

Acting fast on late-onset abdominal and back pain

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Abstract

Blunt abdominal trauma can cause insidious liver injury and laceration. In particular, a subcapsular hepatic hematoma may result from bleeding in the parenchyma that is contained by the liver capsule. In some circumstances, a hepatic laceration may result in delayed blood collection. A growing body of evidence has also reported the occurrence of liver hematoma associated with abdominal trauma. We describe a 13-year-old female with a late-onset subcapsular hepatic hematoma after abdominal injury. She presented with worsening abdominal and lower back pain. Her management was conservative with fluid resuscitation and in-hospital monitoring. Our case highlights the importance of close follow-up and diagnostic imaging following blunt abdominal trauma.

A 13-year-old female presented to the community physician's office with abdominal and back pain. Her past medical history was relevant for a head-on motor vehicle collision at approximately 60km/hr four days prior. She was a passenger, seated in the rear with a seatbelt. Airbags were deployed and there were no fatalities. Following the collision, she had generalized abdominal and back pain, but no other symptoms. She was taken to hospital by ambulance. Her vitals were normal, and Glasgow Coma Scale was 15. Upon examination 3 days following the collision, there were no overt signs of trauma, bruising, or injury. Her abdomen was soft, but mildly tender. The rest of her examination was normal. Focused assessment with sonography in trauma (FAST) scan was negative and cervical spine x-rays ruled out any fractures or displacements. No other radiological imaging was performed.

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She was provided analgesic medications and instructed to follow-up with her primary care provider.

At presentation, she complained of worsening abdominal and lower back pain. She was afebrile, tachycardic (heart rate 103 beats per minute) with a stable blood pressure (90/60 mmHg). Her respiratory rate was 20 breaths per minute with 100% oxygen saturation in room air. Her abdomen was not distended, generally tender with peritoneal signs and diminished bowel sounds. She appeared uncomfortable and was transferred to the emergency department.

Her initial hemoglobin was 64 g/L and she received a transfusion of two units of red blood cells. An abdominal computerized tomography (CT) scan revealed a non-expanding, subcapsular hepatic hematoma measuring 12x7x13 cm (Figure 1). It was classified as a grade 3 liver injury as more than 50% of the liver capsule surface area was involved. She was admitted for observation and serial abdominal examinations. Her pain improved and she remained clinically stable throughout her five-day hospital admission. Her hemoglobin at discharge was 92 g/L.

Case diagnosis: subcapsular hepatic hematoma

A subcapsular hepatic hematoma is defined as bleeding from vessels within the liver parenchyma that is locally contained by

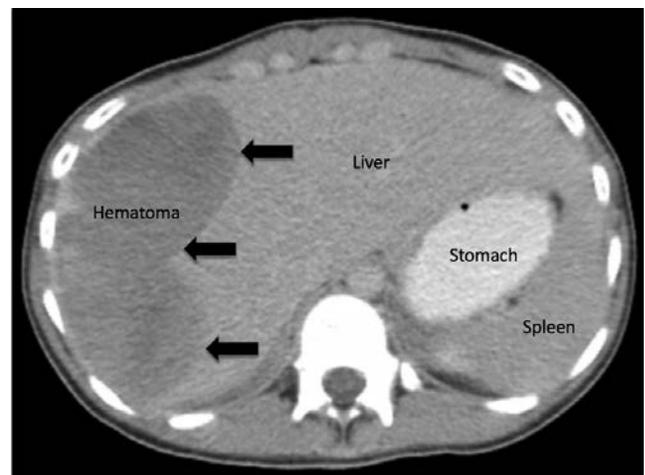


Figure 1. Abdomen computed tomography with contrast demonstrating Grade III liver injury. Note: Right subcapsular parenchymal hematoma approaching 50% of surface area without extravasation.

Table 1. Liver Injury Scale

Grade	Injury Type	Injury Description
I	Hematoma	Subcapsular, <10% surface area
	Laceration	Capsular tear, <1cm
		Parenchymal depth
II	Hematoma	Subcapsular, 10%-50% surface area Intraparenchymal, <10 cm in diameter
	Laceration	Capsular tear, 1-3cm parenchymal depth, <10 cm in length
III	Hematoma	Subcapsular, >50% surface area of ruptured subcapsular or parenchymal hematoma; intraparenchymal hematoma > 10cm or expanding
	Laceration	>3 cm parenchymal depth
IV	Laceration	Parenchymal disruption involving 25% to 75% hepatic lobe or 1-3 Couinaud's segments
V	Laceration	Parenchymal disruption involving >75% of hepatic lobe or >3 Couinaud's segments within a single lobe
	Vascular	Juxtahepatic venous injuries; ie, retrohepatic vena cava/central major hepatic veins
VI	Vascular	Hepatic avulsion

Note: Adapted from Drexel et al. 2017.

the liver capsule.¹ The patient experiences abdominal pain and may have unstable hypotension and tachycardia suspicious for intraabdominal hemorrhage or shock. Most hematomas occur at the time of trauma. However, in rare cases there may be a delayed collection of blood within the liver from a continuous bleeding hepatic laceration. This may present as worsening right-upper-quadrant pain over several days with systemic signs of anemia or shock, despite negative initial investigations.¹ Due to the high vascularity of the liver, unmonitored hemorrhage can result in severe anemia, cardiac dysrhythmia, shock, and sudden death.²

General trauma-induced liver injury, known as liver laceration, represents some of the most common abdominal injuries. Small lacerations or intrahepatic hematomas are usually able to be managed without the use of a laparotomy.³ This has shown to be common predominantly where rapid evaluation and potential treatment are available. Prolonged delay of evaluation and diagnosis puts the patient at higher risk of laparotomy. Outcomes in these patients have improved through direct suture ligation of bleeding parenchymal vessels, advent of damage control, and total vascular isolation with repair to venous injuries.⁴

Pliable ribs and caudally extended upper abdominal organs in pediatric anatomy contributes to a greater number of splenic and hepatic injuries from blunt abdominal trauma in children, as compared to adults.² A FAST scan is conducted early in all blunt trauma cases to assess intraperitoneal hemorrhage requiring immediate surgical exploration. The sensitivity of FAST scans for injuries requiring surgical intervention or blood transfusion is 87.5%.⁵ In a clinically stable patient without major hemorrhage, contrast-enhanced CT is the primary modality to assess solid organ injury, including liver lacerations, hematomas, and hepatic vessel injuries.³ The degree of liver trauma is graded based on international trauma care guidelines (Table 1). The liver injury grading is used to standardize the reporting of the degree of injury. However, it is not used as a guide for management.⁶

Subcapsular hepatic hematomas are largely managed non-operatively with fluid resuscitation and close monitoring.⁷ Admission under general surgery service is recommended. Surgical management is based on hemodynamic status or worsening progress.⁶⁻⁸ For general practitioners, careful re-examination of

abdominal pain and transfer to a surgical centre for abdominal CT should be considered, especially if the patient presents with abdominal pain for a week or longer following blunt abdominal trauma. Positive FAST may determine if intraperitoneal hemorrhage is present, which might require surgical management.

Clinical pearls

- Following blunt abdominal trauma, symptomatic patients require close follow-up.
- Consider contrast-enhanced CT scanning to diagnose hepatic laceration when suspicion is high or symptoms persist.
- The vast majority of subcapsular hepatic hematomas can be managed conservatively but may require admission for observation.

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