



## Blunt traumatic esophageal injury: Unusual presentation and approach<sup>☆</sup>



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### ABSTRACT

**INTRODUCTION:** Blunt esophageal injury is extremely rare event. However, it is a potential morbid injury unless managed early.

**PRESENTATION OF CASE:** We report a rare case of blunt esophageal injury for a 28-year old male who presented with history of fall of heavy object over the right side of the chest. Diagnostic work up including chest X-ray, computerized tomography scans and gastrografin esophagogram revealed lower esophageal rupture. Right mini-thoracotomy with esophageal repair was performed. Postoperative course was uneventful.

**DISCUSSION:** The exact mechanism of blunt esophageal injury remains uncertain. This report described a unique location of esophageal rupture after blunt trauma that happened on the right side. Diagnosis of esophageal injury needs high index of suspicion and accurate diagnostic workup.

**CONCLUSION:** Prompt diagnosis and management are the key for better prognosis in patients with blunt esophageal injury.

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## 1. Introduction

Esophageal injury following blunt chest trauma is extremely rare (up to 0.1%).<sup>1</sup> Up to the best of our knowledge, the first case of tracheoesophageal fistula in a patient who sustained blunt thoracic trauma was reported by Vinson.<sup>1</sup> Delayed treatment of esophageal injury is associated with increased morbidity such as mediastinitis.<sup>2</sup> Among all esophageal perforations, the reported incidence of traumatic esophageal rupture varies from 4% to 14%.<sup>3,4</sup> Esophageal rupture is usually reported by penetrating or iatrogenic injury caused during diagnostic or therapeutic interventions.<sup>5</sup>

In 1988, Beal et al. conducted a meta-analysis of esophageal perforation cases due to external blunt trauma and reported only 96 cases of which 5 cases were located distally.<sup>6</sup> Traumatic lower esophageal injuries are rarely reported.<sup>7–14</sup> Herein, we report a rare

case of blunt lower esophageal injury presented with right hemothorax after fall of heavy object over the patient chest.

## 2. Case presentation

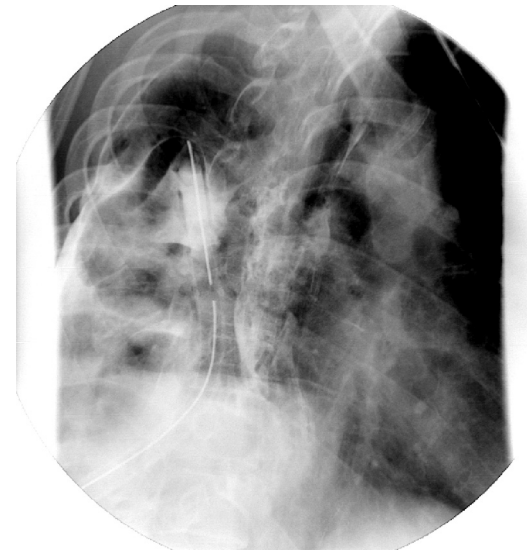
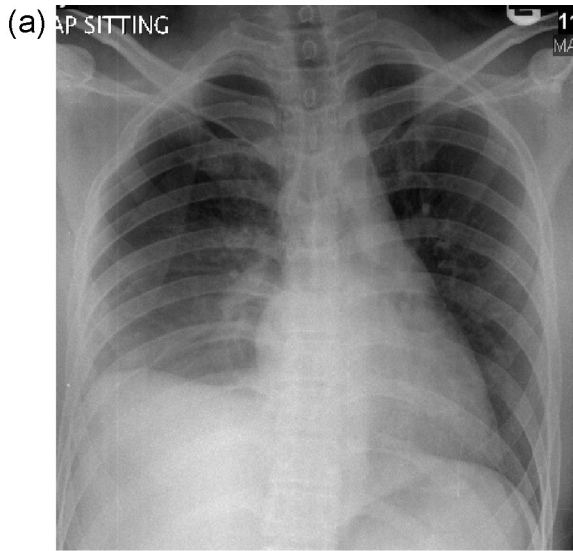
A 28-year old male patient presented at our trauma unit with history of fall of heavy object over the right side of chest and abdomen. The main complaint was severe central chest pain. Clinical assessment showed that the patient was hemodynamically stable, fully conscious, and normothermic. Chest wall was tender with mild skin contusion just to the right of sternum and mid chest. Abdominal examination revealed mild epigastric tenderness and voluntary guarding. Focused Assessment with Sonography in Trauma (FAST) was negative and the rest of the examination was normal. Chest-X ray showed hemothorax at the right side (Fig. 1a). A 36F Chest tube was inserted on the right side which drained 400cc dark stained fluid with food particles (Fig. 1b). Computed tomography (CT) scan confirmed the presence of right hemothorax, collapse of right lower lobe of lung, and normal mediastinum, diaphragm, and abdomen (Fig. 2).

