



Blunt Trauma-Induced Diaphragmatic Hernia: Surgical Strategy and Outcomes

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Abstract: Blunt trauma-induced diaphragmatic hernia (DIH) is a rare but potentially life-threatening condition. Prompt diagnosis and management are crucial for successful outcomes. We present the case of a 40-year-old male who sustained blunt abdominal and chest trauma resulting in a left DIH with extensive gastrointestinal involvement. The patient underwent emergency laparotomy with primary repair of the diaphragmatic defect and resection of gangrenous stomach and bowel segments. Postoperatively, the patient recovered well and was discharged on day 14. Diagnosis of DIH relies on high clinical suspicion and radiological imaging, with CT scan being the modality of choice. Management involves surgical repair, either by primary closure or with the use of mesh, depending on the extent of the injury and presence of infection. Mortality rates are high in emergency repairs, especially when associated with bowel necrosis and perforation. This case highlights the importance of early recognition and timely intervention in DIH. Clinicians should maintain a high index of suspicion for DIH in patients presenting with a history of trauma and respiratory or abdominal symptoms. Improving awareness and understanding of abdominal injuries in trauma centers can help in early diagnosis and appropriate management, ultimately leading to better outcomes for patients with DIH.

Keywords: Traumatic diaphragmatic hernia, Laparotomy, Thoracotomy, Abdominal trauma, Gangrenous tissue, Diaphragmatic tear, Primary repair, Intensive care unit.

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INTRODUCTION

Traumatic diaphragmatic hernia often occurs due to blunt or penetrating injury, can be managed through laparotomy or thoracotomy. CT scan is the good modality of investigation of choice for diagnosis of diaphragmatic hernia. Chest X-ray may also help in arriving at the diagnosis. These radiological modalities helps in early diagnosis and ultimately managing the patient with diaphragmatic hernia better.

CASE REPORT

A 40 years male from PIMS, UMARDA, RAJASTHAN; presented to Trauma centre with complaints of chest & abdominal pain associated with nausea & vomiting, he had history of blunt abdominal and chest trauma 12 hours before presentation, on examination pulse 128/min, blood pressure 112/74 mm hg, he had general abdominal tenderness in all quadrants, and lung auscultation revealed decreased respiration and gurgling sound on the left.

Chest X ray showed left hemidiaphragm continuity was disrupted and air fluid level was

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present in left hemithorax and thoracoabdominal CT scan was performed which revealed rent at the slip of left hemidiaphragm with herniation of stomach through the rent into left hemithorax causing passive compression on left lung parenchyma.

The decision to perform an emergency laparotomy was made and patient was shifted for emergency OT after informed consent.

