional on day 3 and he was started on Ryle's tube feeds. A medical consult was taken in view of resistant hypertension and was started on tablet losartan and injections of furosemide. He started developing severe sepsis, and worsening of total leukocyte counts, reaching 32,000 on day 7. He was switched to a regime of inj. Tigecycline and polymixin B on day 8 and responded well. Once the infection improved, the enterogastric 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 was tolerated well. The drains were eventually removed and patient was discharged on post-operative day 15.
The patient remained on regular follow-ups and continued to do well. An enterostomy reversal was eventually done 4 months after the initial surgery and the patient tolerated the procedure well and continues to do well till present.

3. DISCUSSION

Traumatic diaphragmatic hernia is 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 of old trauma presenting with cardio-respiratory complaints. 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 case. A high degree of clinical suspicion is necessary to perform necessary investigations to confirm 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 cases generally present with only evisceration and rarely perforation of the bowel but not usually gangrene. An ICD insertion for pleural effusion drained bowel contents and immediately, 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 4.3% [11]. In our case, stomach and ileum both were found 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 presentation in literature. To our knowledge, this is the first case in literature of a TDH in acute phase presenting with gut gangrene.

Similar to how multiple injuries in a trauma patient can distract from the diagnosis of a TDH, management of TDH should proceed with careful management of other injuries as well. In our case, the reduction of right hip dislocation and traction application for fracture 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 (WHERE EVER APPLICABLE)

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

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