

An 18-year-old man is brought to the emergency department for possible injury during football practice. While running for a touchdown, the patient was tackled from the front and fell to the ground with another player landing on top of him. Immediately after he started to experience abdominal discomfort, nausea, and left-sided chest and shoulder pain. The patient has no prior medical issues other than a mild sore throat and fever several weeks ago. He does not use tobacco, alcohol, or illicit drugs. Blood pressure is 106/67 mm Hg, pulse is 107/min, and respirations are 24/min. The patient is diaphoretic and appears anxious. Heart sounds are normal without murmur. Bilateral breath sounds are clear and equal. He has left chest wall tenderness. The abdomen is mildly distended and tender with decreased bowel sounds. Range of movement of the left shoulder is full and not painful. Further evaluation of this patient is most likely to reveal which of the following?

- ☐ A. Descending aorta tear
- ☐ B. Pericardial effusion
- ☐ C. Pneumothorax
- ☐ D. Small bowel perforation
- ☐ E. Splenic laceration

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- ☐ A. Descending aorta tear [3%]
- ☐ B. Pericardial effusion [1%]
- ☐ C. Pneumothorax [1%]
- ☐ D. Small bowel perforation [3%]
- ☒ E. Splenic laceration [93%]

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Explanation:

User Id: [REDACTED]

This patient's presentation is concerning for possible **blunt abdominal trauma (BAT)** (abdominal tenderness) and blunt thoracic trauma (BTT) (chest wall tenderness) following a football injury. Tachycardia (or hypotension) is concerning for hemorrhage due to a solid organ or vascular injury. The most common intra-abdominal organ injuries due to BAT are hepatic and **splenic lacerations**.

Splenic injury is most likely in the setting of **abdominal pain, tachycardia, and left chest wall and shoulder pain** without evidence of abnormalities of the shoulder (likely **referred pain** due to phrenic nerve irritation from splenic hemorrhage). The next step in evaluation should include a focused assessment with sonography for trauma (FAST) examination to identify signs of hemorrhage.

(Choice A) BAT infrequently leads to vascular injury of the mesenteric or pelvic vessels (more likely with pelvic fractures) whereas BTT is more commonly associated with aortic injury. However, the most common mechanisms resulting in significant aortic injury are **rapid deceleration injuries** such as motor vehicle collisions at speeds >50 km/hr (30

due to BAT are hepatic and **splenic lacerations**.

Splenic injury is most likely in the setting of **abdominal pain, tachycardia, and left chest wall and shoulder pain** without evidence of abnormalities of the shoulder (likely **referred pain** due to phrenic nerve irritation from splenic hemorrhage). The next step in evaluation should include a focused assessment with sonography for trauma (FAST) examination to identify signs of hemorrhage.

(Choice A) BAT infrequently leads to vascular injury of the mesenteric or pelvic vessels (more likely with pelvic fractures) whereas BTT is more commonly associated with aortic injury. However, the most common mechanisms resulting in significant aortic injury are rapid deceleration injuries such as motor vehicle collisions at speeds >50 km/hr (30 mph), falls from >3 m (10 ft), or severe crush injuries. Moreover, patients with aortic trauma frequently have significant comorbid injuries such as fractures, neurological deficits, cardiac murmurs, and upper extremity hypotension.

(Choice B) A pericardial effusion causing cardiac tamponade is an important consideration in any patient with hemodynamic changes after BAT or BTT. Signs of effusion and tamponade include distant heart sounds, elevated jugular venous pressure, tachycardia, and hypotension.

(Choice C) Pneumothorax is a frequent complication from BTT; however, patients usually present with unequal breath sounds on the affected side in addition to other signs, such as tachypnea and chest pain.

(Choice D) Small bowel perforation can occur due to mesenteric vascular injury with subsequent ischemia and necrosis. However, perforation due to blunt trauma more commonly presents several days after the initial event with fevers, hemodynamic instability, and diminished bowel sounds. Acute presentations are more common in penetrating trauma.

Educational objective:

Tachycardia or hypotension after blunt abdominal or thoracic trauma is concerning for hemorrhage from either a solid organ or vascular injury. Signs of left chest and abdominal trauma in such patients are suggestive of splenic lacerations.

References:

1. **Blunt abdominal injuries.**
2. **An experience with blunt abdominal trauma: evaluation, management and outcome.**

Media Exhibit

aceration

