Delayed Presentation of Traumatic Diaphragmatic Hernia Due to Stab Wound: Still Missing the Diagnosis

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Descriptions of diaphragmatic hernias (DH) due to trauma have been presented in the literature for over eight decades, yet the diagnosis is still often missed. There are successful techniques available for diagnosing and correcting the condition. A delay in the diagnosis of traumatic DH can be deadly to the patient. Therefore, timely and accurate identification and intervention is both imperative and achievable. Here we present a case of delayed presentation of DH due to stab wound two years after the initial trauma. The DH was successfully surgically repaired using mesh. The case illustrates some of the signs and symptoms of the delayed presentation of DH. The best way to initially screen for the possibility of DH is to complete a comprehensive history with the patient including any traumas to the area, even if minor. Laparoscopy at the time of a trauma is very successful in detecting DH.

INTRODUCTION

A 20-year-old male presented to the emergency department with constipation for three days and vomiting for one day. The patient had a past medical history of left-sided pneumothorax due to a stab wound two years prior to current admission. The pneumothorax was treated successfully with chest tube placement at another institution. He had no other significant past medical history and did not currently use any medications. He smoked approximately 10 cigarettes per day (duration unknown) and drank alcohol occasionally.

At time of admission, the vital signs were unremarkable. Physical exam revealed upper left quadrant tenderness without any rigidity, guarding or abdominal distension. Bowel sounds were present; initial laboratory findings were normal. Abdominal x-ray revealed mild distension of transverse colon and suspected splenic flexure pathology. CT scan of the abdomen (Figure 1) showed a small amount of fluid immediately adjacent to subdiaphragmatic left upper quadrant. A 1.4 cm oval-shaped structure was seen adjacent to
the splenic flexure. There was mild dilation of the transverse colon to the level of the splenic flexure. Subsequently, hypaque-enema (Figure 2) showed that, at the level of the proximal descending colon just distal to the splenic flexure, there was acute stricture. Only a small amount of contrast proceeded proximal to this region of the stricture. Following evacuation, air was introduced and the distal colon distended (Figure 3). The region of the stricture, however, remained unchanged. Contrast material did not flow retrograde to the transverse colon.

Colonoscopy was performed. The colonoscope passed through the rectum up to the proximal descending colon and splenic flexure area which showed narrowing with normal mucosa (Figure 4). The colonoscope was unable to move past the narrowing. At this point, two possibilities for the narrowing were suspected, either volvulus or diaphragmatic hernia. Laparoscopy revealed a small loop of the colon that was clearly herniating through the diaphragm into the left chest. After reducing the loop and debridement of the area, a 3 cm oval deficit was seen. The hole in the diaphragm was repaired using mesh and the abdomen was closed. The patient recovered uneventfully over the next few days and was discharged home.

It is hypothesized that the injury was caused by the stab wound two years prior but was not suspected until the current onset of acute symptoms.

**DISCUSSION**

Acquired DH often occurs as a result of blunt trauma (e.g. during car accident, gun shot wound, stab wound) (1). Acquired DH frequently goes unrecognized at the time of trauma for a number of reasons. A massively distended stomach can easily be misdiagnosed as pneumothorax or hydropneumothorax (2), as was the case in our patient. A traumatic DH can also be missed due to lack of symptoms (3). In general, when patients with acute trauma and DH are initially examined, nearly 25% have normal abdominal assessments (4). Thirty-two percent [32%] of patients with occult diaphragmatic injuries from stab wounds to the chest area initially have normal chest x-rays (4). Furthermore, DH often occurs in concert with other traumatic abdominal injuries, making the DH more difficult to
Delayed Presentation of Traumatic Diaphragmatic Hernia

A CASE REPORT

detect. For these reasons, even if initial examinations are negative for DH, follow-up should be performed.

When symptoms of delayed-onset DH manifest, they can be diverse and are often non-specific in nature. There may be reoccurring gastrointestinal symptoms, such as abdominal pain, vomiting and constipation. Respiratory symptoms can be in the form of cough, dyspnea or respiratory distress. Fever is also common in patients with DH. The best way to rule-out possible DH in patients with these types of diverse symptoms is to collect a comprehensive history including all past traumas to the chest and abdominal areas, even if mild in nature.

DH should be suspected even after a mild trauma if chest x-ray shows absence of fundic bubble in its normal position. Lateral chest x-ray may aid in diagnosis (2). Abnormal findings on initial chest x-ray (such as hydropneumothorax) or ultrasound findings (such as interruption of the diaphragm) should invoke suspicion of a diagnosis of DH. Laparoscopy has proven to be an excellent tool for detection of diaphragmatic injury after penetrating thoracoabdominal injury (3).

As mentioned earlier, even if the initial chest x-ray is negative, a follow-up chest x-ray two-to-four weeks after discharge is recommended (4).

Immediate surgical repair is always indicated in cases of DH. As long as there is no perforation of the intra-abdominal organs into the chest, the transthoracic approach is preferred. In the case of a complicated herniation (e.g. strangulation or perforation) laparotomy will be required, though it may be paired with thoracotomy. Extensive adhesion between the herniated viscera and the lung or the pericardium is difficult to remove through the pericardium. In this situation, a transthoracic approach and suture repair of the diaphragm is the best procedure (5).

Mortality rates from acquired DH range from 3% if detected early to 25% for delayed presentation (3). In 1989, one report found that 36% of delayed recognition DH cases in stab wound patients resulted in death (6). These rates are surprising given that some of the earliest cases drawing attention to this misdiagnosis date back to the 1940’s. For example, Caldwell & Preston (7) advised clinicians to be aware of a possible diagnosis of DH in cases of trauma with subsequent

(continued on page 46)
Delayed Presentation of Traumatic Diaphragmatic Hernia

A CASE REPORT

(continued from page 44)

obscure symptoms simulating thoracic or abdominal disease. Even given the long recognition of this problem, DH is still being overlooked as a possible complication in patients with abdominal and chest traumas. In the case of the patient presented here, there was an increased risk of mortality due to initial misdiagnosis and delayed onset of symptoms. Fortunately, upon presentation of acute symptoms two years after the initial trauma, the diagnosis was made in a timely fashion and the problem was successfully surgically corrected.

In summary, the case presented here illustrates the possibility of DH with an onset of symptoms two years after the initial trauma. Though many cases have been reported over the last 80 years, DH is still too often misdiagnosed or is not considered in patients experiencing trauma to the abdomen and chest. There is a very real possibility of the development of DH in patients after trauma and appropriate and timely screening and intervention is of utmost important.

References

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