

CLINICAL VIGNETTE

Diaphragmatic Hernia: A Rare Cause of Acute Onset Chest Pain

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A 26-year-old male presented to the emergency department with acute onset, left-sided chest pain one hour after lifting heavy objects while at work. The patient's pain was pleuritic and sharp with associated shortness of breath. His pain was worse with movements and stretching. He reported diaphoresis but no nausea or vomiting. He denied any direct injury to the left chest wall. He had no recent travel, prolonged immobilization, leg pain or swelling, or an unremarkable past medical history. There was no alcohol, tobacco, or drug use. He had no history of chest pain or family history of coronary artery disease.

Presenting vital signs included: blood pressure of 100/67, heart rate of 115 beats per minute, respiratory rate of 28 breaths per minute, and temperature of 36.9 degrees Celsius. The patient was oxygenating 91% on room air and appeared in obvious respiratory distress with significant tachypnea. He was diaphoretic and appeared to be splinting with each inspiration. Lungs were clear on examination. There was no reproducible tenderness to palpation of the chest wall on exam. Cardiac exam was normal except for tachycardia. His abdominal exam was essentially benign except for mild left upper quadrant tenderness.

The patient was treated with pain medications with improvement of his symptoms. An EKG showed sinus tachycardia with a heart rate of 120 but no ischemic changes. A chest x-ray was normal. Laboratory testing including complete blood count, chemistries, troponin, and d-dimer were all within normal limits.

With pulmonary emboli still in the differential diagnoses, a CT chest angiogram was ordered, which showed a diaphragmatic hernia on the left with incarcerated bowel in the thoracic cavity as indicated in Figure 1.

A surgical consult was obtained and patient underwent laparoscopic repair of his diaphragmatic hernia.

Discussion

The most important muscle of respiration is the diaphragm. It separates the thoracic and abdominal cavities. A diaphragmatic hernia represents a deficit that allows abdominal structures to protrude into the thoracic cavity. The two major categories of diaphragmatic hernias are congenital and acquired. Acquired defects are usually due to a blunt or penetrating trauma. Diaphragmatic rupture is a relatively rare

injury with a reported incidence of 0.8-5% of all patients following a significant blunt trauma.¹ Non-traumatic or spontaneous diaphragmatic rupture is rare. Though spontaneous diaphragmatic rupture implies the absence of trauma, there is always a possibility of a forgotten traumatic event in the past or the presence of a structural abnormality that ruptured under significant stress.² Spontaneous diaphragmatic hernia ruptures have been reported in weightlifters, dancers, and athletes. This rare phenomenon has also been reported during labor, severe emesis, and even cough related to pertussis.^{3,4} The patient described in our case report likely developed spontaneous rupture as a result of increased intra-abdominal pressure while lifting heavy objects related to his job. There is also a small chance that a small congenital diaphragmatic hernia has now presented in adulthood after remaining undetected during childhood. Most injuries to the diaphragm are left sided. In one study of nearly 1600 patients, 75% had left sided injuries, 23% had right-sided injuries, and 2% had bilateral injuries.⁵ The presence of the liver protects the diaphragm in the right hemithorax. Therefore, fewer injuries occur to the right side of the diaphragm.⁶

The differential diagnoses for someone presenting with sudden onset chest pain as in the patient featured in this case report include pneumothorax, hemothorax, pulmonary embolism, acute coronary syndrome, or an esophageal injury such as Boerhaave's syndrome.

Though a chest X-ray is routinely performed for most complaints of chest pain, it has very low sensitivity in depicting diaphragmatic rupture. A helical CT scan of the chest and abdomen is recommended for diagnoses for suspected diaphragmatic injuries.^{7,8} Surgical repair, either open or laparoscopic, is the gold standard for treatment of diaphragmatic hernias.⁹

In conclusion, diaphragmatic rupture is difficult to diagnose in a patient presenting with acute onset chest pain. Therefore, a high index of suspicion in conjunction with appropriate imaging modalities is needed to make this diagnosis. Early surgical repair is necessary to reduce morbidity and mortality related to this rare condition.

Figures

Figure 1. CT scan showing loop of bowel in the left hemithorax.



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