



Bowel obstruction due to diaphragmatic injury after penetrating thoracic trauma

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ABSTRACT

Diaphragmatic injuries due to penetrating traumas to the thorax progress insidiously. Proper diagnosis might only be performed after months. Delayed diagnosis increases morbidity and mortality. Herein, we present a case of diaphragm injury due to penetrating thoracic trauma that was diagnosed 2 years later. The case was referred to emergency service with bowel obstruction symptoms and after the examinations, first laparotomy and then thoracotomy were performed. The trace of the injury tract should be evaluated in all penetrating thoracic traumas and diaphragmatic injury should be taken into consideration. It is important to keep in mind that thoracic symptoms could be obscured and, if needed, further evaluation and surgical exploration should be performed. In the absence of early symptoms, failure to recognize diaphragmatic injuries can result in mortality.

Key Words: Diaphragm, injury, bowel obstruction

INTRODUCTION

A diaphragmatic injury may rarely accompany penetrating wounds (1, 2). They cannot be diagnosed at earlier stages due to more severe symptoms related to other organ injuries (2-4). The emergence of symptoms in undiagnosed patients may take months and delay in diagnosis is an important factor that increases both morbidity and mortality (3, 5). Herein, we present a case of diaphragmatic injury due to penetrating thoracic trauma that was diagnosed 2 years later, with herniation of the transverse colon and bowel obstruction. The patient underwent laparotomy followed by thoracotomy with reposition of the colon and primary repair of the diaphragm.

CASE PRESENTATION

A 32-year-old male patient was admitted to the emergency ward with diffuse abdominal distension and pain. The patient's history revealed a penetrating stab wound to the left thorax about two years ago and tube thoracostomy. He did not have any bowel movements (gas-stool) for the past four days. On physical examination, the abdomen was severely distended and there was diffuse abdominal tenderness, guarding and rebound tenderness. On rectal examination, the rectum was empty. The white blood cell count was 23400/ μ L. Plain abdominal X-ray showed air-fluid levels and elevation of the left diaphragm (Figure 1). In addition, abdominal organs were displaced into the thoracic cavity.

A laparotomy was performed due to abdominal distension, tenderness and signs of intestinal obstruction. An approximately 5 cm traumatic defect was detected in the anteromedial portion of the diaphragmatic dome. A portion of the transverse colon and omentum had herniated into the thorax through this defect. The adhesions were released and replacement of the colon and omentum into the abdominal cavity were attempted, however the attempts failed due to dense intrathoracic adhesions. The abdomen was closed and the chest was accessed by a left posterolateral thoracotomy incision through the 7th intercostal space. On exploration, it was observed that the colon and omentum were adherent to the pericardial adipose tissue and lung parenchyma. The adhesions were freed with blunt and sharp dissection and the abdominal organs replaced below the diaphragm. The approximately 5 cm defect was repaired primarily with polypropylene no: 1, without using any prosthetic material. The patient was discharged on postoperative day 5, without any complications (Figure 2).

DISCUSSION

Diaphragmatic rupture due to penetrating trauma is more frequently seen in the young male population, and is associated more frequently with exposure to trauma (1, 5). In our country, stab injuries are the most common cause of diaphragmatic injuries (1, 6). In penetrating injuries to the thorax below the level of the fifth intercostal space, a diaphragmatic injury should be kept in mind and the required investigations should be completed.

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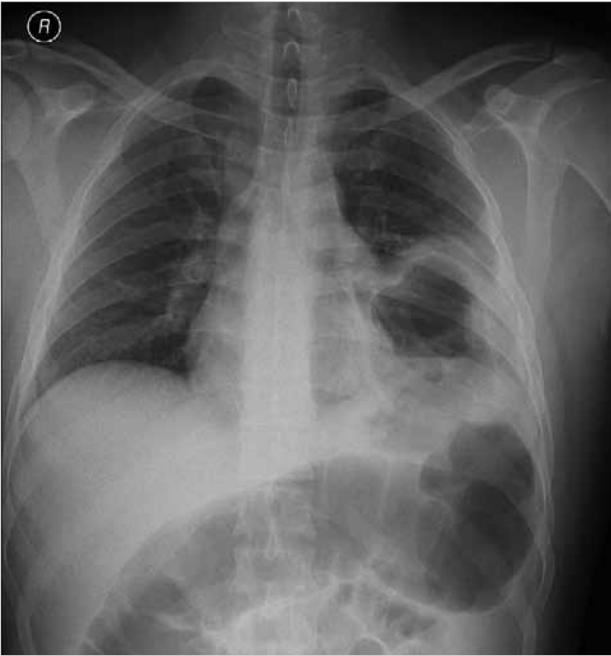


Figure 1. Preoperative direct X-ray



Figure 2. Postoperative direct X-ray

Isolated diaphragmatic injuries can often be asymptomatic. Radiological diagnosis is often not possible (2, 3). These patients can be diagnosed by progressive abdominal organ herniation and the consequent symptoms. Reber et al. (3) reported the emergence of clinical symptoms to range between 20 days and 28 years. In the meta-analysis containing 980 cases from 20 studies, Shah et al. (2) stated that only 43.5% of diaphragmatic ruptures were preoperatively diagnosed, 41.4% were detected intraoperatively, while 14.6% was un-diagnosed. In patients with suspected diaphragmatic injury and cannot be diagnosed by radiological examinations, a definitive diagnosis should be made by either laparoscopic or thoracoscopic approach. Delay in diagnosis

increases both morbidity and mortality. In their series of 56 cases, Göksoy et al. (7) reported that there are 3 stages in blunt injury depending on the time of diagnosis; 1st Stage: Acute initial period; 2nd Stage: Latent or interval; 3rd Stage: Chronic-obstructive period. Intrathoracic organs cause adhesions in the 3rd stage.

In patients with early stage diaphragmatic injury, the most common form of surgical approach is laparotomy due to the possibility of concomitant intra-abdominal trauma and is the most appropriate approach for the treatment of intra-abdominal injuries (1, 3, 7-9). Güloğlu et al. (9) reported that preoperative radiography was diagnostic in 31% of the 67 patients during the acute phase of the disease. The diagnosis of diaphragmatic injury can be made during an operation performed for accompanying injuries. However, in patients with delayed suspicion or diagnosis of diaphragmatic injury, exploration by thoracotomy is recommended due to possible adhesions between the herniated organs and pleura and intrathoracic organs (1, 3). In the case presented here, since the patient presented with intestinal obstruction and severe abdominal complaints which emerged acutely, a laparotomy was considered as the appropriate method for an emergency surgical procedure. Nevertheless, a thoracotomy was inevitable after failing to replace the transverse colon back into the abdomen due to intra-thoracic adhesions that formed during the delay period.

CONCLUSION

When assessing patients with a history of penetrating wounds to the thorax in terms of abdominal pathologies, trans-thoracic abdominal injuries or pathologies related to possible diaphragmatic injury without concomitant abdominal organ injuries should be considered. Type of surgery should be decided according to the factors causing this pathological presentation.

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