Delayed Presentation Of Traumatic Diaphragmatic Hernia After 28 Years Of Initial Trauma: Treated Laproscopically

G Shilpi, S Onkar, S Sumit, R Mathur

Citation

Abstract
Introduction: Severe external blunt or penetrating trauma to the abdomen and/or chest is the most common cause of traumatic diaphragmatic hernia (TDH). Delayed TDHs, which develop after a period of one month following trauma, are observed in about 10% of diaphragmatic injuries. The stomach and colon are the most common organs found to be herniated. Most patients with delayed TDHs present with acute GI and/or respiratory symptoms, although, for the intervening period, they may be completely asymptomatic, or may give on and off history of mild symptoms. Helical CT has high sensitivity for detection and gives detailed information about the exact anatomy. Transthoracic approach for repair of delayed TDH is preferred. Laparoscopic, thoracoscopic, or combined techniques are also available for repair of TDHs. Here we present an interesting case of delayed TDH, presenting after a very long asymptomatic interval of 28 years of initial trauma. The patient was successfully treated by repair done laproscopically.

Conclusion: This case report emphasizes the possibility of delayed presentation of TDH even after very long intervals, and its laparoscopic repair, as one of the available treatment options.

CASE
We present a case of a 52-year-old patient presented to the casualty department with complaints of acute onset chest pain, respiratory distress and epigastric abdominal pain for the last four hours. Absolutely no other problem was associated. The only significant history was that of a stab injury on the left side of the abdomen 28 years back, for which laparotomy and primary repair of a jejunal tear was done. The patient remained apparently well since then. On examination, air entry was found to be decreased on the left side of the chest. PA view of chest X-ray showed an elevated left dome of the diaphragm with a large air-fluid level in the left thoracic cavity, and the heart shifted towards the opposite side. Another chest film was taken after insertion of a nasogastric tube (Fig. 1) which confirmed intrathoracic herniation of the stomach. A lateral X-ray film (Fig. 2) of the chest was done which demonstrated few bowel loops herniated into the left thoracic cavity along with and posterior to the stomach.

Figure 1
Figure 1: Chest radiograph, PA view; large air-fluid level in the left thoracic cavity with nasogastric tube within it; also note shifting of the heart shadow toward the right side.
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Figure 2
Figure 2: Lateral CXR; few bowel loops herniated into the left thoracic cavity along with and posterior to the stomach can easily be identified.

Figure 3
Figure 3: CT scan of chest & upper abdomen (coronal section); herniation of stomach & splenic flexure of colon, along with collapse of lung and mediastinal shifting to the opposite side, can be seen.

Nasogastric tube insertion and suction of gastric contents relieved respiratory distress to some extent. Arterial blood gas analysis and other blood investigations were all normal. Computerized tomography (CT) of chest and upper abdomen with contrast revealed a focal defect in the left hemi-diaphragm postero-medially causing herniation of stomach and splenic flexure of colon (Fig. 3,5) along with left gastric and left colic vessels, thus confirming the diagnosis of left diaphragmatic hernia. Passive atelectasis of the left basal lung parenchyma was also noted on CT scan (Fig. 3,4,5).

Figure 4
Figure 4: CT scan of the chest (transverse section at the level of the aortic arch); the stomach can be clearly seen in the left chest cavity with collapse of lung.
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Figure 5
Figure 5: CT scan of chest (sagittal section in supine position); focal defect in the left hemi-diaphragm with herniation of stomach and splenic flexure of colon. Also note passive atelectasis of left basal lung parenchyma.

Elective laparoscopic retrieval of herniated contents and repair of the diaphragm with polypropylene mesh was performed. Chest radiographs on the fourth postoperative day showed complete expansion of the left lung and no recurrence. The patient recovered uneventfully and was discharged on the fifth postoperative day.

**DISCUSSION**

Traumatic diaphragmatic hernia (TDH) usually results from severe external blunt injury or penetrating injuries. The first traumatic diaphragmatic hernia was reported by Sennertus in 1541. Injuries to the diaphragm may be followed by immediate herniation of abdominal viscera into the chest. These hernias may be recognized during the immediate period following the initial trauma; the immediate type of diaphragmatic hernia (DH) as described by Carter et al. However, it is widely accepted that herniation may be delayed, especially, smaller tears may not lead to immediate signs of herniation. Also hernias developed at the time of injury may present months or even many years after apparent recovery from the traumatic incident.

Smaller diaphragmatic hernias may not become obvious until months or years after injury when patients present with strangulation of intra-abdominal organs, dyspnoea, or nonspecific gastrointestinal complaints. Delayed TDHs are defined as those, which present one month or more after trauma. Traumatic diaphragmatic hernias, when diagnosed many years after the traumatic event, are observed in about 10% of diaphragmatic injuries. Due to coexisting injuries and the silent nature of diaphragmatic injuries, the diagnosis is easily missed or difficult. Other rare causes of traumatic rupture include labor in women with a history of congenital or repaired diaphragmatic hernias, and barotrauma during underwater dives in patients with history of Nissen fundoplications.

