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Case Report: Late Presentation of a Case of Traumatic Left Sided Diaphragmatic Hernia

Rajendra Shinde[1], Sanjeev Kumar[2]

[1]Assistant Professor, Department Of General Surgery, Mahatma Gandhi Misson's Hospital and Medical College, Aurangabad, India

[2]Resident in Department of General Surgery, Mahatma Gandhi Misson's Hospital and Medical College, Aurangabad, India

Abstract: ***An injury that involves laceration/penetration/Blunt trauma may result in herniation of the abdominal viscera in to the thorax which may or may not have been associated with eventration of the diaphragm is typically said to be a case of diaphragmatic hernia. Blunt traumatic diaphragmatic injuries are a result of a rapid increase in the intra-abdominal pressure during the anterior impact that causes a blow out of the diaphragmatic tissue. Here we present to you a case of poly trauma of a 32-year old male patient who presented to the surgery OPD with complaints of breathlessness on exertion post trauma after 2 months.***

Keywords: diaphragmatic hernia, defect

1. Introduction

Disorders of the diaphragm can be broadly classified as the disorders of innervation, leading to paralysis of the diaphragm with elevation and reduction of the thoracic volume leading to breathlessness and disorders of anatomy which are further categorized into congenital diaphragmatic hernias or acquired hernias usually secondary to trauma.[1] Traumatic diaphragmatic hernia usually result from a blunt injury/penetrating injury. These hernias maybe recognized during the period of hospitalization immediately following the truma or a later presentation.[2]The mortality in these cases are usually due to associated injuries which often masks the signs and symptoms of the hernia and delay the diagnosis leading to increased mortality and morbidity. If the diaphragmatic hernia is not recognized in the immediate post traumatic period the patient may recover or may remain symptom free/suffer from chronic abdominal and/or chest symptoms/present with acute crisis often with signs of intestinal obstruction/strangulation.[1]Hence prompt and early surgical intervention reduces the mortality and morbidity significantly.[2]

2. Case Report

A 32-year-old male patient had presented to the surgical OPD with mild dyspnea on exertion after a history of fall from 7 feet around 2 months back and was managed conservatively in a nursing home. There were no signs and symptoms of bowel obstruction/strangulation, shock. patient's physical examination revealed breath sounds lowered in the left lung field and presence of bowel sounds with a scar of ICD. CECT abdomen and pelvis revealed disruption of the left hemidiaphragm with herniation of the stomach, splenic flexure and omental fat through the defect(45mm) s/o Traumatic diaphragmatic hernia, with plain chest x-ray showing the herniation of the stomach in to the left hemidiaphragm. CT brain were S/O bilateral resolving hemorrhagic contusions. MRI spine of the patient revealed anterior wedge compression fracture of the L1 vertebral body. Patient was optimized and taken for an elective laparoscopic assisted open diaphragmatic hernia repair. where in the defect was closed laparoscopically after reducing all the contents from the left hemithorax and making sure the entire content was viable. The defect was closed with non-absorbable suture material (prolene 2-0 rb) following which a left subcostal incision was take and a polypropelene mesh was fixed above the defect and fixed with prolene 2-0 rb. A left pelvic drain was fixed, and a left ICD was inserted and fixed respectively. The procedure was uneventful. The post period was uneventful following which the patient was kept on regular spirometry and prophylactic antibiotic coverage.

3. Discussion

Traumatic diaphragmatic hernia is usually a result of road traffic accidents leading to blunt trauma/laceration to the abdomen resulting to the eventration of the diaphragm or pressure significant enough to the raise the pressure > +150-200 cmH20 and eventually leading to a hernia (left>right

Figure 1: Preoperative chest X-ray

Figure 2: Preoperative CT Thorax

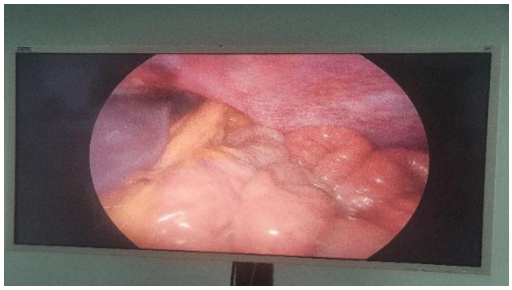

Figure 3 (a): Intraoperative photo showing the bowel loops and the stomach herniating into the left hemithorax through a defect in the diaphragm. The omentum is adhered to the previous ICD site

Figure 3 (b): Intraoperative photo showing the reduction of the bowel loops from the defect approximately measuring about 45mm

Figure 3 (c): Intraoperative photo showing the closure of the defect with prolene 2-0 RB after reduction of the contents into the abdominal cavity

