Traumatic hepatothorax

Dear Editor,
A 37-year-old man presented to the Emergency Department complaining of worsening right “rib pain” for 4 months. The patient had sustained right-sided rib fractures 2 years prior to a high-velocity motor vehicle collision. The physical examination was significant only for mild tenderness over the right lateral thorax without any obvious swelling or deformity. The patient's vital signs in the Emergency Department included a temperature of 97.2, heart rate of 68, blood pressure of 129/76, respiratory rate of 20, and oxygen saturation of 99% on room air. Chest radiography was shown in Figure 1.

Computed tomography (CT) scan confirmed the mass to be a liver segment herniated through the right diaphragm [Figure 2].

The patient was evaluated by the trauma surgery service, which referred the patient to their outpatient clinic for operative planning.

Diaphragmatic rupture secondary to trauma is potentially fatal and occurs in 0.8%–5% of patients who suffer thoracoabdominal trauma. The majority of hernias that result from diaphragmatic injury are left-sided, likely secondary to the relative protection of the right diaphragm by the liver.

Initial diagnosis is often missed in the acute setting due to the presence of severe coexisting injuries and the asymptomatic nature of diaphragmatic injuries. Up to 30% of diaphragmatic hernias present late.

There are three phases used to describe the presentation of diaphragmatic rupture: acute, latent, and obstructive. The acute phase occurs during the recovery time from the initial injury. The
Latent phase refers to an asymptomatic period, where hernias are discovered incidentally on radiologic imaging performed for other reasons. Patients presenting during the obstructive phase are symptomatic often from gastrointestinal (GI) obstruction or perforation, or from cardiovascular compromise secondary to worsening herniation of abdominal contents into the thorax.[4]

The pathognomonic finding for diaphragmatic injury on plain chest radiograph is visualization of a hollow viscus above the diaphragm, with or without an area of constriction at the level of the diaphragm.[4]

CT is the preferred imaging study for the evaluation of patients with severe blunt abdominal trauma. Findings on CT consistent with diaphragmatic rupture include direct visualization of the defect; segmental nonvisualization of the diaphragm; herniation of viscera; constriction of a herniated viscus, or a “collar sign;” and active extravasation of contrast at the level of the diaphragm.[4]

Thoracotomy is the preferred approach for repair of large posttraumatic hernias rather than a transabdominal approach to allow for visualization and lysis of adhesions to thoracic structures.[4] A transthoracic approach also avoids potential dense intra-abdominal adhesions from prior trauma or surgery.[4]

Mortality from diaphragmatic injury is dependent on the severity of the associated injuries. Mortality rates, therefore, range from 18% to 40%, depending on whether the initial injury was blunt or penetrating.[5] In the latent or obstructive phases, the presence of GI obstruction, perforation, or ischemia significantly increases postoperative morbidity and mortality. It is, therefore, important to maintain a high level of suspicion for diaphragmatic injuries.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES
1. Rashid F, Chakrabarty MM, Singh R, Iftikhar SY. A review on delayed presentation of diaphragmatic rupture. World J Emerg Surg 2009;4:32.
2. Pappas-Gogos G, Karfis EA, Kakadellis J, Tsimiroyannis EC. Intrathoracic cancer of the splenic flexure. Hernia 2007;11:257-9.
3. Grimes OF. Traumatic injuries of the diaphragm. Diaphragmatic hernia. Am J Surg 1974;128:175-81.
4. Schuster KM, Davis KA. Management of specific injuries: Diaphragm. In: Mattox KL, Moore EE, Feliciano DV, editors. Trauma. New York: McGraw-Hill Companies, Inc.; 2013. p. 529-38.
5. Hanna WC, Ferri LE, Fata P, Razek T, Mulder DS. The current status of traumatic diaphragmatic injury: Lessons learned from 105 patients over 13 years. Ann Thorac Surg 1995;60:1444-9.