



GIANT POSTTRAUMATIC DIAPHRAGMATIC HERNIA REPAIR AND MANAGEMENT : A REVIEW OF LITERATURE

General Surgery

Dr Deepak Kumar Jha*

Senior Resident, Deptt. Of General Surgery, Aiiims, Patna. *Corresponding Author

Dr Shiv Kishore

Senior Resident, Deptt. Of Trauma And Emergency, Aiiims, Patna.

Dr Hariprasad C P

Postgraduate Trainee, Deptt. Of General Surgery, Aiiims, Patna.

ABSTRACT

A traumatic diaphragmatic hernia is caused as a result from blunt or penetrating trauma and occurs in about 1-5% of cases of severe blunt trauma to the trunk. Early diagnosis of traumatic diaphragmatic hernia is necessary to decrease morbidity and mortality associated with it. This case report describes the case of 23-year-old male who had an accidental fall of a slab of marble on him and had a diagnosis of traumatic diaphragmatic hernia with multiple long bone fracture. On physical examination, upper abdomen was tender and breath sounds over left half of chest were muffled and were mixed with peristaltic sounds. Thoracoabdominal X-rays and computerized tomographic imaging have demonstrated multiple gas shadows in the left side of thorax with collapse of the left lung. Laparotomy and exploration revealed a left diaphragmatic tear of size 15 cm near its anterior point of attachment with rib cage with herniation of stomach, transverse colon, and omentum in to thoracic cavity.

KEYWORDS

Diaphragm, Hernia, Trauma

INTRODUCTION

Traumatic diaphragmatic rupture can result from penetrating trauma or more rarely from blunt trauma¹. It is an uncommon diagnosis in trauma patients in the emergency department. An accurate diagnosis is important because untreated diaphragmatic defects can lead to subsequent complications²⁻³. The most serious complication of a diaphragmatic hernia is strangulation, and the occurrence of symptoms of intestinal obstruction or pulmonary compression in a patient with a recent or old wound of the chest or upper abdomen should arouse suspicion. In this report, we present a case of post traumatic diaphragmatic rupture with associated herniation of abdominal contents resulting from blunt trauma.

Computed Tomography (CT) chest and abdomen should always be obtained in all cases of thoraco -abdominal injuries as it is useful in ruling out rupture diaphragm in asymptomatic cases plus it has additional benefit in visualizing solid organs and hollow viscus especially in patients with multiple injuries.

Treatment of rupture diaphragm mainly consists of repair of diaphragm, can be performed through a thoracotomy or laparotomy. Laparotomy has additional benefits of directly inspecting all intra-abdominal organs during surgery.⁴

CASE REPORT

This 23 year old male presented to our emergency room with h/o fall of heavy slab of marble about 2 days back. He was admitted in a private nursing home for two days where chest drain was inserted on left side and the patient was sent to our emergency. On presentation he c/o pain in left side of chest and upper abdomen. He also c/o difficulty in breathing. On clinical examination the vitals were stable, there was decreased breath sound noted in left side of chest and apical beat was also noted in the center of chest. Peristaltic sounds were audible in left side of chest and patient complained of mild breathing difficulty. He also had associated fracture of left forearm both bone and fracture right shaft of femur.

After initial resuscitation patient was sent for CECT chest in which diaphragmatic injury on left side was confirmed and decision for exploratory laparotomy was made.



Fig 1 preop X Ray

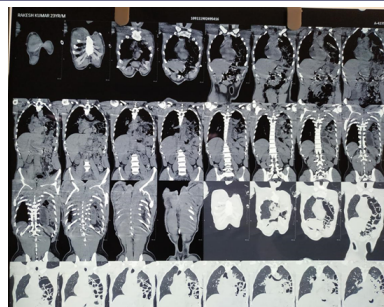


Fig 2 cect chest

Midline exploratory laparotomy incision was planned. Stomach, transverse colon, omentum was reduced to abdominal cavity and diaphragmatic injury was evaluated. About 15 cm diaphragm was found teared near its left anterior chest wall insertion. Repair of defect was done using continuous no. 1 barbed nonabsorbable suture. No associated intraabdominal injuries were noted and abdomen was closed after placing drain in pelvis. Repositioning of insitu chest drain was done before repairing of defect.

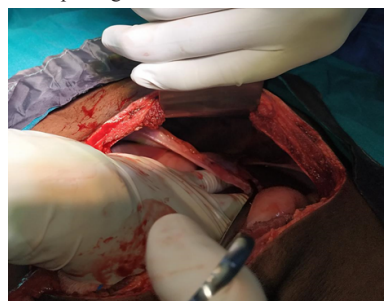


Fig 3 intraop photo showing the diaphragmatic rupture

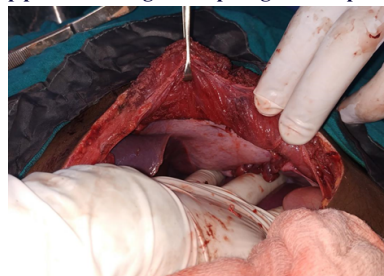


Fig 4 post repair photo

Patient made uneventful recovery in post op period. POD 1 chest X ray showed normal diaphragmatic contour on left side. Liquids were started on POD 3 after appearance of bowel sounds. Orthopaedic intervention were planned after the acute recovery of patient and he was later discharged in full health.

