

DIAPHRAGMATIC HERNIA MASQUERADING AS BRONCHIAL ASTHMA

Dr Ashwin M Hatwalne, Dr Shrivathsa K Merta, Dr Hemanth Kumara GK, Dr Kuldeep Ram,
Dr Varun H U

Post Graduate student, Associate Professor
Mysore Medical College & Research Institute

Abstract

Traumatic diaphragmatic rupture is rare, sometimes life threatening and remains a diagnostic and radiographic challenge. Diagnosis is frequently delayed, which may result in a late intervention with a potential catastrophic outcome. We report a case of a chronic diaphragmatic hernia in a 65-year-old male, with a history of self fall. The patient presented to OPD with difficulty breathing. During examination, bowel sounds were heard in left hemithorax. Vitals recorded were normal, then plain chest radiograph showed bowel loops in left hemithorax. Computed tomography confirmed the diagnosis of a left-sided diaphragmatic defect with herniating stomach, transverse colon, splenic flexure. The patient was advised for surgical intervention. During exploratory laparotomy a 9 cm defect in the left hemi-diaphragm with herniation of the stomach, transverse colon, small bowel was identified. The hernia was reduced and the defect repaired with composite mesh. Left side ICD tube placed. Rectus was difficult to close, hence only skin was closed to prevent abdominal compartment syndrome. Laparoscopic repair was ideal but his pulmonary condition did not allow for the same. The patient had an episode of segmental pulmonary thrombosis which was treated conservatively and later had uneventful recovery and remained well at a 1-month follow-up visit. Repair with nonabsorbable simple sutures is adequate in most cases, and the use of mesh should be reserved for chronic and large defects.

Keywords :- Diaphragmatic hernia, Abdominal compartment syndrome(ACS), Intercostal drainage(ICD), pulmonary thrombosis

Case report

A 65 year-old male presented to the General Surgery OPD with complaints of breathlessness since 2 years, being treated with MD inhalers by the local doctor. On enquiring the patient gave a history of self fall 20 years ago. On initial evaluation, his vital signs were stable. Chest examination revealed decreased breath sounds with bowel sounds heard in the left hemithorax. The abdomen was soft with occasional bowel sounds heard.

Computed tomography (CT) scan of the thorax and abdomen revealed left diaphragmatic hernial defect of 8.7 cm with herniation of stomach, small bowel and large bowel into left hemithorax.(Figure 1,2,3).



Figure-1

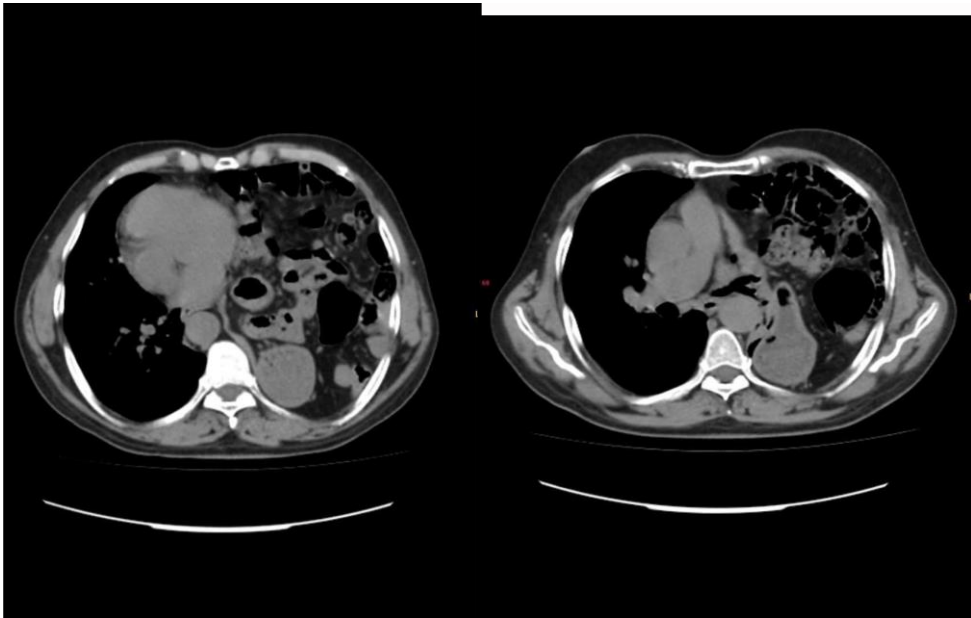


Figure-2

Figure-3

The patient was advised for a surgical intervention and taken to the operating room, an exploratory laparotomy was performed. The stomach, transverse colon, splenic flexure, 80% of small bowel were found within the left hemithorax, protruding through a 9-centimeter diaphragmatic defect (Figure-4,5).



Figure-4



Figure-5

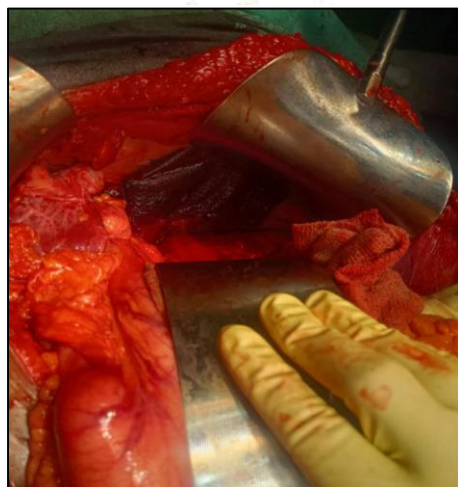


Figure-6

After reducing the hernia contents, a mesh repair was performed with interrupted prolene suture (figure-6), followed by the ICD tube placed in 8th intercostal space. Abdominal contents were not being closed by reduction in spite of component separation as there was too much tension. No biological mesh was placed, bagotta bag was not used for graded closure to prevent risk of fistula formation. Skin and subcutaneous tissue was closed after mobilisation by extending the incision inferiorly. External abdominal binder placed since post-op day 1. The patient developed segmental pulmonary vein thrombosis on post-operative day-13, and was treated conservatively for the by the cardiologist and was discharged later. His 1 month follow up has been uneventful.

