Necrotizing Gallbladder Torsion Masking as Acute Cholecystitis: A Review of Two Cases Treated with Successful Laparoscopic Cholecystectomy

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INTRODUCTION

Gallbladder torsion is a rare disorder occurring when the gallbladder twists along its axis and only approximately 500 cases have been reported in the English literature [1,2]. Preoperative diagnosis is difficult due to similar signs and symptoms and image findings as other acute cholecystitis [3]. Emergent cholecystectomy is the preferred treatment in most cases. However, delays in treatment may result in poor prognosis and a high mortality rate because of gallbladder ischemia, necrosis, and perforation [4]. We herein report two cases of gallbladder torsion which was difficult to diagnose preoperatively and was confirmed intraoperatively and treated successfully with laparoscopic cholecystectomy.

CASE REPORT

1. Case 1

An 87-year-old female presented to the emergency department with a 6-day history of upper abdominal pain and diarrhea. This was associated with decreased appetite and nausea. On arrival at the emergency department, the patient was afebrile (36.4°C), pulse rate of 90 beats/min, blood pressure of 130/85 mm Hg, respiratory rate of 22 breaths/min, and pulse oximetry of 100% in room air. Her abdominal examination revealed tenderness on the epigastric and right abdomen. Murphy’s sign was not clear.

Laboratory parameters showed a markedly elevated white cell count, neutrophilia, and C-reactive protein (14.32 × 10^3/µL, 94.1%, 279.32 mg/L). Other laboratory results were largely unremarkable with normal bilirubin and liver function tests. An abdominal computed tomography (CT) showed a distended gallbladder and mild thickening of the gallbladder wall (Fig. 1). She was admitted to the medical department for conservative treatment of gastroenteritis and acalculous cholecystitis. The patient failed to improve symptomatically and 3 days later underwent an emergent operation with laparoscopy. A close examination revealed that the gallbladder was not fixed in the liver bed and rotated around its pedicle in a 360 counterclockwise direction (Fig. 2). Laparoscopic de-torsion and cholecystectomy were done and she recovered well and was discharged on day 4 postoperatively. The patient provided written informed consent for the publication of clinical details and images.
2. Case 2

The second case is an 82-year-old female, who presented to the emergency department after a 1-day history of whole upper quadrant pain. She also had right upper quadrant tenderness without a positive Murphy’s sign. Laboratory parameters showed a mildly elevated white cell count, neutrophilia, and C-reactive protein (12.96 × 10³/µL, 91%, 24.23 mg/L). Other laboratory results were largely unremarkable with normal bilirubin and liver function tests. A CT and magnetic resonance cholangiopancreatography (MRCP) showed a markedly distended gallbladder with enhancing wall and no intraluminal stones and the fundus of the gallbladder is displaced toward the abdominal center (Fig. 3). An
emergent operation was done and the gallbladder was also twisted in a 360 counterclockwise direction. The gallbladder was dark and congested without evidence of perforation (Fig. 4). The gallbladder was distorted and routine laparoscopic cholecystectomy was performed. Histopathological examination of the gallbladder showed a necrotic wall and features suggestive of acute cholecystitis. She recovered well and was discharged on day 3 after the operation. The patient provided written informed consent for the publication of clinical details and images.

Fig. 3. (A) Computed tomography scan showed a large, distended gallbladder with normal wall thickness. (B) Magnetic resonance cholangiopancreatography showed the fundus of the gallbladder is displaced toward the abdominal center (arrow).

Fig. 4. Intraoperative image showing the torsion of necrotizing gallbladder (arrow) (A, B) and after detorsion and cholecystectomy (arrow) (C, D).
A Review of Two Cases of Gallbladder Torsion Treated with Successful Laparoscopic Cholecystectomy • Jung HI

DISCUSSION

Gallbladder torsion is rare and occurs secondary to the twisting of the gallbladder on its mesentery. Anatomical variation is thought to play a role in its pathogenesis, with an abnormally long mesentery joining the gallbladder to the liver, resulting in a free-hanging or “floating gallbladder,” which was first described by Wendel [5] in 1898. The highest incidence of gallbladder torsion occurs in the elderly population, with 85% of cases occurring in people between the ages of 60 and 80 years old [6]. Adult women are reportedly more affected than men, with a 3:1 female to male ratio [4]. The etiology of gallbladder torsion is not entirely clear, but there are two common predisposing anatomical factors: a wide mesentery that support cystic duct and artery, and a small liver bed of the gallbladder that can flat the gallbladder freely. These variations allow the rotation of the gallbladder along its long axis, causing vascular compromise due to ischemic compression of the cystic artery. Torsion is classified as complete, which is ≥180° of rotation, and incomplete, <180° of rotation [7].

Gallbladder torsion is a separate entity that can mimic other causes of cholecystitis. Gallbladder torsion is difficult to diagnose [8], but if treated according to acute cholecystitis, an urgent situation can be avoided. However, in most cases like our first case, when the initial signs and symptoms were not clear likewise other acute cholecystitis, the operation could be delayed due to suspicion of another disease [9]. And in the majority of cases, the patient is older and has many underlying diseases, acalculous cholecystitis can be often managed non-operatively with a growing trend toward percutaneous cholecystostomy as the initial and sometimes definitive management [4]. However, in cases of gallbladder torsion, conservative treatments such as intravenous antibiotics and percutaneous cholecystostomy could be ineffective and result in even fatal. Hence, preoperative diagnosis is important as it requires urgent surgical management.

Preoperative CT and MRCP findings and imaging such as ultrasound and CT are often obtained yet rarely reveal the diagnosis of gallbladder torsion. CT imaging findings suggestive of possible gallbladder torsion include a fluid collection between the gallbladder and the gallbladder fossa of the liver, a horizontal arrangement of the long axis of the gallbladder, a well-enhanced cystic duct located on the right side of the gallbladder, and signs of inflammation such as edema and gallbladder wall thickening [3,10]. MRCP imaging findings may aid in the preoperative diagnosis of gallbladder torsion by showing a V-shaped distortion of the extrahepatic bile ducts due to a twisting of the cystic duct. Additionally, a high-intensity signal on T1-weighted images within the gallbladder wall could indicate a possible infarction [3]. Other studies report a “cystic duct knot sign” on ultrasonography and a CT finding of a “whirl sign” in cases reported cases of gallbladder torsion [10]. Our patient exhibited a distended gallbladder with possible wall thickening and a dilated and redundant gallbladder on CT imaging. However, a diagnosis of gallbladder torsion was not suspected based on these imaging findings alone and the definitive diagnosis of gallbladder torsion was not made until surgery. Once identified, diagnosis and treatment via laparoscopy or laparotomy should result in prompt detorsion and cholecystectomy.

In conclusion, torsion of the gallbladder is a rare but clinically important condition that is primarily seen in elderly women. Current imaging modalities are unreliable for obtaining a preoperative diagnosis. However, this diagnosis must be considered in the differential of elderly women patients with signs and symptoms of acalculous cholecystitis with the absence of biliary stones and a free-floating gallbladder.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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