Decreased function of the diaphragm, intrathoracic abdominal contents leading to compression or passive collapse of lung, and shifting of the mediastinum and heart lead to circulatory and respiratory depression. Also, occlusion of blood supply of the herniated viscera causes their strangulation.

The stomach and colon are the organs most commonly found within the chest. Nursal et al. analyzed records of 26 patients, who were treated for diaphragmatic hernias and found the stomach to be the most common herniated organ. Patients presenting long after injury may remain completely asymptomatic during the intervening period, or may give occasional history of mild GI and/or respiratory symptoms. Occasionally, patients of TDH are symptom-free and their hernias are found on a routine chest film. However, the majority have symptoms which vary according to the organ herniated into the chest, and whether or not that organ is strangulated or obstructed. Most patients with delayed presentation of traumatic diaphragmatic hernias present with acute symptoms. These may be those of classic intestinal obstruction with abdominal pain and distention, vomiting, and fluid levels on abdominal films or upper abdominal and/or chest pain with vomiting and respiratory distress. The differential diagnosis includes cholecystitis, pancreatitis, exacerbation of a peptic ulcer, myocardial infarction, pneumonia or even pneumothorax.

Physical signs are of little aid unless the diagnosis is already suspected.

Detailed history of signs and symptoms and critical examination of the patient can suggest the diagnosis. Chest X-ray is the most sensitive investigation for detecting left-
sided diaphragmatic hernias. A film taken after the passage of a nasogastric tube may confirm the diagnosis. Lateral films can show bowel loops in the chest cavity, behind the stomach, which could not be appreciable on an ante- posterior film. Ultrasonography of the chest has been reported to detect diaphragmatic hernias. During visualization of each upper quadrant, the movement of the diaphragm was noted to be decreased in patients with diaphragmatic hernias. Helical CT has the advantage of increased sensitivity of 71-100%. It can give detailed information about the contents and their blood supply.

As, unfortunately, there is a significant number of patients with blunt and penetrating abdominal trauma in whom minor injuries to the diaphragm go undetected and may present as diaphragmatic hernia in later life; Murray et al. proposed performing a diagnostic laparoscopy or thoracoscopy in order to reduce this number of patients with occult diaphragmatic injuries. Ebert et al. stressed that laparotomy done for initial trauma should include careful inspection of the diaphragm for any defects which, if present, should be repaired.

Treatment is usually surgical which depends upon the size of the defect and status of herniated viscera. Diaphragmatic hernias do not have a true hernia sac, and the reduction of larger portions of viscera (stomach, spleen, and bowel) from the chest can be hindered by adhesions between the abdominal and thoracic structures, and there can be an increased risk of causing iatrogenic injuries due to the awkward exposure through the abdomen. Since patients often have adhesions within the chest which can easily be freed from inside of the chest, a transthoracic approach in traumatic diaphragmatic hernias with delayed presentation is preferred by most authors. If required, it can be extended into a thoraco-abdominal approach incision. Surgical treatment involves freeing of adhesions followed by retrieval of contents back into the abdominal cavity and repair of the residual defect, which of course depends upon its size. Interrupted horizontal sutures can be used for small defects, but large defects might eventually require synthetic mesh. Use of minimally invasive techniques for repair of DH is becoming more common than before. With advances in technology and surgical skills, repairing both acute and chronic diaphragmatic hernias is possible with laparoscopic, thoracoscopic, or combined approaches. Patients with complicated TDH such as containing gangrenous or perforated viscera will rapidly develop empyema, which requires complete drainage and complete re-expansion of the lung. Thus, if such pathology is suspected, approach should always be through the chest followed by taking down adhesions and decorticating the lung.

Our case is interesting as presentation was after a very long asymptomatic period of 28 years after initial trauma. Also, laparoscopic treatment of TDH is still a challenge for modern surgery, and there are not enough publications on the problem.

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CORRESPONDENCE TO

DR. SHILPI GUPTA SENIOR RESIDENT OF SURGERY, DEPARTMENT OF SURGERY, M.G.M. MEDICAL COLLEGE & M.Y. HOSPITAL, INDORE, MADHYA PRADESH, INDIA-452001 (CONTACT NO.: +91-94253-42100) (Email: drguptashilpi@gmail.com)

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Author Information

Gupta Shilpi, M.B.B.S., MS (Gen Surg)
Senior Resident of Surgery, Department of Surgery, M.G.M. Medical College & M.Y. Hospita

Singh Onkar, M.B.B.S., MS (Gen Surg)
Senior Resident of Surgery, Department of Surgery, M.G.M. Medical College & M.Y. Hospita

Shukla Sumit, M.B.B.S., MS (Gen Surg)
Associate Professor, Department of Surgery, M.G.M. Medical College & M.Y. Hospita

Raj K. Mathur, M.B.B.S., M.S. (Gen Surg), F.I.C.S.
Professor of Surgery, Department of Surgery, M.G.M. Medical College & M.Y. Hospita