

Gallbladder torsion: A case study

**Yasser Arafat, Marianna Zukiwskyj, Tarana Lucky, Mojgan Rahimi,
Polbert Diaz, Suntharalingam Shivananthan**

ABSTRACT

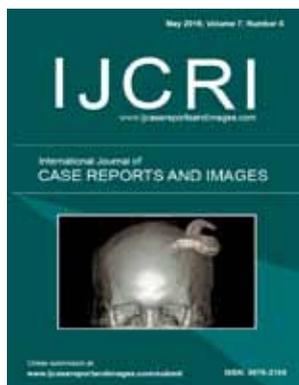
Introduction: Torsion of the gallbladder is a rare condition and an important differential of an acute surgical abdomen. While early surgical intervention reduces the risk of disease progression to life-threatening complications, and thus avoids high morbidity and mortality, it is difficult to make a preoperative diagnosis of gallbladder torsion.

Case Report: In this report, we describe a case of acute gallbladder torsion in an elderly male whose clinical presentation mimicked acute acalculous cholecystitis with local inflammatory reaction resulting from gangrenous gallbladder. The 81-year-old male was treated with emergency exploratory laparotomy. Except for developing an ileus requiring longer term recovery his post-operative period was otherwise uneventful and no further complications were evident in his follow-up clinic assessment.

Conclusion: There is a wide range of differential diagnoses for patients presenting with acute surgical abdomen. Rare but life-threatening condition such as gallbladder torsion still remains a diagnostic challenge. Early diagnosis is the paramount in managing patients with gallbladder torsion as immediate surgical intervention is required. Keeping high index of clinical suspicion for patients presenting to emergency department with acute abdomen, especially in elderly population followed by diagnostic imaging can aid prompt diagnosis and thus facilitate early treatment.

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Keywords: Abdominal pain, Acute abdomen, Gallbladder torsion, Gallbladder volvulus, Gastrojejunostomy

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INTRODUCTION

Acute abdomen is a commonly encountered presentation in general surgical patient, for which there is a wide spectrum of surgical diagnoses. Torsion of

the gallbladder (also known as gallbladder volvulus) is an extremely rare but an important differential in the context of acute surgical abdomen. Since its initial description in 1898 by Wendel [1], only approximately 500 cases of gallbladder torsion have been reported in literature. In absence of early recognition and prompt surgical intervention gallbladder torsion may incur significant morbidity and mortality. The condition poses a diagnostic challenge preoperatively to both surgeons and radiologists, and often presents as a surprise to surgeons intraoperatively [2].

Gallbladder torsion occurs due to rotation of the gallbladder along the axis of the cystic duct and vascular pedicle. It can be either incomplete (rotation less than 180 degrees, usually gradual onset) or complete (rotation more than 180 degrees, usually acute onset) [3]. Both clockwise (occurs as a result of gastric and duodenal peristalsis) and anticlockwise rotations (secondary to colonic peristalsis) have been described [4].

While definite aetiology remains uncertain, multiple reasons for torsion of the gallbladder have been postulated by authors. In a review by Pottorf et al. [5], absence of gallbladder fixation to the liver resulting in excessive mobilization ability of gallbladder, relaxation and atrophy of a previously normal mesentery in the elderly (also known as visceroptosis) causing mesenteric elongation and thinning, atherosclerosis of the cystic artery and a tortuous cystic duct, and congenital anomalies that predispose individuals to elongated mesenteries have been reported as possible explanations.

The underlying pathophysiology related to congenital anomalies is thought to be secondary to a redundant wide mesentery or a mesentery that covers the cystic duct and artery. This causes the suspended gallbladder to twist along the axis of the cystic duct and cystic artery and result in a volvulus [6]. While peristaltic movement of the stomach and colon have also been reported as a possible attribute to the torsion of the gallbladder, the mechanism of movement that may actually cause the torsion still remain unclear. Loss of visceral fat with liver atrophy from conditions such as ageing may also result in acquired long mesentery which may explain the increased incidence of gallbladder torsion in elderly thinner population [5]. Gallbladder torsion is more frequently encountered in the elderly population with 85% of the cases reported between the ages of 60 and 80 years. While there is a female preponderance with a female to male ratio of 3:1, it is reported to be more common amongst boys than girls in the pediatric population, with a pediatric male : female ratio of 4:1 [7].

We report a case of gallbladder torsion in an elderly male which presented as a case of acute acalculous cholecystitis. This report also aims to review information currently available in literature relevant to the clinical aspect of this rare condition.

CASE REPORT

An 81-year-old male was presented to the emergency department with gradually worsening abdominal pain with symptoms of obstipation for approximately two weeks. He had presented to emergency department two days prior, and had been discharged with aperients, with little effect. His past medical history included gastrojejunostomy in 1968 for duodenal ulcers, appendectomy many years before, and multiple spinal fusions.

