

## Case Report

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# Do you think of gangrenous gallbladder following blunt trauma abdomen? a rare case report

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## ABSTRACT

Isolated gangrenous gallbladder secondary to blunt trauma abdomen (BTA) is the rarest entity comes with great challenge due to low incidence. Gallbladder injury was reported to be between 1.9%-2.1% of all abdominal trauma, out of it, gall bladder rupture seen in <1%. Till date only one case report has been published. Clinical presentation of gallbladder injury is variable, resulting in a delay in diagnosis and treatment. This case report describes a significant mechanism of blunt force injury resulting in an isolated gangrenous gallbladder as it is a relatively well-protected organ; consequently, its gangrenous following blunt abdominal injury is rare and usually associated with other visceral injuries. Almost all gallbladder injuries following blunt trauma are associated with other significant intra-abdominal injuries and in the setting of acute trauma. We recommend an open procedure to facilitate a detailed exploration to exclude associated injuries. We report a case of a healthy 23years old adult male who sustained isolated gangrenous gallbladder following BTA who sustained injury following fall from riding a two wheeler motor cycle. We recommend an open cholecystectomy procedure to facilitate a detailed exploration to exclude associated injuries and has a good outcome.

**Keywords:** Blunt trauma abdomen, Gangrenous gallbladder, Gallbladder injuries, Cholecystectomy

## INTRODUCTION

Isolated traumatic gallbladder injuries are uncommon and difficult to diagnose.<sup>1</sup> Gallbladder injury usually occurs due to compressive and shearing force, most commonly in motor vehicle injury. Computed tomography is the best known technique for diagnosing gallbladder injury.<sup>2</sup>

The gallbladder is a pear-shaped, fibromuscular sac.<sup>1,2</sup> The low incidence is most likely because of the position of the gallbladder. Lying within the gallbladder fossa on the visceral surface of the right lobe of the liver, shock absorbance courtesy of the liver, damped by the neighbouring omentum and intestine and safeguarded by the rib cage. The mechanism of traumatic injury to the gallbladder varies. In penetrating trauma, projectile and knife injuries preponderate; Alternatively, blunt trauma

has many modalities, including abdominal punches, kicks, falls and road traffic accidents. Its shielding anatomical location likely accounts for the significantly low incidence of isolated traumatic gallbladder injuries following blunt trauma abdomen (BTA). However, if this protective position is breached due to blunt force and produces a gallbladder injury, other serious intra-abdominal injuries are almost always present.<sup>3,4</sup> Associated injuries that most frequently determine patient management and prognosis. Subsequently, the mortality associated with gallbladder injuries is reflective of the mortality resulting from concomitant injuries.<sup>5</sup>

Consequently, gangrenous gallbladder following BTA is rare and is usually associated with other visceral injuries. Isolated gangrenous gallbladder due to blunt abdominal trauma is even rarer. Most literature on the subjects are

case reports because of the rarity of the disease. This report serves to increase clinician awareness of probable risk factors for traumatic gangrenous gallbladder in order to focus diagnostic suspicion and enhance early detection.

## CASE REPORT

A 23-year-old male bike rider was referred from a General Hospital, Haridwar to AIIMS Rishikesh on 13th february 2021 with history of tenderness over right side of abdomen and abrasions on his right hypochondrial region. He developed a progressive pain in abdominal with abdominal discomfort.



**Figure 1: CECT abdomen: gall bladder perforation with grade I pancreatic injury.**



**Figure 2: Intraoperative gangrenous gall bladder.**

On arrival, his airway was patent with B/L air entry present on chest. His pulse was 124/min, BP was 112/72 mm of hg, RR of 20/min with GCS of 15/15. On evaluation FAST was also negative. On secondary survey the positive finding was Abdomen Tenderness with positive rebound tenderness in right hypochondrium.

In view of positive abdominal sign with tachycardia patient sent for contrast enhanced CT scan of abdomen. CT

scan abdomen revealed, gall bladder perforation with grade I pancreatic injury (Figure 1). Later patient was taken for exploration and we found gangrenous gall bladder without any solid organ injury. We also explore other area for non-expanding zone II hematoma and opened lesser sac to rule out other injury (Figure 2). On exploration of lesser sac there is no evidence of pancreatic injury which contradict to CT report. We did dissection of the Calot's triangle and examined common bile duct (CBD) and cystic artery. On examination we found gangrenous gall bladder and thrombosed cystic artery with intact CBD. We did cholecystectomy after ligation of cystic duct which was spared. Peritoneal lavage done and abdomen was closed in layers. Gangrenous gallbladder sent for histopathological examination (Figure 3). Patient was observed in high dependency unit (HDU) for 24 hrs and shifted to ward. Later patient was discharge on satisfactory condition.



**Figure 3: Cholecystectomy specimen sent for histopathology.**

## DISCUSSION

Injury to the gallbladder following blunt abdominal trauma is rare as mentioned above. Isolated injury to the GB is even rarer as it is protected under the rib cage and the liver in which it is embedded.

