

CASE REPORTS

Delayed Rupture of Gallbladder Following Blunt Abdominal Trauma

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ABSTRACT

A 29-year-old gentleman presented to surgery emergency with severe upper abdominal pain and vomiting. He reported to have been hit in his abdomen by a ball during a cricket match. Computerized tomogram of the abdomen revealed hematoma within the gallbladder lumen, laceration of segment six of liver, and hemoperitoneum. The patient did not agree for laparotomy advised to him, and so, managed conservatively. The patient reported back to us with high grade fever, jaundice, and painful abdominal distension after seven days of discharge from the hospital. His abdominal examination showed features of generalized peritonitis. Surgical abdominal exploration revealed a single perforation in the fundus of gallbladder with frozen Calot's triangle. Subtotal cholecystectomy was done. Histopathology of excised gallbladder revealed xanthogranulomatous inflammation. The present case report highlights that early exploration and cholecystectomy should be considered in patients with gallbladder injury to obviate the risk of delayed perforation.

INTRODUCTION

Gallbladder injury secondary to blunt abdominal trauma is a rare occurrence with a reported incidence of 2-6% (1). This low incidence is due to the peculiar anatomic location of the gallbladder, protected by the right lobe of liver and right lower ribs. Prompt clinical diagnosis of blunt gallbladder injury is difficult because of nonspecific or delayed presentation (2). In addition, injury to the gallbladder is masked by the presence of other concomitant intra-abdominal injuries particularly those involving the liver or spleen (3). De-

layed perforation, traumatic cholecystitis, and gallstone formation due to clot retention are some of the known complications following blunt gallbladder injury (4). We herein report a case of delayed traumatic rupture of gallbladder in a young man who sustained blunt abdominal trauma during a cricket match. □

CASE REPORT

A 29-year-old gentleman presented to emergency with severe upper abdominal pain and vomiting. He reported to have sustained blunt trauma to the right upper abdomen by a ball during a cricket match. The patient was he-

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modynamically stable; the abdomen was distended, with localized tenderness and guarding in the right upper abdomen. Chest X-ray showed bilateral clear lung fields with elevated right hemi diaphragm. Ultrasound of abdomen revealed free fluid in peritoneum with no solid organ injury. Computerized tomogram (CT) of abdomen showed hematoma in the gallbladder lumen, normal thickness of gallbladder wall, laceration of segment six of the liver and hemoperitoneum (Figure 1). Liver and kidney function tests were within normal limits. He was advised surgery which he categorically refused to undergo. So, he was managed conservatively. Although the abdominal symptoms were relieved on conservative management, the patient developed transient jaundice with low grade fever during the hospital stay. At the time of jaundice, liver function tests revealed serum bilirubin of 3.2 mg/dl (direct bilirubin of 1.8 mg/dl), alkaline phosphatase of 446 u/l, and transaminases were twice the normal value; ultrasonography was unremarkable – possibility of passage of blood clot was considered. He responded well to conservative treatment and was discharged after 20 days upon complete recovery.

After seven days of discharge from the hospital, the patient again presented with painful abdominal distension, high grade fever with chills, and jaundice of three days duration. His abdominal examination revealed distended abdomen with generalized rebound tenderness. Bile was aspirated on paracentesis. On exploratory laparotomy, a single 1×1 cm perforation was found in the fundus of the gallbladder. Subtotal cholecystectomy was done in view of dense adhesions around the Calot's triangle. The patient had an uneventful recovery and was discharged on sixth postoperative day. Histopathology of the resected specimen revealed evidence of xanthogranulomatous changes in the gallbladder wall. The patient was well after 2 years of follow-up. □

DISCUSSION

The most commonly injured areas of the extra hepatic biliary tract following blunt abdominal trauma, in descending order of frequency, are the gallbladder in 80% of the cases, the common bile duct, the hepatic duct confluence, and the left hepatic duct (5). Most blunt injuries to the gallbladder result from a local-

ized direct blow to the gallbladder or rapid shearing acceleration-deceleration force involved in motor vehicle accidents, sports injuries and falls (1). Injury to the gallbladder can be classified as contusion, laceration, perforation, and avulsion. Risk factors for blunt gallbladder injury include a thin-walled and distended gallbladder, and alcohol ingestion which increase the sphincter of Oddi tone thus elevating intra biliary pressure (2). In contrast a chronically diseased gallbladder with thickened fibrosed wall is less prone to perforation following blunt abdominal trauma (5). Delayed rupture of gallbladder results from a traumatic intramural hematoma compromising the local blood supply to the wall or an unrecognized perforation that was sealed off initially by the surrounding omentum and intestines, and is suspected when the intra abdominal bilious collection increases in size or gets secondarily infected (6).