Discussion

Diaphragmatic hernia is a herniation of the abdominal organs or tissues into the thoracic cavity. Traumatic diaphragmatic injuries are rare and usually occur after thoracic or abdominal blunt (2.9%) or penetrating (3.4%) trauma. The incidence of blunt traumatic diaphragm hernia in patients undergoing surgical exploration ranges between 3 and 8%.

However, the precise incidence of this injury is likely to be under-reported. Diaphragmatic injuries, in the absence of acute diaphragmatic hernias, are often missed by diagnostic imaging. The diagnosis can be difficult to make as the physical examination may be unremarkable, and imaging may initially fail to reveal the injury.

There are a lot of hypotheses about the mechanism of delayed presentation of a diaphragmatic rupture. Delayed rupture of a devitalised diaphragmatic muscle may occur several days or weeks after the initial injury.

Most of the traumatic diaphragmatic injuries (80-90%) occur in the left diaphragm because the left diaphragm is congenitally weaker than the right diaphragm which is protected by the liver. The clinical presentation is varied as patients may be asymptomatic, may have an acute presentation as shortness of breath, shoulder pain, epigastric pain or vomiting, or may manifest at a later stage, after adhesions are formed, as intestinal obstruction, strangulation or perforation.

The symptoms and signs are strongly associated with the size of the diaphragmatic defect, herniated organs and the existence of pulmonary disease. During initial assessment for trauma, most casualties will have a chest radiograph taken. The chest radiograph is an integral adjunct in the Advanced Trauma Life Support guidelines for the initial evaluation of the trauma patient, and is often the first clue to the presence of an acute diaphragmatic injury.

However, a chest radiograph may not be useful in some cases as signs are often masked by associated lung contusion, hemothorax, pneumothorax, pleural effusion, atelectasis, emphysema and non-specific elevation of diaphragm. Between 20-50% of patients who are later found to have a traumatic diaphragmatic injury have their initial trauma chest radiographs described as normal.

Traumatic diaphragmatic hernias are classified into three types depending upon the time interval for diagnosis:

Type 1 hernia - when the diagnosis is made immediately following trauma

Type 2 hernia - when the diagnosis is made within the recovery period

Type 3 hernia - when the diagnosis is made when the patient presents with ischemia or perforation of herniated organs.

CT scan of the chest has become an essential tool for the evaluation of a hemodynamically stable trauma patient. In the absence of an acute hernia, CT scans offer little benefit compared with conventional plain radiographs, as the sensitivity of the CT for the diagnosis of isolated diaphragmatic injury is limited [1]. However, in the presence of herniation of abdominal organs into the thoracic cavity, the sensitivity of oral contrast-enhanced CT scan is close to 95%. It is especially helpful if the plain chest radiograph is obscured by the presence of a hemothorax or a lung contusion.

The various significant signs which have been described in literature for blunt diaphragmatic rupture are as follows: diaphragm discontinuity, Segmental non-recognition of diaphragm, "Dangling diaphragm" sign, "Dependent viscera" sign, Intrathoracic herniation of abdominal contents, "Collar sign", Elevated abdominal organs, Thickened diaphragm, Thoracic fluid abutting intra-abdominal viscera.

Traumatic rupture of the diaphragm is considered an indication for surgical repair, especially in symptomatic patients. The onset of complications carries highest mortality and morbidity rates. This makes emergency surgery mandatory.

Two principles must be followed when repairing acute traumatic diaphragmatic hernias: complete reduction of the herniated organs back into the abdomen and watertight closure of the diaphragm to avoid recurrence. Repair with non-absorbable simple sutures is adequate in most cases and the use of a mesh should be reserved for chronic and large defects. In some series, suture with absorbable sutures are associated with a higher rate of recurrence.

In patients with giant diaphragmatic hernias, synthetic or biologic grafts can be used for a tension free repair and prevention of recurrence [6]. It should always be considered that, the use of prosthetics may be of benefit in the repair of chronic diaphragmatic injury, but it carries a high rate of infection in the acute setting, especially in the presence of hollow viscous injury in the abdomen .

Laparotomy or thoracotomy are the traditional surgical approaches for patients with diaphragmatic rupture, the choice being largely dependent on the skill set of the surgeon involved.

However, given the high rate of associated injuries to intra-abdominal organs, it is generally recommended to approach the diaphragmatic injury through an abdominal approach rather than thoracic approach.

Most dreaded complication of long standing hernia is the risk of abdominal compartment syndrome - increase of intra-abdominal pressure above 20mmHg with organ dysfunction , leading to decreased cardiac output & increased central venous pressure due to IVC and portal vein compression, increase in systemic vascular resistance leading to hypotension. Pulmonary system is involved as decreased thoracic volumes due to compression of diaphragm. Renal vessel compression leading to decreased GFR and low urine output, reduced visceral blood flow. Intra-abdominal pressure can be measured using direct methods like pressure transducers or intraperitoneal catheters, but most commonly used method is by measuring intravesical catheter pressures

Currently available techniques to prevent ACS in this scenario is by serial pneumoperitoneal accomodation, baggotta bag technique, serial closure of rectus sheath , and in this case direct skin closure without rectus approximation.

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