A gastrografin esophagogram revealed large free esophageal perforation at right side with passage of contrast to the right pleura (Fig. 3).

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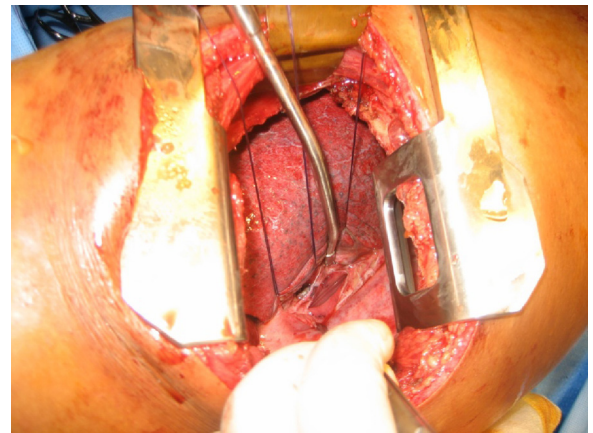
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**Fig. 3.** Gastrografin esophagogram with leakage of contrast to right pleura denoting free esophageal injury. Notice the chest tube and residual hemopneumothorax.

**Fig. 1.** (a) Portable chest X-ray with right sided hemopneumothorax. (b) Right chest tube drained dark stained fluid with food particles (sediment).



**Fig. 4.** Longitudinal lower esophageal injury (4 cm) with relatively healthy edges.

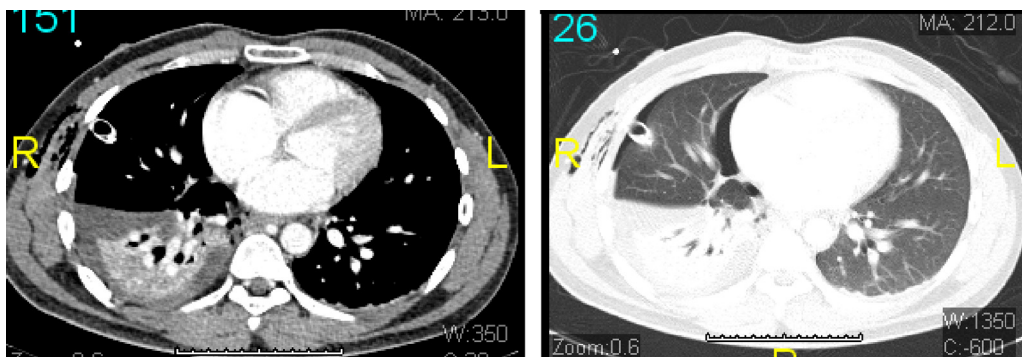
Immediate posterolateral thoracotomy was performed through the right 5th intercostal space which revealed a 4 cm longitudinal tear of lower esophagus 2 cm above the right hemidiaphragm with no active bleeding (Fig. 4).

