

Intestinal obstruction. A rare delayed presentation of traumatic diaphragmatic hernia

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Traumatic diaphragmatic injuries, commonly occur following blunt and penetrating trauma, and due to coexisting injuries and the silent nature of diaphragmatic injuries, the diagnosis is easily missed or difficult during the first evaluation, resulting in chronic diaphragmatic hernia, strangulation, or both. Traumatic diaphragmatic hernias (TDH) when diagnosed many years after the traumatic event, are observed in approximately 10% of diaphragmatic injuries.¹ In this study, we present a case of delayed TDH presenting with intestinal obstruction or strangulation to emphasize precise physical examination, interpretation of radiographic images, and accurate pre-operative diagnosis.

A 54-year-old man presented to the surgical emergency department, complaining of cramped abdominal pain, nausea, vomiting (non-bloody), and abdominal distention for 3 days. He had no gas passing or bowel movement in the past 24 hours. He had a car accident 15 years ago, in which laparotomy and splenectomy were performed, due to internal bleeding and splenic laceration. In addition, he sustained a penetrating trauma to the right side of his chest and a thoracotomy tube was inserted. His hospital course was uneventful, and he was discharged after 7 days. On arrival, his vital signs were: Pulse rate: 110/min; respiratory rate: 35/min; blood pressure: 140/90 mm Hg; Temperature: 37.8°C. He had a distended and generally tender abdomen with no rebound tenderness. A 2.5 cm linear scar was observed on the right side of his chest, due to the old penetrating laceration. Bowel sounds were loud and highly frequent. Rectal examination revealed an empty rectum, and other physical examinations were normal. Radiograph imaging (flat and upright of abdomen, and chest x-ray [CXR]), revealed generalized small and large bowel distention, and for intestinal obstruction (**Figure 1**). He was taken to the operating room and with the impression of intestinal obstruction caused by adhesion band, laparotomy was performed. A 3 x 3 cm defect was found in the diaphragm and the jejunum had strangulated in it. Fortunately, the bowel was not gangrenous, and after its release, the diaphragm was repaired. His condition

progressively improved, and he was discharged after 5 days.

The presented case, is a classic example of a patient presenting with intestinal obstruction, caused by strangulation. He had nausea, obstipation, and the radiological evaluations were also in favor of an intestinal obstruction. The most common cause of post operation (post op) intestinal obstruction is the adhesion band.² Therefore, the most probable diagnosis was the adhesion band. However, in our case, the cause was a delayed TDH or chronic diaphragmatic hernia. This is a common mistake, also observed in other institutions. In fact, delayed TDH are observed in approximately 10% of diaphragmatic injuries.¹ Due to coexisting injuries and the silent nature of diaphragmatic injuries, the diagnosis is easily missed or difficult. In a study performed by Ramos et al,³ a retrospective study to identify pitfalls in the diagnosis and treatment of traumatic diaphragmatic injuries in children was performed. The authors evaluated 15 cases of traumatic diaphragmatic rupture. Associated injuries, included, liver lacerations (47%), pelvic fractures (47%), major vessels tear (40%), bowel perforations (33%), long bone fractures (20%), renal lacerations (20%), splenic lacerations (13%), and closed head injuries (13%).³ They concluded that, TDH are usually associated with serious injuries in children, and it is important to combine a high index of suspicion with radiological diagnostic tests in patients at risk.³ Our patient was a victim of a car accident. He was brought



Figure 1 - Abdominal x-ray (flat x-ray) of our 54-year-old patient. The x-ray was taken with the patient in the supine position. A gas distended bowel is present, both in the large and small bowel, however, small bowel distention is more prominently observed.

Clinical Notes

to the emergency department in a state of shock and with multiple injuries. Due to splenic laceration and internal bleeding, the diaphragmatic laceration was missed. Therefore, palpation and visualization of both diaphragms at laparotomy are extremely important in detecting these injuries when they are not suspected preoperatively. A diaphragmatic hernia, should be suspected in all blunt abdominal trauma patients. In patients with penetrating trauma to the abdominothoracic area, TDH should be suspected on the basis of an unusual chest radiograph, especially in the trauma victim with multiple injuries.⁴ Chest x-ray, is the initial method of evaluation of patients suspected of having diaphragmatic hernia. If the diagnosis is vague, then the thorax and upper abdominal CT, and upper gastrointestinal contrast studies would be useful.³ Forni et al,⁵ performed a 19 year retrospective review to evaluate diaphragmatic hernias due to blunt thoracoabdominal trauma in a series of 50 patients. They observed that, all their patients with chronic hernias had suggestive or suspicious abnormalities on chest roentgenograms; however, appropriate upper gastrointestinal tract and barium enema studies were of the utmost importance for the correct diagnosis.⁵ Nursal et al,¹ observed that chest radiography is diagnostic in only 34.6% (n = 9) of their patients. Unfortunately, in our patient, 15 years before his current problem, his CXR was not completely examined, and the diaphragmatic rupture was easily missed. Even in his current admission, since he had a classic and simple presentation of intestinal obstruction, his CXR was not thoroughly evaluated (**Figure 2**). As it has been marked on the CXR with

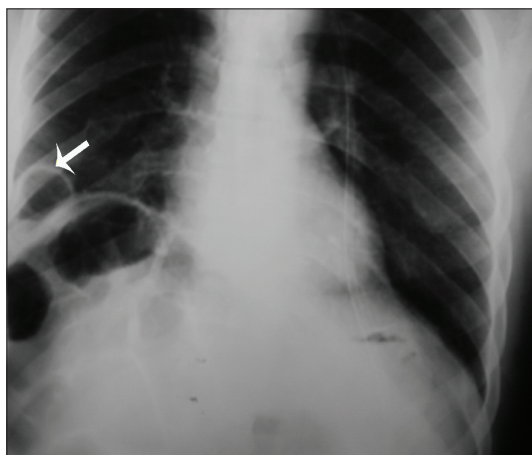


Figure 2 - Chest x-ray with the arrow showing the herniated bowel through the defect in the right diaphragm.

an arrow, an air fluid bubble, which corresponds to a portion of the small bowel, is noted on the right side of the chest and above the diaphragm (**Figure 2**). Although this finding would not have changed the operation plan, and laparotomy was inevitable (due to the strangulated bowel), however, having the most accurate pre-operation diagnosis is always important and vital. Surgeons, particularly residents of surgery, should never underestimate any patient, even if the patient is presenting with a complete scenario of a simple diagnosis.

Prompt surgical repair, is the treatment of choice in all TDH.¹ The surgical approach to TDH should be individualized.⁴ Acute left-sided injuries are best approached through the abdomen, although Hacıbrahimoglu et al,⁴ preferred the chest approach, adding laparotomy when necessary. Acute right-sided injuries and the chronic injuries, should be approached through the chest.⁴ However, when strangulation occurs, laparotomy should be the initial approach. In right-sided injuries, often dual incisions (laparotomy and thoracotomy) for diagnosis and treatment are required.⁵ Forni et al,⁵ observed that reduction of herniated viscera and the repair of a diaphragmatic defect was generally made through a laparotomy in acute hernias, whereas thoracotomy is the preferred approach in delayed instances.

In conclusion, a high index of suspicion, careful physical examination, and interpretation of radiographic images are essential for the diagnosis of traumatic diaphragmatic hernias.

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