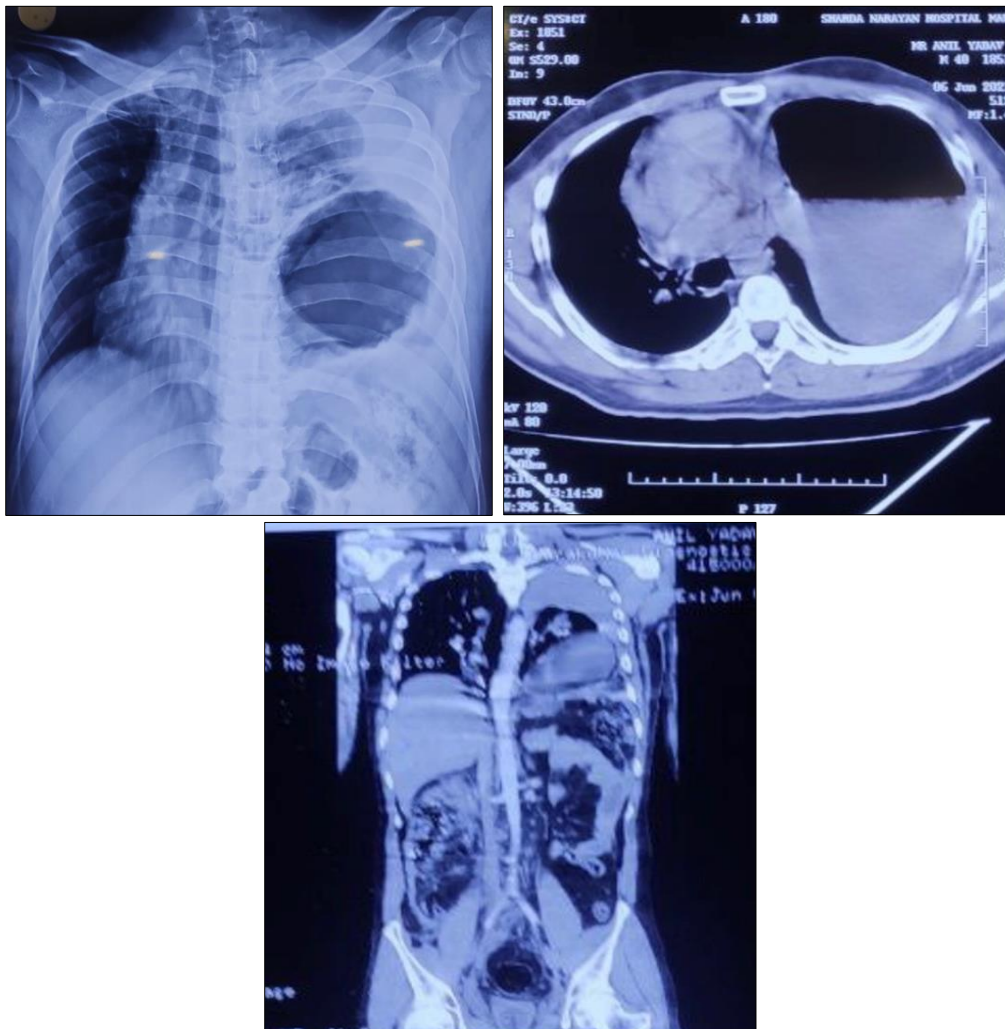
On exploration approx 300 ml sanguinous fluid and clots was present and herniation of major part of stomach and omentum was present as content and approximate 7-8 cm left diaphragmatic tear was present, fundus and part of body of stomach along with greater curvature and caecum, ascending colon up to hepatic flexure was gangrenous, there was around 15 cm ileal mesenteric tear up to root of mesentery (bucket handle) 2 feet proximal to ICR was present.

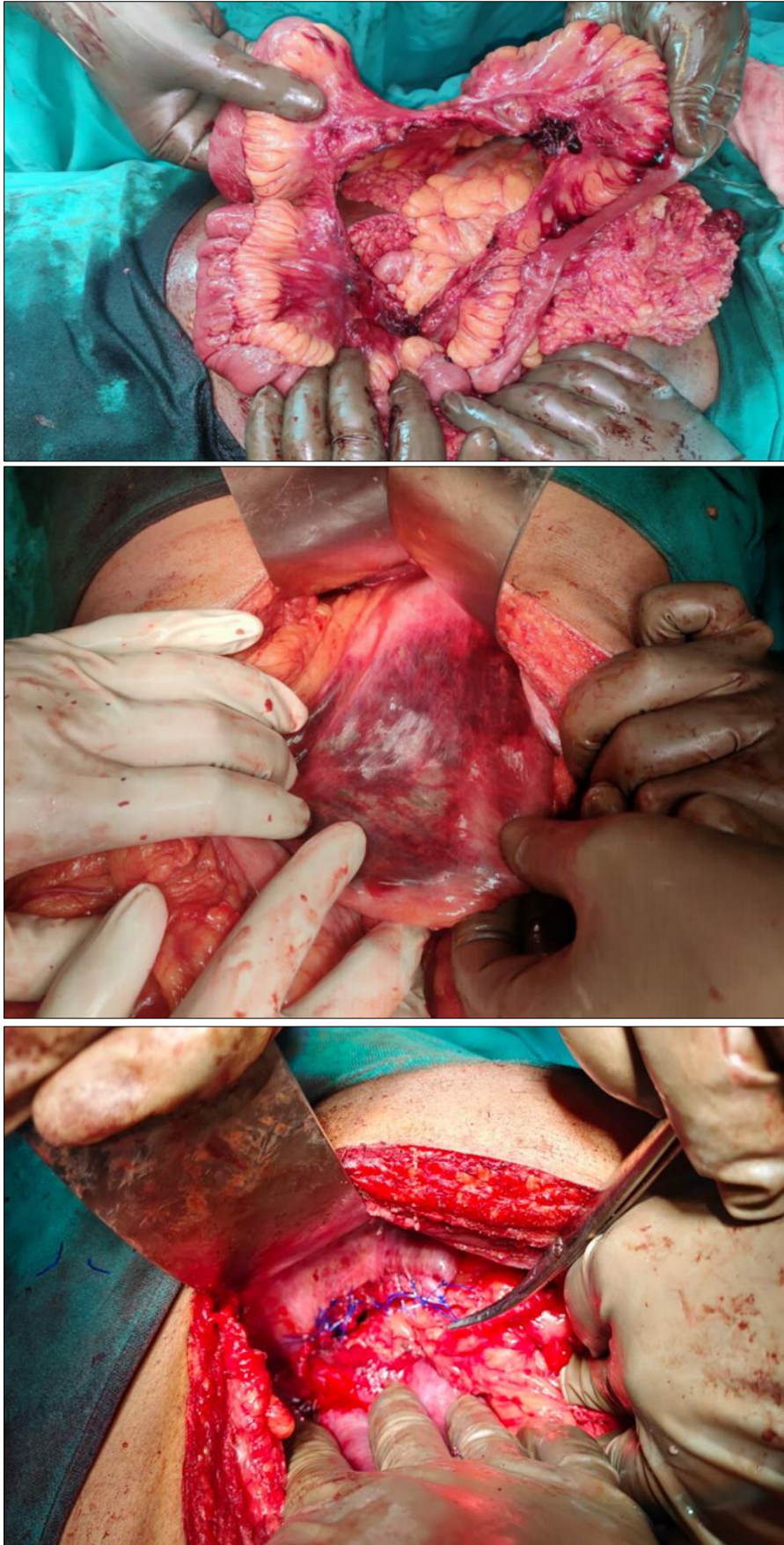
Gangrenous part of stomach was excised and primary repair in two layer using absorbable suture was performed, and the diaphragmatic defect was sutured in intermittent manner with non-absorbable