Figure 4: Post Operative Day – 5

and most commonly in the posterolateral aspect) which usually if is not intervened early may present with bowel obstruction features which is associated with increased mortality and morbidity.[3]This devastating outcome of the diaphragmatic injury was reported by ambroise pare in 1579, when he discussed a French artillery captain who initially survived a gunshot wound to the abdomen but later died eight months later. At autopsy, strangulated and gangrenous colon was found in the chest. The colon had herniated through a defect in the diaphragm that would only admit “tip of the little finger”.[4]

Hence traumatic diaphragmatic hernia is thought to be produced by a sudden increase in the pleuroperitoneal pressure gradient occurring at the areas of the potential weakness along the embryological points of fusion.[5] Thus usually 3 clinical phases follow the onset of traumatic diaphragmatic hernia that are as follows:[6]

- Initial/ acute phase begins with the orginial trauma and ends with the apparent recovery from the other injuries. It is during this phase that prompt management of the condition has to be taken place and that the hernia is likely to go undiagnosed
- Immediate/latent phase, symptoms are chronic in nature and may closely resemble gallbladder disease, peptic ulcer disease, partial intestinal obstruction or coronary heart disease
- Obstructive phase may occur at any time to terminate the latent phase. The incarcerated viscera become obstructed, leading to necrosis if the condition is not identified.

Hence the injury to the diaphragm correlates to the occurrence of the diaphragmatic hernia.

Table 1: Diaphragm injury grades

Grade 1: contusion over the diaphragm
Grade 2: laceration <2 cm
Grade 3: laceration 2 to 10cm
Grade 4: laceration >10cm with tissue loss <25cm square
Grade 5: laceration and tissue loss >25cm square

† grades above 2 are associated with higher incidence of diaphragmatic hernia.[4]

These injuries are picked upon routine chest x-rays have various signs like visualization of the stomach or abdominal organs in to the chest, elevation of the diaphragm, abnormal positioning of the ryles tube and basilar atelectasis.[5]

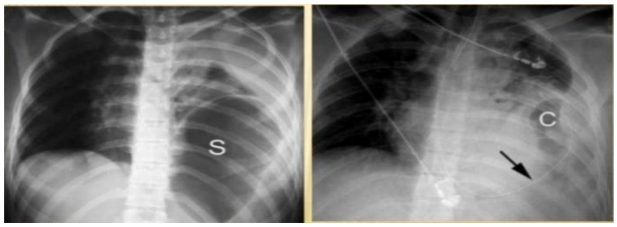

Figure 5: Chest x-rays showing elevation of thehemidiaphragm and abnormal placement of the ryles tube

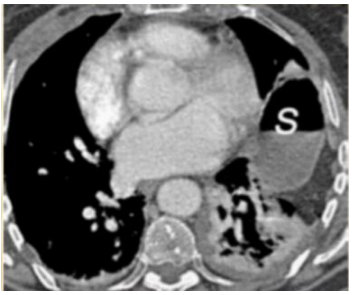

Figure 6: CT thorax may be show herniation of the contents into the chest wall through a defect in the diaphragm

Hence the delayed and missed diagnosis have resulted into 2 hypothesis: delayed rupture and delayed detection.[2]The delayed rupture may occur when the diaphragm muscle is devitalized at the time of injury but remains as a tenuous barrier against herniation until several several days later until the inflammatory process that weakens it.[4] Delayed detection simply describes a diaphragmatic defect that only becomes evident when the herniation occurs sometime after admission, most typically on extubation when the intra thoracic pressure becomes negative which emphasizes on the fact that meticulous inspection and palpation of the entire diaphragm must take place to rule out any defect during exploratory laparotomy for trauma cases.[2]

The treatment of the traumatic diaphragmatic hernia is the surgical repair and should be repaired immediately after the diagnosis is confirmed.[3]In the diagnosed cases of the left sided hernia , the abdominal approach is preferred because it generally allows for adequate exposure with repair of the defect associated intra- abdominal injuries.[3]Right sided lesions are often difficult to repair through an abdominal incision and is usually repaired through thoracotomy with reduction of the contents and closure of the defect. [1]

4. Conclusions

It is a common diagnosis in the severely injured person and one must often perform a exploratory laparotomy. Careful visualization and manual inspection of the entire diaphragm is necessary to avoid missed diaphragmatic defects. Additonal imaging modalities such as CT and MRI may play a role in studying the stable traumatized patient with a persistant abnormality on the chest radiograph such as pleural effusion, elevated hemidiaphragm, lower lobe collapse and visualization of the viscera and colon into the hemithorax. The high frequency of associated injuries combined with 70% chance of missing the diagnosis on a routine chest radiograph pointing to the need a high index of suspicion to avoid the sequale of the missed injuries. Optimal treatment consists of early repair through and abdominal approach with careful attention to the associated injuries. The outcome is dependent almost entirely on the severity of these associated injuries.

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