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A case of gallbladder torsion: A rare cause of acute abdomen

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ABSTRACT

Introduction: Gallbladder torsion is a rare cause of acute abdominal pain caused by twisting of the gallbladder along the axis of the cystic duct and the cystic artery with subsequent biliary and arterial obstruction. Case Report: We present a case of an 84-year-old female who presented with gallbladder torsion and was managed successfully with laparoscopy converted to an open cholecystectomy. Conclusion: Early surgical management is critical to prevent complications including gallbladder perforation and subsequent biliary peritonitis.

Keywords: Acute abdomen, Cholecystectomy, Gallbladder torsion, Gallbladder volvulus

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INTRODUCTION

Gallbladder torsion, or gallbladder volvulus, is a rare cause of acute abdominal pain, and is caused by an organo-axial torsion of the gallbladder at the level of the cystic duct and the cystic artery [1]. Normally, the gallbladder is prevented from twisting due to its firm attachment to the liver, and it is thought that the torsion requires the presence of anatomical variations with local mesenteric redundancy [1]. Subsequent obstruction of bile and blood flow due to torsion rapidly leads to gangrene of the gallbladder followed by perforation and bile peritonitis [2].

Due to the infrequent nature of this condition, the exact incidence of gallbladder torsion is unknown. However, it is estimated that about 500 cases have been reported in the literature since it was first described by Wendel in 1898 [3–5]. Gallbladder torsion most commonly affects elderly females, with a female: male ratio of 4:1 [3]. Gallbladder torsion tends to be a disease of the elderly, with the majority of cases occurring between 60 and 80 years of age, and the median age being 77 [3]. Although much less common, gallbladder torsion can also affect children, in which case, it occurs more frequently in boys with a male: female ratio of 2.5:1 [3].

In this case report, we present a case of an 84-year-old female with gallbladder torsion who was successfully managed with an open cholecystectomy, together with a review of literature regarding clinical features, characteristic imaging findings, and management.

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CASE REPORT

An 84-year-old female presented to the Emergency Department with an 18-hour history of abdominal pain in her right upper abdomen followed by multiple vomits. Her past medical history included noninsulin dependent type 2 diabetes, hypertension, dyslipidemia, gastro-esophageal reflux disease, and a melanoma excised from left lower limb with subsequent left inguinal lymph node dissection followed by radiotherapy 13 years ago with no subsequent recurrence.

On physical examination, she was tachycardic to a heart rate of 115 beats per minute, temperature of 36.5°C, blood pressure of 120/80 mmHg, and an oxygen saturation of 96% on room air. Her abdomen was distended with diffuse abdominal tenderness and guarding mainly in the right upper quadrant (RUQ). There was no palpable RUQ mass or jaundice, and Murphy's sign was negative.

Laboratory examination revealed leukocytosis of 20.7 × 10^9/L and normal liver function tests. A computed

tomography (CT) scan of the abdomen was obtained which revealed a significantly dilated gallbladder with mildly dilated extrahepatic bile ducts, and intraperitoneal free fluid (Figure 1).

Acute cholecystitis was thought to be the most likely diagnosis, and the patient was taken to the operating theater shortly after assessment. Laparoscopy revealed a free-floating gallbladder, which was gangrenous and grossly distended with no attachment to the liver. The gallbladder appeared to have twisted on the cystic duct (CD) and cystic artery (CA) (Figure 2). Note was also made of dark serosanguinous free fluid throughout the peritoneal cavity with inflammatory adhesions and fibrin. The distended gallbladder made laparoscopic visualization difficult, and the torsion of the CD and CA made laparoscopic dissection of Calot's triangle challenging. Hence, a conversion from laparoscopy to a midline laparotomy was made, and an open cholecystectomy was carried out.

The patient made a slow but good postoperative recovery and was discharged 10 days following her surgery. Histopathological assessment of the gallbladder was consistent with that of acute gangrenous cholecystitis.