The majority of GB injuries occur following motor vehicular incidents from road traffic accidents followed by significant falls and direct kicks or blows from sporting activities and fights.<sup>1-7</sup> The underlying mechanism is the shearing acceleration-deceleration force with impacts against the steering wheel or seat belts or the direct blows. The exact mechanism of injury in our patient remains unclear; he was riding a motor cycle that collided with another, direct blow with parts of the motor cycle to the abdomen may be the cause.

Traumatic cholecystitis is caused by cystic duct obstruction by blood clots from liver or gallbladder injury.<sup>9</sup> in this case there is suspicion of cystic artery injury or blunt injury to gall bladder wall because of that gall bladder get

necrosis. Only management remain exploratory laparotomy with cholecystectomy with exploration for associated injuries.

Ultrasonography and CT scans are most usefull tool when we suspect gall bladder injury. Other modalities like Tc99m-HIDA cholecystosintigraphy is more accurate but not feaseable in trauma settings.<sup>9</sup> MRI and endoscopic retrograde cholangiopancreatography are other possible diagnostic modalities in blunt abdominal trauma but are time consuming and not possible in nonresponders.<sup>7</sup> In our case, CT scan was done which is suggestive of gall bladder perforation. Thus, we have to go for laparotomy.

Isolated GB gangrenous due to blunt injuries to the abdomen can occur and may constitute a diagnostic challenge. The clinical presentation is variable and nonspecific, resulting in difficulty in diagnosis as was the case in our patient. Diagnosis of GB gangrene secondary to blunt abdominal injury is mostly incidental at laparotomy for evaluation and treatment of other visceral injuries.

Numerous treatment possibilities have previously been suggested in litreture for the management of a gallbladder injuries like, expectant observation, only drainage, cholecystorrhaphy or cholecystostomy. Among all options cholecystectomy remains the treatment of choice.<sup>2-4,7</sup> Laparoscopic cholecystectomy is advocated to be safe procedure in the diagnosis and treatment of traumatic gallbladder injuries.<sup>3,7</sup> Laparoscopic procedures always remain uncertain in trauma setting for missed injuries thus, in our case, exploratory laparotomy and cholecystectomy were done to rule out other organ injury and uncertainty of the diagnosis. High morbidity and mortality in patients with gallbladder injuries is usually due to associated intraabdominal injuries or in undiagnosed cases.<sup>2</sup> However, no deaths have ever been reported in patients with isolated gallbladder rupture treated surgically.<sup>4</sup>

## CONCLUSION

We conclude that, isolated gall bladder gangrene due to blunt trauma abdomen is extremely rare and that resulting from road traffic injury has not been reported yet. In case of gall bladder perforation finding in CT Scan, we must have high index of suspicion of gall bladder gangrene also which might lead to early diagnosis. Open cholecystectomy is a safe option of treatment and even in resource poor condition. Early diagnosis and operative manegemnt has a good outcome.

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## REFERENCES

1. Soderstrom CA, Maekawa KA, DuPriest Jr RW, Cowley RA. Gallbladder injuries resulting from blunt abdominal trauma: an experience and review. *Annals of surgery*. 1981;193(1):60.
2. Schachter P, Czerniak A, Shemesh E, Avigad I, Lotan G, Wolfstein I. Isolated gallbladder rupture due to blunt abdominal trauma. *HPB Surgery*. 1989;1(4):359-62.
3. De Raet J, Lamote J, Delvaux G. Isolated traumatic gallbladder rupture. *Acta Chirurgica Belgica*. 2010;110(3):370-5.
4. Wiener I, Watson LC, Wolma FJ. Perforation of the gallbladder due to blunt abdominal trauma. *Archives of Surgery*. 1982;117(6):805-7.
5. Bainbridge J, Shaaban H, Kenefick N, Armstrong CP. Delayed presentation of an isolated gallbladder rupture following blunt abdominal trauma: a case report. *Journal of medical case reports*. 2007;1(1):1-3.
6. Ameh EA, Mai A, Adams LM, Dogo PM, Esangbedo AE, Nmadu PT. Blunt traumatic injury of the gallbladder in childhood. *Cent Afr J Med*. 1997;43:272-3.
7. Kohler R, Millin R, Bonner B, Louw A. Laparoscopic treatment of an isolated gallbladder rupture following blunt abdominal trauma in a schoolboy rugby player. *British journal of sports medicine*. 2002;36(5):378-9.
8. Laffey DA, Hay DJ. Isolated perforation of the gallbladder following abdominal trauma. *Postgrad Med J*. 1979;55:212-14.
9. Chen X, Talner LB, Jurkovich GJ. Gallbladder avulsion due to blunt trauma. *American Journal of Roentgenology*. 2001;177(4):822.
10. Gali BM, Ali N, Agbese GO, Duna VD, Dawha SD, Ismai GI, Mohammed M. Gallbladder perforation complicating typhoid fever: report of two cases. *Nigerian journal of medicine: journal of the National Association of Resident Doctors of Nigeria*. 2011;20(1):181-3.
11. Yagnik VD. Type-1 gall bladder perforation: Rare complication of cholelithiasis. *Saudi J Gastroentrol*. 2011;17:84.

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