**Scholars Journal of Medical Case Reports** **ISSN 2347-6559 (Online)**
Sch J Med Case Rep 2014; 2(6):362-364 **ISSN 2347-9507 (Print)**

(An International Publisher for Academic and Scientific Resources) DOI: 10.36347/sjmcr.2014.v02i06.003

# Penetrating Trauma in Lower Chest Causing Gastric Fundal Perforation: A Rare Presentation

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**Abstract:** A 20 years old male presented to casualty with alleged history of penetrating injury to left lower chest with a metal rod. Vitals were stable on presentation. Radiological investigations were normal on presentation. During observation patient developed signs of peritonitis and respiratory distress after 36 hours. Patient underwent laparotomy and was found to have gastric fundal perforation. Penetrating lower thoracic injuries are associated with high risk of injury to diaphragm and upper enteric organs. Such injuries may have minimal clinical or radiologic signs early in the course of presentation leading to delayed presentation. So a high degree of suspicion is required to diagnose these conditions early to decrease morbidity and mortality.
**Keywords:** thoracoabdominal trauma; gastric fundal perforation; diaphragmatic perforation; rare presentation

## INTRODUCTION

Thoraco- abdominal injuries are defined as those penetrations that are located above the costal margin but below the fifth intercostal space. The danger to the enteric structures lies with the potential that the stabbing instrument could have traversed lung tissue, and the diaphragm and penetrated stomach or small bowel. The diagnostic challenge of multiple body cavity injuries, the notorious difficulty of establishing the proper sequence for intervention, the injury severity and frequent hemodynamic instability and the inherent danger of cross-cavity contamination conspire to increase morbidity and mortality for these injuries.

## CASE REPORT

A 20 year old male patient presented to casualty with alleged history of accidental stab wound by a metal rod in left lower chest due to self fall. History suggested only 1 inch penetration by the rod. Patient complained of pain in left lower chest at the site of stab wound and had no complaints of breathing difficulty or abdominal pain. On presentation vitals were stable. Systemic examination was normal. Penetrating wound present over left 7th intercostal space, Depth of penetration was appreciable upto 2cms. There was no surgical emphysema. Chest X-ray, X-ray Erect abdomen and Ultrasound of the abdomen were normal. Patient was admitted for observation. As patient was asymptomatic for more than 24 hours patient was started on oral sips. After 36 hours of admission patient complained of increase in the severity of pain in left lower chest and upper abdomen. Repeat erect X-ray of the abdomen showed gas under diaphragm and gradually patient developed signs of peritonitis and respiratory distress (Fig 1). Patient was posted for emergency laparotomy and was found to have perforation of diaphragm between the cardiac apex and upper pole of the spleen ,along with gastric fundal perforation (Fig 2) measuring 0.5x0.5cms, 500ml of bile stained fluid was present in peritoneal cavity. No other abdominal organs were injured. Perforation site was closed using Graham's patch and abdominal and intercostals drains were put. ICD drained 200ml of blood stained fluid. Drains were removed on post-operative day 6. Post-operative period was uneventful.

**Fig-1: Chest Xray and Xray Erect abdomen on presentation and after 36 hours showing gas under diaphragm and left hemothorax.**

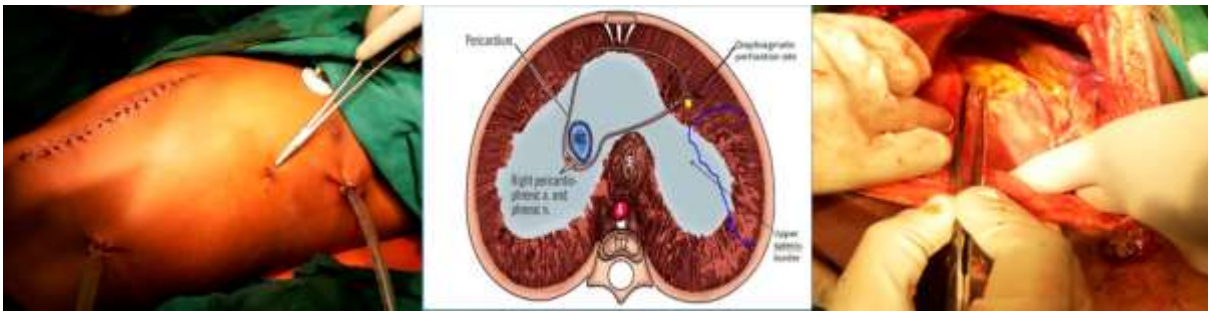

**Fig-2: Image showing site of penetration, diaphragmatic perforation and gastric fundal perforation.**

**DISCUSSION**

The thoracoabdominal region is that area of the body that contains portions of both the abdominal and thoracic cavities. The upper limits of the abdomen are bounded by the diaphragm, which in full expiration elevates to the level of the nipples anteriorly and the tips of the scapula posteriorly. These correspond to the level of the fourth and sixth ribs, respectively. In a study by Moore et al the frequency of abdominal organs involved in penetrating thoracoabdominal trauma by a stab wound was liver(3% cases), diaphragm (12%), spleen (5%), stomach (1%), colon (3%), small bowel (2%)[1]. Injuries to stomach almost always consist of single or pair of perforations. The site most commonly affected is the anterior wall (40%), followed by greater curvature(23%), lesser curvature(15%) and posterior wall (15%)[2,3,4].

Physical examination of the chest is often unreliable in diagnosing or excluding thoracic injuries, a chest radiograph should be obtained. Physical examination and hemodynamic monitoring are accurate tools for assessing the need for abdominal exploration. Indications for operation include abdominal tenderness away from the sight of injury, hypotension, or ongoing hemorrhage. Those patients not requiring immediate laparotomy, require close observation.

Delayed manifestations of intra-abdominal injuries may take up to 24 hours to present. In the above case signs of peritonitis developed after 36 hours. Any free fluid in the abdomen on CT scan after a penetrating chest injury mandates abdominal exploration. Alternate diagnostic approach could be use of peritoneal lavage and diagnostic laparoscopy.

Management of penetrating thoraco-abdominal trauma depends on the hemodynamic stability of the patient. More than 85% of penetrating chest injuries can be managed by tube thoracostomy and observation alone[5]. Small lacerations to the diaphragm may not be lethal in the acute setting, larger defects in the diaphragm need primary surgical repair to prevent the development of delayed diaphragmatic hernias[6,7].

Stomach should be adequately examined during laparotomy. Perforation site can be closed using a single or double layered suture.

## CONCLUSION

Penetrating lower thoracic injuries are associated with high risk of injury to diaphragm and upper enteric organs. Such injuries may have minimal clinical or radiologic signs early in the course of presentation leading to delayed presentation. So a high degree of suspicion is required to diagnose these conditions early to decrease morbidity and mortality.

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