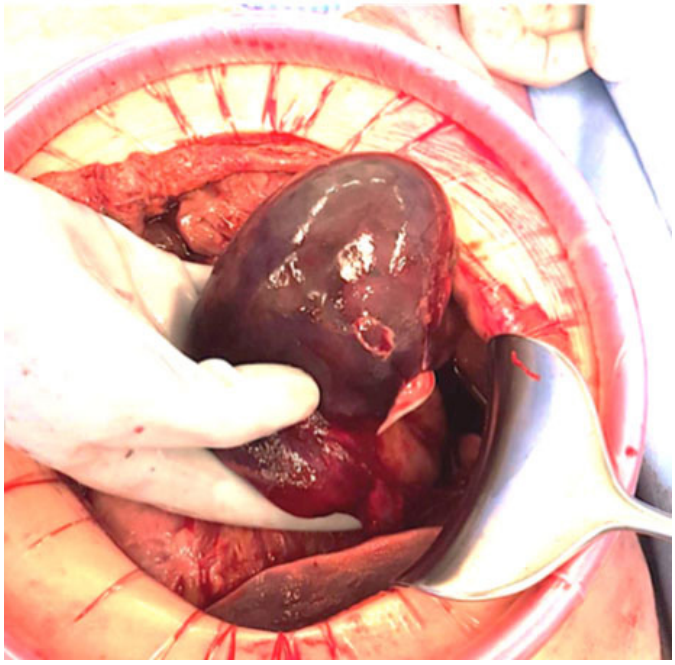

Figure 2: Intraoperative photo demonstrating a free-floating gallbladder which is distended and has a necrotic wall, along with a twist at the cystic duct (in front of the surgeon's index finger).

DISCUSSION

Gallbladder torsion occurs when the gallbladder twists at the level of gallbladder neck or cystic duct along the axis of cystic duct and cystic artery. The exact etiology of gallbladder torsion is unclear, although it is thought that one of two following congenital anatomical variants is a prerequisite for the torsion to occur [6]. The first anatomical variant is when both the gallbladder and the cystic duct hang off the liver on a mesentery, and the second variant is when the gallbladder is completely detached from the liver but the cystic duct is supported by a mesentery [6]. It has also been postulated that in the elderly, the loss of visceral fat and atrophy of the liver with subsequent elongation of the mesentery may contribute to the torsion [7].

Figure 1: CT of the abdomen and pelvis showing a distended gallbladder (white arrow) which does not appear to be attached to the liver and intraperitoneal free fluid.

Patients with torsion of the gallbladder most often present with severe acute abdominal pain which may be diffuse or localized to the right abdomen. The pain may be accompanied by nausea, vomiting, or anorexia. Typical examination findings include tachycardia in the absence of fevers or jaundice, and there may be a tender mass in the right abdomen [8]. Laboratory tests typically reveal leukocytosis with normal liver function tests.

Due to its rarity, the diagnosis of gallbladder torsion can be difficult to make prior to surgery, with only about a quarter of cases being diagnosed preoperatively [3]. Lau et al. [8] described three triads which may be exhibited by patients with gallbladder torsion which can be utilized to help with early identification. The first triad is the triad of patient characteristics, which consists of elderly females, a thin body habitus, and either a spinal deformity or chronic chest disease. The second triad, or the triad of symptoms, comprises of abdominal pain which is usually located on the right side, early onset of symptoms, and

a relatively short duration of symptoms. The third and final triad, the triad of physical signs, includes a palpable abdominal mass, the absence of toxemia or jaundice, and a discrepancy between pulse and temperature (typically tachycardia without a fever).

There are also typical radiological features reported in the literature that may help with the diagnosis. Ultrasonography can demonstrate a gallbladder which is not in contact with the liver with signs of gallbladder inflammation, such as thickened gallbladder wall and sonographic Murphy's sign [9]. In addition, ultrasound may identify features of a twisted cystic duct, which may appear as a conical-shaped structure or as an echogenic nodule near the gallbladder neck [9, 10]. Characteristic findings of gallbladder torsion on CT include an inflamed gallbladder which is detached from the liver, with the degree of gallbladder distention being greater than what would be expected from acute cholecystitis [11]. Computed tomography may also demonstrate a "whirl sign," indicating twisted cystic duct and its mesentery [12]. Finally, characteristic findings on magnetic resonance cholangiopancreatography (MRCP) are a v-shaped distortion of the extrahepatic bile ducts, a twisting interruption of the cystic duct, and a distended gallbladder [13].

In gallbladder torsion, obstruction of biliary drainage and blood flow can rapidly lead to gallbladder necrosis then subsequent perforation and biliary sepsis if left untreated [2]. The treatment of choice is early surgical intervention with laparoscopic or open cholecystectomy. Prognosis with gallbladder torsion is good, especially with prompt diagnosis and surgical management, with a mortality rate of 6% [3].

CONCLUSION

Gallbladder torsion is an uncommon cause of acute abdomen. Typically, gallbladder torsion is observed in elderly females, and has characteristic features on ultrasonography and on CT. This condition has a good prognosis with early surgical management, but delay in management can lead to perforation of the gallbladder and biliary sepsis. Through this report, we hope to emphasize the importance of early identification and a low threshold for operative management when the diagnosis is suspected.

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Author Contributions

Ho Nam Choi – Conception of the work, Design of the work, Drafting the work, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Yasser Arafat – Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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Authors declare no conflict of interest.

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All relevant data are within the paper and its Supporting Information files.

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