

Biliary peritonitis from isolated gallbladder perforation on blunt abdominal trauma

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ABSTRACT

Isolated gallbladder perforation on blunt abdominal injury is a rare occurrence. Clinical presentation often involves an insidious onset of symptoms, with features of peritonitis presenting one week after trauma. Here we present a 17-year old patient with generalized peritonitis on traumatic blunt gallbladder perforation. He underwent exploratory laparotomy with cholecystectomy and abdominal washout. An uneventful recovery was achieved. A substantially better prognosis is gained upon prompt diagnosis and management of gallbladder perforation following blunt abdominal trauma.

Keywords: Gallbladder; Biliary peritonitis; cholecystectomy

BACKGROUND

The gallbladder is a 7 to 10 cm long intra-abdominal, pear-shaped viscera which can contain up to 50 ccs of bile. It has three main parts - the fundus, the body, and the neck. The fundus is often in close relationship with the upper part of the duodenum (1). It is anatomically related and adheres to the lower surface of the liver, which serves as a shelter in blunt injuries (1,2). Blunt abdominal trauma most commonly causes solid organ injuries. However, hollow organs may suffer as well. Isolated injury on the gallbladder is uncommon in blunt abdominal trauma, resulting in unspecific clinical features and poses enormous challenges in making the diagnosis (3). This type of injury was known as early as 1388, whereby it was identified in a postmortem body in Guy's Museum in London (4).

Patients with gallbladder perforation often present with an insidious onset of wispy abdominal symptoms over 5 to 7 days. Some patients may have episodes of diarrhea in the early course of the disease. In cases where a prompt intervention is not addressed, the disease progresses to typical peritonitis. Imaging (abdominal ultrasound and CT scan) may reveal evidence of a wall defect or intramural hematoma, although these features are often missed (2,3,5). Upon diagnosis of gallbladder perforation, cholecystectomy remains the standardized

management (2). The incidence of isolated gallbladder injury in blunt and penetrating abdominal trauma range between 1.9-2.1% (2,3,4,6,7).

To the best of our knowledge, there is no similar case reported in Rwanda. Therefore, we are publishing this case to raise local awareness upon the occurrence of this injury to have an index of suspicion when blunt, and penetrating abdominal injuries occur.

CASE REPORT

A 17-year-old male patient, of poor socio-economic status, presented to the emergency department of a tertiary referral hospital in Kigali with diffuse abdominal pain, progressive abdominal distention, and a fever for ten days. His history indicated trauma in the form of a fall off his pedal bike in the prone position. He has been passing gas but no stool for the previous two days, and he also reported discomfort in his chest. After the injury, he had an insidious onset of the disease and delayed to consult as he thought he would improve over time. The patient presented at the nearest health center on day-9 after the injury. He was promptly transferred to a district hospital where he was diagnosed with generalized peritonitis. He was then referred to the University Teaching Hospital of Kigali (CHUK) for further management.

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The initial assessment was done in accordance with Advanced Trauma Life Support (ATLS) principles. The primary survey life-threatening injuries. Upon systemic examination, the general status was altered by moderate abdominal pain. He was fully alert. His vital signs were as follows: SaO₂: 88% on room air; Blood Pressure: 121/77 mmHg & Heart rate: 104 bpm.

Lungs were clear to auscultation. The abdomen was distended, diffusely tender, with rebound tenderness. The digital rectal exam revealed a tender recto-vesical pouch. Focused abdominal sonography for trauma (FAST) was positive in Morrison's pouch and the pelvis. The rest of his physical examination was unremarkable.

The initial impression was peritonitis on blunt abdominal trauma with possible hollow viscus perforation or solid organ injury. The white blood cell count was $7.29 \times 10^9/L$ (neutrophil: 75.6%), hemoglobin was 18.6g/dl (Hematocrit: 53), urea at: 5.5mmol/L and creatinine at: 41umol/L. An upright chest x-ray showed normal findings (no free air under the diaphragm). The patient was therefore prepared for explorative laparotomy.

In the operative room, an extended midline incision was made; on entering the abdomen, two liters of bilious inflammatory fluid was aspirated. On exploration, the liver, stomach, spleen, small intestine, and large intestine were all normal. We found a 2 cm perforation at the fundus of the gallbladder with bile leaking through it. Cholecystectomy was performed successfully and no biopsy taken. The abdomen was washed with warm normal saline. The postoperative course was uneventful, and the patient was discharged on postoperative day-4, and required to consult OPD for a follow-up after one week.

DISCUSSION

Isolated gallbladder perforation is very rare. This is the first case to be reported in Rwanda. This patient presented for consultation at day nine post-trauma, similar to another report where patients often present after 5-7 days (3, 7). The patient's poor socio-economic status or the level of understanding amongst his family may also have influenced the delay in presentation. It remains rare for the gallbladder to be perforated by trauma and, when it occurs, often a penetrating injury is involved. Hence blunt injury, as a cause, is doubtful and can present as contusion, avulsion, and laceration, with the latter being the most common (6,7). Losanoff and Kjossev proposed a gallbladder injury classification (Table 1). The current case reports the most common type which is immediate gallbladder rupture at the scene of injury (8).

Upon presentation, this patient had features of peritonitis, similar to other reports. Cholecystectomy was carried out as the standardized treatment option, and a good outcome was achieved (2,7). With prompt diagnosis and without massive contamination of the peritoneal cavity, laparoscopic cholecystectomy is an alternative management option (6). Being at either end of life is not a protective factor as this type of injury was even reported in preschoolers when a blunt injury is involved (7). Trauma that is preceded by a large meal or alcohol

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consumption is a potential risk factor for perforated gallbladder in blunt injuries. The latter causes spasm at the sphincter of Oddi and indirectly distention of the gallbladder. A thin-walled gallbladder may also increase the risk for perforation of the gallbladder in blunt injuries (7,9,10). A shearing force may be transmitted to the gallbladder bed in cases of blunt abdominal trauma on cirrhotic and nodular livers, hence increasing the risk of gallbladder injury (11).

Diseased gallbladders may be less likely to be injured compared to healthy ones since they are inflamed and fibrotic (12,13).

Table: Classification of Gallbladder perforation following BAT (8).

Type	Subtypes
1 Contusion	A: with mural hematoma B: with perforation
2 Rupture	
3 Avulsion	A: partial breakup B: detachment from the liver, remain attached to the hepatoduodenal ligament C: Separated from hepatoduodenal ligament D: Separated from liver and hepatoduodenal ligament
4 Cholecystitis	A: Traumatic, Secondary to hemobilia B: Acute acalculous
5 Mucosa Tear with bile leak	

CONCLUSION

Isolated gallbladder injury following blunt abdominal trauma is a very rare entity. However, it does occur in different settings. Delayed diagnosis has previously been noted due to its insidious onset. However, an exhaustive, thorough, sequential clinical examination and adjunction of potential documented risk factors may substantially lead to the diagnosis. Upon diagnosis, an emergent cholecystectomy with peritoneal lavage in septic abdomen results in a good outcome.

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