A two layered-repair was performed, first continuous inverting PDS 4 0 followed by interrupted everting Lembert sutures. The repair was checked for air leak under water (with nasogastric tube bulled under vision to just above the repair position with air insufflation while lower esophagus was compressed). Postoperative course was uneventful. A follow-up gastrografin study on 7th

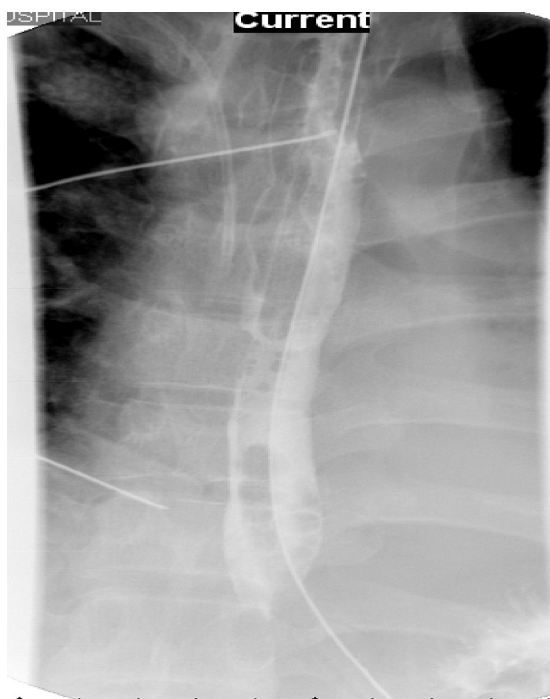
postoperative day revealed free passage of contrast without leak (Fig. 5). The patient was sent home in good general condition and was followed at the trauma outpatient clinic regularly.

### 3. Discussion

The present case report describes a unique location of the esophageal rupture after blunt trauma that happened on the right side of the chest.



**Fig. 2.** Computerized tomography of the chest with right hemopneumothorax, chest tube in place and lung collapse.



**Fig. 5.** Postoperative gastrografin demonstrating smooth flow of contrast with no evidence of leak.

The exact mechanism of blunt esophageal injury remains uncertain. However, it has been speculated that instant dilatation of the esophagus could be possible due to pressurized air which pushes the cricopharyngeal sphincter. This high pressure might lead to esophageal rupture, if the esophagogastric sphincter remains closed.<sup>15</sup> Many factors contribute to the rarity of esophageal injury including the protective location of the esophagus deep in the posterior mediastinum, easy mobility (lack of tethering), the rigid hard shell of human chest.<sup>16</sup> Blunt esophageal injuries are caused by an unusual increase in pressure of the esophageal lumen due to a strong blow to the epigastrium. Distal esophageal rupture with spillage of upper gastrointestinal contents into the chest is most frequently encountered on the left side. Though, esophageal rupture is rare, it causes severe morbidity and mortality up to 20%.<sup>3,17</sup> Treating esophageal injuries is further complicated by certain crucial considerations which include timing, extent of injury, containment and location. Moreover, esophagus is anatomically divided into 3 parts, i.e. cervical (upper), mediastinal (middle) and thoraco-abdominal (lower) and it does not have mesentery and serosal coating unlike most of the digestive tract, which makes it more complex. The distal esophagus could be approached via left posterolateral thoracotomy. The level of the perforation of the thoracic esophagus determines the surgical approach; a mid-esophageal perforation is approached through a right while a distal esophageal perforation is approached through a left thoracotomy.<sup>18</sup> The gastrografin esophagogram was helpful in our case as it helped to identify the location of the injury and guided the surgical approach to the lower esophagus through the right side.

#### 4. Conclusion

Diagnosis of esophageal injury needs high index of suspicion and accurate diagnostic workup. Prompt diagnosis and careful

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planning for surgical repair of esophageal injury should be the best approach to manage this potentially morbid injury. Further, our case report addresses the need for organized approach to lower thoracic esophageal perforations with mini-thoracotomy on the side of associated pleural collection for the management of blunt esophageal rupture. The authors have no conflict of interest and no financial issues to disclose.

#### Conflict of interest

None.

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#### Ethical approval

The case report has been approved by the Medical Research Center (IRB #13296/13), Hamad Medical Corporation, Doha, Qatar.

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