


Case Report

Pneumoperitoneum due to a missed diaphragmatic herniaA R M Isthiyak^{1*}, Anura Banagala¹, Amila Jayasekara¹¹National hospital of Sri Lanka, Colombo, Sri Lanka.**Abstract**

Diaphragmatic hernia is a condition where the abdominal contents can protrude into the thorax. Despite their rarity, hernia-related complications can have fatal results if treated late. In literature, the hernial contents of the stomach, spleen, pancreatic tail, small intestine, and colon are frequently mentioned.

We describe a case of a 33-year-old patient who had a diaphragmatic hernia that was undetected. The patient complained of severe epigastric pain and abdominal pain, which was later determined to be an ischemic gastric perforation. Then total gastrectomy and esophago-jejunostomy along with repair of the diaphragmatic defect was performed. This case illustrates the necessity of having a high degree of suspicion and early discovery of a diaphragmatic hernia for improved patient outcome.

Keywords: Diaphragmatic hernia, Pneumoperitoneum, Strangulation, Perforation

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Introduction

Diaphragmatic hernia (DH) is a defect in the diaphragm that allows protrusion of abdominal contents into the thoracic cavity. Diaphragmatic hernias may be congenital or acquired. Congenital diaphragmatic hernias are the most common entity, however, acquired diaphragmatic hernias are less frequently diagnosed. Despite the rarity, complications related to hernia may lead to lethal consequences if not addressed in time [1]. The organs such as the stomach, spleen, tail of the pancreas, small intestine and colon are frequently noted hernial contents in literature. This case report describes gastric perforation in an adult patient with a diaphragmatic hernia.

Case Report

A 33-year-old male presented to the medical casualty ward complaining of severe epigastric discomfort and worsening abdominal pain for one day duration. The epigastric pain was associated with repeated non-bilious vomiting and he believed that all these symptoms appeared soon after the heavy meal he had on the previous day. Before this admission, he was in good health except for the burning epigastrium that he usually develops following binge alcohol intake for a period of 3 years. In such instances, the pain had eased with antacids. This time, he denied any recent alcohol intake. He had no history of major trauma, hospitalization or surgery in the past.

Upon examination, he was anxious, ill-looking, diaphoretic and dehydrated with a heart rate of 110 bpm, respiratory rate of 24 cycles/min and temperature 36.9°C. Abdominal examination revealed gaseous distention and generalized tenderness in all quadrants. Apart from tachypnea, bi-basal reduction in air entry was noted in the respiratory examination. Immediate electrocardiogram (ECG) and Troponin I were ordered within 2 hours which were found to be normal and thereby acute coronary syndrome was excluded.

Laboratory investigations were immediately performed including Full blood count (FBC), C-reactive protein (CRP), Renal Function Tests (RFT) and Liver Function Tests (LFT) and said to be within normal range except the serum amylase 394 (normal range: 30–110 IU/L). Chest x-ray showed left hemi-diaphragmatic elevation with pneumoperitoneum (Figure 1A).

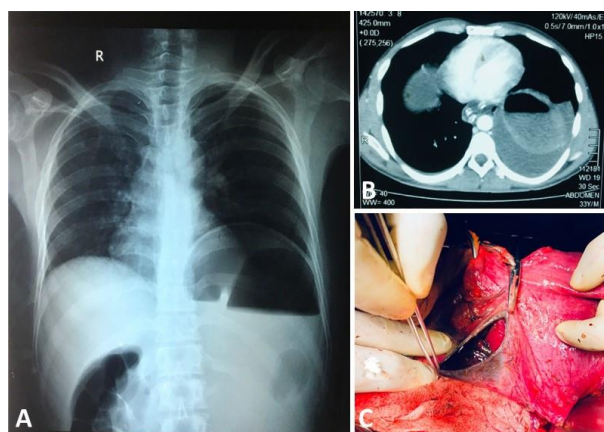


Figure 1: A, Chest x-ray showing left hemi-diaphragmatic elevation with pneumoperitoneum; B, Computed tomography scan showing protrusion of abdominal contents into left thoracic cavity; C, Intra-operative photo depicting gastric perforation at the fundus.

Further imaging studies were requested for better understanding. The computed tomography (CT) scan revealed mesentrio-axial gastric volvulus with evidence of wall ischemia, possible perforation and cranial displacement of the stomach could be due to posterior diaphragmatic hernia with the intact pleuro-peritoneal interface.