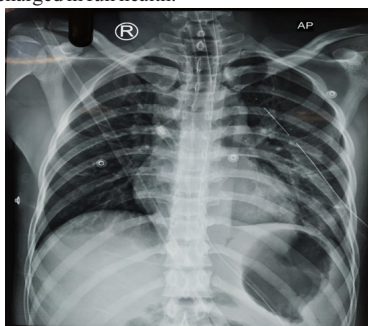


Fig 5 chest x ray following 4 hours of surgery

DISCUSSION

INCIDENCE

Traumatic diaphragmatic rupture though uncommon occurs as a result of blunt or penetrating injury to abdomen. Diaphragmatic rupture mainly occurs after high velocity trauma to abdomen in road traffic accident. The incidence rate ranges between .8 to 5 percent.⁵ Left-sided TDRs are more common than right sided TDRs due to the anatomical position of the liver which protects the right side of the diaphragm. Approximately 33% of diagnosed TDRs are due to a blunt mechanism, while 67% are due to a penetrating mechanism.⁶

AETIOLOGY

Following blunt trauma, the injury of the left hemidiaphragm occur three times more frequently than injury of the right side. Nevertheless, the less common right-sided ruptures has more severe associated injuries and result in greater hemodynamic instability. They require greater force of impact, possibly because the liver provides protection or because of weakness of the left hemidiaphragm.⁷ The estimated ratio of right-sided versus left-sided (16.2% vs 83.8%) TDR according to literature.^{8,9}

CLINICAL FEATURES

Most of the patients suffer from dyspnea and pain in the upper abdomen. Generally, patients present with symptoms related to the associated injuries. Other factors that should arise suspicion for TDR and prompt further diagnostic investigation are the following: fracture ribs, fracture of pelvis or lumbar spine, auscultation of bowel sounds in the chest and dullness on percussion of the chest.¹⁰ Meanwhile, in cases with a small tear and no herniation, specific signs and symptoms may not be present during the acute phase. The commonest symptoms of diaphragmatic injury patients are dyspnea and upper abdominal pain.

INVESTIGATIONS

An X-ray is diagnostic when the nasogastric tube is seen in the chest. According to the literature, initial radiographs allow diagnosis of 27–60% of left-sided injuries and only 17% of right-sided injuries.¹¹ The collar sign is seen when abdominal contents are seen in the thorax with or without focal constriction. Elevation and distortion of the hemidiaphragm are corroborative signs. A CT thorax has a sensitivity of 14–82% and a specificity of 87% and permits direct visualization of the contents and the rupture. Focussed abdominal sonography for trauma is now a good aid in diagnosing diaphragmatic hernia.

MANAGEMENT

When diagnosed, surgery must be performed as soon as possible, as any delay might cause a herniation of any abdominal organ. The pressure difference between the two cavities causes a herniation and this may result in strangulation and perforation of the abdominal organs, which will increase the morbidity and mortality rate. The choice of surgical approach can be thoracotomy, laparotomy or both if necessary. The laparotomy is recommended for early-diagnosed patients who allow exploration of the intra-abdominal organs for any associated injury. Thoracotomy is necessary for late cases to safely separate the adhesions between the abdominal organs and the thoracic wall. Minimally invasive procedures (abdominal and thoracic) are now-a-days preferred in small defects detected early. Laparotomy remains the gold standard in large defects. Repair consists of

approximation of torn edges by simple continuous or interrupted non absorbable sutures. In this particular case use of barbed suture was of great help due to its self locking nature of each bite.

CONCLUSION

From our case we can draw a conclusion that large rupture of diaphragm especially if left sided is comparatively easy to diagnose with high index of suspicion but that may not be true in all diaphragmatic ruptures. Clinical presentation may vary as asymptomatic, acute presentations and delayed presentation. Right sided diaphragmatic ruptures are difficult to be diagnosed clinically and radiologically. A surgeon handling trauma should have high degree of clinical suspicion of rupture diaphragm in all cases of RTA with multiple injuries to arrive at a diagnosis. All cases of thoraco-abdominal injuries should be investigated with CT chest and abdomen. If other measures fail in establishing the diagnosis then lastly a diagnostic laparoscopy or exploratory laparotomy should be undertaken. We particularly found use of barbed suture helpful in this case but for generalized recommendations larger studies need to be done.

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