suture and thoracostomy tube was placed, Right hemicolectomy along with bucket handle segment was excised and end ileostomy was performed with Feeding jejunostomy using 18 Fr ryle's tube, 16 Fr suction drain in lesser sac and 32 Fr drain was placed in pelvic cavity and abdomen was closed, and patient was shifted to Intensive care unit for close follow-up.

On the third post-operative day x ray chest showed both lungs are clear and expanded with minimal left costophrenic angle blunting with normal cardio-mediastinal silhouette.

Patient was followed with effective lung care in addition to medical therapy, on post-operative day 6 pelvic and lesser sac drain output was minimal and taken out and patient started feeding jejunostomy, on post-operative day 10 RT was taken out and oral intake was allowed and increased gradually on post-operative day 12 chest X ray shows clear costophrenic angle and thoracostomy tube was taken out Post-operative course was uneventful and patient was discharged on day 14 with satisfactory condition.





DISCUSSION

Diaphragmatic hernia may be congenital or acquired due to trauma. The majority of traumatic diaphragmatic injury caused by either penetrating trauma or blunt abdominal trauma while major of cases due to blunt abdominal trauma (80%), but it largely depends on geographic and socio-economic factors [1].

Males usually outnumber females because of different social activities, only around 13% of hernias are found on right side [2].

If rent of the diaphragm is large enough herniation of content is easily detected but sometimes a small rent in diaphragm may be asymptomatic which can grow overtime leads to herniation of organs. Patient may present with wide variety of symptoms due to visceral herniation with or respiratory problem such as chest pain, dyspnoea and tachypnea.

CT scan has now been regarded as the diagnostic radiological tool of choice [2].

CT scan with high space definition and multiplanner reconstruction to help diagnosis and achieved a minimal number of missed diaphragmatic injury. CT has greatly enhance the possibility of early diagnosis and reported to have a sensitivity of 71% and specifically of 100% [3].

Laparotomy may be used in patient presenting with abdominal symptoms for physical sign but patient with severe injury in the junction between thorax and abdomen, thoracoabdominal incision may be approach.

Diaphragmatic hernia can be repaired either with the placement of the mesh if that surgical area is

not infected or primary repair of the diaphragmatic defect using non-absorbable sutures in continuous or intermittent in manner [4].

Mortality rate in elective repair is low but in case of emergency repair upto 80%, specially in cases accompanied by necrosis and perforation [5].

CONCLUSION

Clinician should be aware of intestinal necrosis and should evaluate all the gastrointestinal structures during repair of diaphragmatic lacerations. Understanding and awareness of abdominal injuries should be improved in trauma centre to avoid delay in diagnosis.

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