Traumatic perforation of a non-infected gallbladder leads to spillage of sterile bile into the peritoneal cavity. These patients do not have features of acute abdomen and such injuries can take up to six weeks to become clinically apparent (2). Gradually worsening abdominal discomfort, distention, nausea, vomiting, persistent ileus, icterus, and low grade fever are the commonly encountered symptoms but these are not specific for gallbladder injury. Imaging techniques like ultrasound, CT and magnetic resonance cholangio-pancreatography (MRCP) are useful diagnostic aids in these pa-



FIGURE 1. Axial section of the CECT abdomen shows gallbladder hematoma with evidence of hemoperitoneum in the peri-hepatic and perisplenic space.

tients. Of all the imaging modalities, intravenous and oral contrast enhanced abdominal CT (CECT) is the preferred tool for evaluation of injury to the intraperitoneal solid organs including gallbladder and retroperitoneum. The CECT findings associated with gallbladder injury are - pericholecystic fluid collection, blurring of the gallbladder contour, collapsed gallbladder lumen, high-attenuation density intraluminal blood, focal thickening or discontinuity of gallbladder wall, a mass effect on adjacent duodenum, and streaky omentum or mesenteric fat (7). Pericholecystic fluid collection is considered the most sensitive but least specific indicator of gallbladder injury (3). MRCP provides high-resolution images of the extrahepatic biliary tract and pancreatic duct, but its use is limited in emergency setting as it requires the patient to be hemodynamically stable and to remain lying down for a longer period of time for evaluation in the MRCP suite (8).

Non operative management has a role in hemodynamically stable pediatric patients with blunt injury limited to the liver or gallbladder (9); however, emergency cholecystectomy is the preferred treatment as the risks of subsequent delayed complications exceed any known benefit of preserving the gallbladder. Delayed presentation is usually associated with an inflamed and an extremely friable gallbladder, not amenable to a total cholecystectomy. Partial cholecystectomy below the level of tear is a safe option in this scenario.

Finding of xanthogranulomatous changes was a histopathological surprise in our patient. Xanthogranulomatous cholecystitis (XGC) is a destructive inflammatory process of gallbladder occurring principally in association with gallstones or biliary obstruction (10). The significance of XGC lies in the fact that it often mimics gallbladder carcinoma leading to diagnostic and therapeutic dilemma for the treating surgeon (11, 12). XGC is associated with a high incidence of complications, such as local infiltration, fistulation, stricture formation and perforation of the gallbladder. The possible explanation of XGC seen in our patient is the traumatic disruption of gallbladder mucosa which would have caused lipids from the luminal bile to enter into the gallbladder wall through these mucosal defects and initiate the process of granulomatous inflammation. Though there was no risk factor (gallstones or biliary obstruction) for pre-existent XGC, its possibility cannot be completely eliminated.

We believe one should have low threshold for early exploration and cholecystectomy in patients with blunt gallbladder injury as the risks associated with cholecystectomy is far less than the risks of development of delayed complications.

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REFERENCES

1. **Shanmuganathan K, Mirvis SE** – CT scan evaluation of blunt hepatic trauma. *RadiolClin North Am* 1998;36:399-411
2. **Sharma O** – Blunt gallbladder injuries: Presentation of twenty two cases with review of the literature. *J Trauma* 1995;39:576-580
3. **Chen X, Talner LB, Jurkovich GJ** – Gallbladder avulsion due to blunt trauma. *Am J Roentgenol.* 2001;177:822
4. **Rodriguez-Montes JA, Rojo E, Martín LG** – Complications following repair of extra hepatic bile duct injuries after blunt abdominal trauma. *World J. Surg.* 2001;25:1313-1316
5. **Soderstrom CA, Maekawa K, Dupriest RW, et al.** – Gallbladder injuries resulting from blunt abdominal trauma. *Ann surg* 1981;193:60-66
6. **Fabian TC, Bee TK** – Liver and biliary tract. In: Trauma 6th edition. Felciano DV, Mattox KL, Moore EE (editors). USA: Mc Graw Hill;2008. pp.637-660
7. **Erb RE, Mirvis SE, Shanmuganathan K** – Gallbladder injury secondary to blunt trauma: CT findings. *J Comput Assist Tomogr* 1994;18:778-784
8. **Ragozzino A, Manfredi R, Scaglione M, et al.** – The use of MRCP in the detection of pancreatic injuries after blunt trauma. *EmergRadiol* 2003;10:14-18
9. **Ozturk H, Dokucu AI, Onen A, et al.** – Non-operative management of isolated solid organ injuries due to blunt abdominal trauma in children: a fifteen year experience. *Eur J PediatrSurg* 2004;14:29-34
10. **Guzman-Valdivia G** – Xanthogranulomatous cholecystitis in laparoscopic surgery. *J GastrointestSurg* 2005;9:494-497
11. **Garg PK, Pandey D, Mridha AR, et al.** – Xanthogranulomatous Inflammation of Gallbladder and Bile Duct Causing Obstructive Jaundice Masquerades Gallbladder Cancer: a Formidable Diagnostic Challenge Continues. *J Gastrointest Cancer.* 2014 May 7. [Epub ahead of print] PubMed PMID: 24802227
12. **Garg PK, Pandey D, Sharma J** – The surgical management of gallbladder cancer. *Expert Rev GastroenterolHepatol.* 2014 Aug 26:1-12. [Epub ahead of print] PubMed PMID: 25155211.