Emergency laparotomy was planned due to the worsening of vital parameters (154 beats per min and systolic blood pressure of 80mmHg) and generalized abdominal tenderness. Gross contamination of the

peritoneal cavity with partially digested food particles and herniation of the fundus of the stomach and spleen through the weakened part of the diaphragm were observed intraoperatively (Figure 1B). After the division of the left coronary ligament, the left lobe of the liver was mobilized. Then hernial contents (fundus of stomach and spleen) were reduced into the abdomen by blunt dissection. The stomach was found to be ischemic and there was a 3x5cm defect at the fundus of the stomach due to perforation (Figure 1C). Spleen was normal in colour and consistency. There was approximately 7 cm size weakened area in the left dome of the diaphragm.

The peritoneal cavity was thoroughly irrigated with plenty of warm saline to remove food residues. Then total gastrectomy and esophago-jejunostomy along with repair of the diaphragmatic defect was performed. A jejunal Roux-en-Y loop was raised and end to side 25mm circular stapler esophago-jejunostomy was done. The weakened area of the diaphragm was plicated abdominally with a non-absorbable (3/0 Prolene) suture. A subhepatic drain and pelvic drain were left *in situ* and secured to the anterior abdominal wall. The patient was admitted to the surgical Intensive Care Unit for close monitoring and the patient received broad-spectrum antibiotics (Intravenous Cefuroxime 750mg tds and Metronidazole 500mg tds) during and after surgery. He was extubated on the second day following the surgery. The patient made a slow but uncomplicated recovery. The gastrograffin study was performed on the 8th day of surgery and anastomotic site integrity was reassured. He was discharged from the ward on the 12th day following the surgery. A week after the discharge, the patient came for review and the surgical site was found to be completely healed. The histopathology report revealed a gangrenous stomach with evidence of perforation.

Discussion

Unlike the congenital diaphragmatic hernia which is the commonest type, acquired ones are commonly seen in the setting of trauma (immediately following the trauma or as a late presentation). Most of the congenital types come into light during the intrauterine period or soon after the delivery presenting with neonatal respiratory distress if missed can present during adulthood [2]. The highlight of this case report is diaphragmatic hernias should be suspected in adults even when there's no history of chest or abdominal trauma.

The site of the pain which is in the epigastrium, initially led to medical casualty ward admission to exclude acute coronary event. Due to the diagnostic conundrum, there was 12 hours delay in call for surgical referral. It is worth mentioning that delayed diagnosis of gastric perforation can lead to undesirable consequences [3].

Given the history of alcohol consumption, epigastric pain at presentation and elevated serum amylase prompt us to make the diagnosis of acute pancreatitis. Elevated serum amylase levels in gastroduodenal perforations are of significance primarily because they confuse the picture which otherwise might be typical of perforation [4]. The clinician should always think about the possibilities of extra-pancreatic causes of elevated serum amylase. When there is high suspicion of perforation and the serum amylase value is abnormally high, yet pneumoperitoneum cannot be demonstrated, the clinician should use other methods (like clinically demonstrating the absence of liver dullness or erect chest x-ray to look for gas under the diaphragm) to demonstrate whether perforation has occurred.

In this case, we demonstrated the weakening at the posterolateral part of the left hemi-diaphragm plus the absence of trauma history favours late presentation of congenital diaphragmatic hernia [5]. The incidence of diaphragmatic hernia is more on the left side because

the right hemidiaphragm being comparatively stronger than the left and the interposition of the liver in the right side preventing right-sided hernias. The presentation of a diaphragmatic hernia can vary, from an asymptomatic hernia to a full-blown acute abdomen. Interestingly, respiratory complaints are commoner than the abdominal complaints [7]. Massive haematemesis and splenic vein thrombosis being the other modes of presentation of herniated gastric fundus [6].

Diaphragmatic hernias should be operated in order to avoid pulmonary and abdominal complications. Most hernias could be reduced abdominally but rarely thoracotomy is necessary [7]. However, when there is a history of trauma recently before the presentation, laparotomy would be adequate. When there is a long-standing hernia, most surgeons prefer for thoraco-abdominal incision anticipating adhesions and difficult dissection. For elective diaphragmatic hernia, repair mesh can be considered, which was not preferred in this case due to the peritoneal gross contamination.

Conclusion

High-degree of suspicion and early detection of diaphragmatic hernia drastically decrease the morbidity and mortality and improve the patient outcome.

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