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Visual Diagnosis in Emergency Medicine

BEWARE OF THE BULGING LIVER: A RARE CASE OF TRAUMATIC LIVER HERNIATION

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INTRODUCTION

Although liver injuries are quite common after blunt trauma, traumatic herniation of the liver through an intercostal defect and the muscles of the anterolateral abdominal wall following blunt abdominal trauma is extremely rare. The ribcage encloses the majority of the right liver and most of the left liver, partially protecting it from external trauma. However, when high-energy mechanisms are involved, the rigid ribs may not provide sufficient protection. The liver is relatively immobile due to the coronary and triangular ligaments, making its displacement and herniation highly unlikely. We present a case of traumatic abdominal intercostal herniation of the liver after a high-speed motor vehicle accident and its management.

Case Report

A 65-year-old woman presented to our shock and trauma unit after a high-speed motor vehicle accident as a restrained passenger in which she sustained considerable blunt trauma to her upper abdomen and chest. Upon arrival she was hemodynamically stable and spontaneously breathing with bilateral clear breath sounds noted. Physical examination revealed a right flank hematoma and a distinct seat belt sign on her right chest and mid-abdomen. Localized tenderness on the right flank and right upper quadrant with no signs of peritonitis were noted as well as a nonreducible protruding bulge in the right upper quadrant. Focused sonographic assessment was negative, and a chest radiograph showed no signs of pneumohemothorax or elevation of the right hemidiaphragm. Abdominal computed tomography revealed displaced lateral fractures of the right eighth and ninth ribs, with rupture of the intercostal lateral abdominal musculature and the anterior aspect of the right latissimus dorsi. There was protrusion of the anterior lateral segments of the right hepatic lobe through an abdominal wall defect, between the rib fractures (Figure 1). The slight hypodensity of the liver parenchyma adjacent to the fractured ribs was thought to represent a mild contusion. After initial assessment, the patient was taken to the operating room for an exploratory laparotomy to rule out any other intra-abdominal injuries caused by the high-energy mechanism that caused the disruption of the abdominal wall. The patient was placed in a supine position with a slight tilt to the left. A small amount of hemoperitoneum was found, with the right lateral segments of the liver herniating through an intercostal opening formed between the

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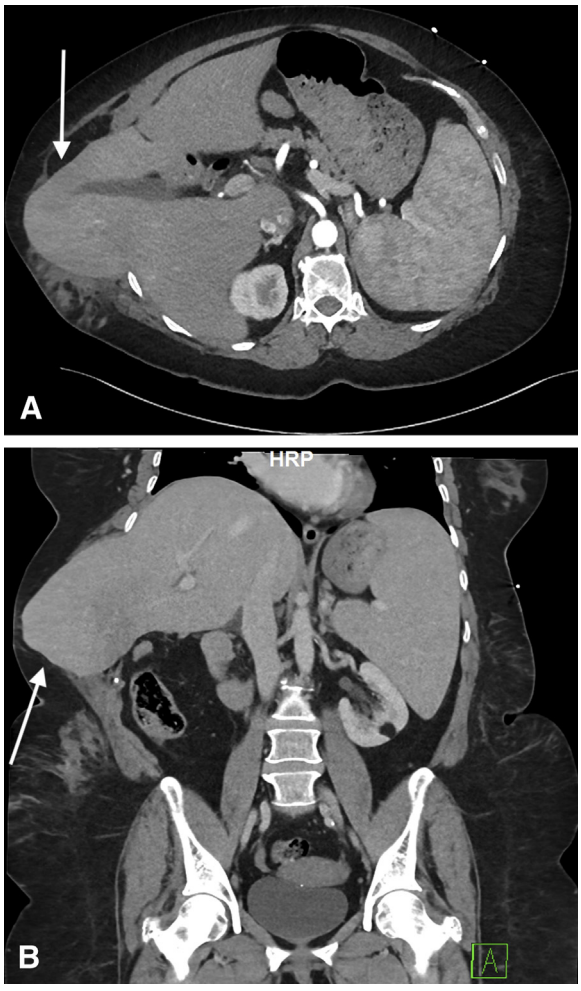

Figure 1. (A) Axial and (B) coronal reconstructions of an abdominal computed tomography scan showing fractures of the eighth and ninth right ribs and rupture of the lateral chest wall musculature. The right hepatic lobe of the liver is seen protruding through this abdominal wall defect (arrows).

fractured eighth and ninth ribs. Although there was complete disruption of the corresponding intercostal musculature, the diaphragm was found to be completely intact. There was no evidence of active bleeding or bile leak from the liver, with only a superficial laceration noted on the right lateral sector. Additional inspection of the abdomen revealed only 2 mild hematomas at the mesentery of the small bowel with no further injuries. Primary repair of the right abdominal intercostal herniation was performed using interpositional sutures, and no mesh was placed. The patient was extubated the next day, had an uneventful recovery, and was discharged 4 days later.

The patient was seen in follow-up clinic visits at both 1 and 12 months postsurgery, with no recurrence of the hernia.

DISCUSSION

The liver is the most commonly injured solid organ in patients with blunt abdominal trauma. When dealing with blunt abdominal trauma to the liver, emergent laparotomy is preserved only for patients who are hemodynamically unstable or who have diffuse peritonitis (1). However, this recommendation obviously disregards the rare case in which traumatic herniation of the liver occurs. In this scenario, nonoperative management is strongly discouraged, because rapid operative reduction of the herniated liver segment is key to prevent parenchymal ischemia and restore abdominal wall integrity and functionality. We eschew nonoperative management because it may lead to delayed complications, such as strangulation of abdominal viscera or a segment of the liver (2). The mechanism of such injury may be a shearing injury to the liver at its fixed attachments or a direct blow to the abdomen fracturing the lower abdominal ribs while simultaneously inducing a sudden increase in intra-abdominal pressure (3). When an abdominal intercostal hernia is suspected, prompt exploration is recommended for controlled reduction of the liver back into the abdominal cavity and for ruling out other associated intra-abdominal injuries. The emergency physician must be aware that fractures of the abdominal ribs may be associated with hollow viscus injury, especially when the mechanism of injury involves high-velocity acceleration/deceleration forces.

CONCLUSION

We present a rare case of abdominal intercostal herniation of the liver secondary to displaced rib fractures and concomitant disruption of intercostal musculature sustained by blunt abdominal trauma. This rare traumatic injury and its management are hereby discussed.

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