He had a low-grade temperature measured by the ambulance staff. However, he was afebrile with a blood pressure of 95/58 mmHg and heart rate 86 bpm on presentation. On physical examination, signs of dehydration and diffuse tenderness and guarding in the right upper quadrant (RUQ) and epigastrium were noted. There was no palpable RUQ mass or jaundice, and the Murphy's sign was negative. Laboratory evaluations showed mild leukocytosis (10,700 /mm³), and an elevated CRP of 327. Otherwise, the investigations including the liver function test were grossly normal.

Computed tomography (CT) scan with IV contrast on day of presentation revealed dilatation of intra- and extra-hepatic bile ducts, and a dilated and non-well-defined gallbladder with some free fluid adjacent to liver. However, there was no evidence of calculi and radiologist could not appreciate any specific cause to explain dilated bile ducts (Figure 1). An ultrasound scan was ordered in the context of diagnostic uncertainty, however was not carried out as his clinical condition deteriorated. Hence decision to operate was made based on physical examination, radiological findings, and presence of raised inflammatory markers.

An emergency exploratory laparotomy was performed, revealing copious pus and fibrin upon entry into the peritoneal cavity. The pericholecystic area was inflamed, and a torqued and gangrenous, but un-perforated gallbladder was found (Figure 2). The rest of abdomen was unremarkable. The cystic duct was dissected and clipped and an intraoperative cholangiography (IOC) was performed which demonstrated a significantly dilated common bile duct and some kinking of the bile duct in the mid-third (Figure 3a). However, no filling defects were appreciated and free flow to the duodenum was noted (Figure 3b). Due to technical difficulty an antegrade cholecystectomy followed by copious peritoneal lavage was carried out. Drains were inserted to Morrison's pouch and pelvis, and abdomen was closed following satisfactory hemostasis. Histopathology of the surgical specimen showed an acute gangrenous cholecystitis.

Postoperatively, the patient developed an ileus which resolved with conservative management. His recovery was otherwise uneventful. The patient was discharged on the eighth postoperative day with a planned follow-up in the outpatient clinic in 4-6 weeks time. Follow-up clinic assessment was satisfactory with no evidence of any further short-term or long-term complications.

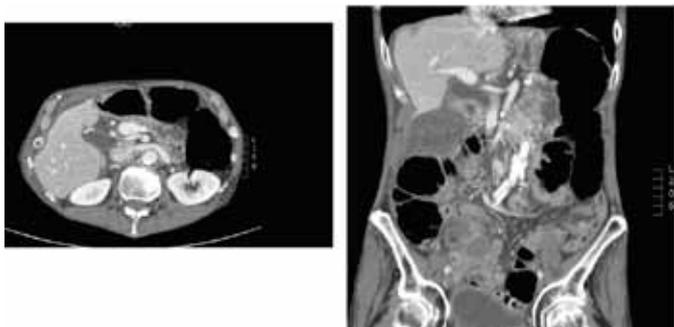


Figure 1: Abdomen computed tomography with intravenous contrast: a fluid filled, not well-defined structure noted inferior to the liver with small amount of fluid adjacent to the liver, likely dilated gallbladder.

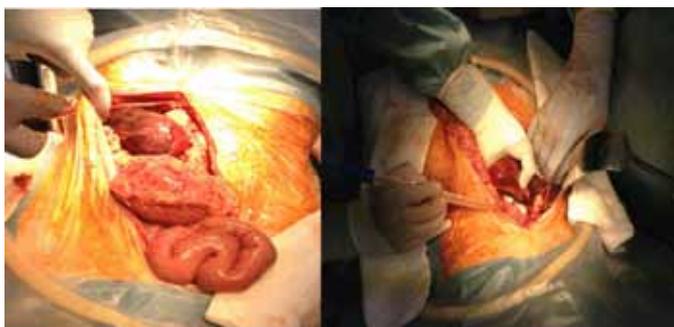


Figure 2: Operative findings: A torted and gangrenous gallbladder.

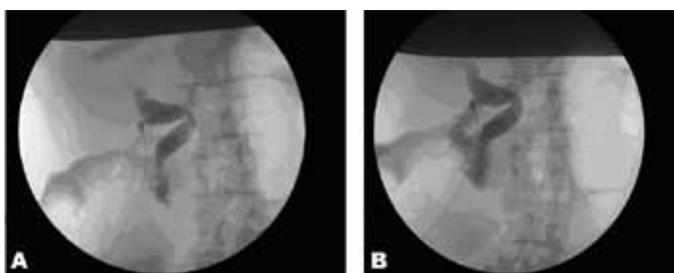


Figure 3: (A) Intraoperative cholangiogram showing dilated common bile duct and some kinking of the bile duct in the mid third but, (B) no filling defects and free flow to the duodenum.

DISCUSSION

Torsion of the gallbladder is a rare clinical condition of the hepatobiliary system, with a reported clinical incidence of 1 in 365,520 hospital admissions [2]. Review of the current literature shows that gallbladder volvulus commonly presents as an acute cholecystitis, although isolated cases of gallbladder torsion mimicking acute appendicitis have also been reported [6, 8]. Since no single clinical, serologic, or radiographic finding is pathognomonic, this condition is often misdiagnosed as acute acalculous cholecystitis, making a correct preoperative diagnosis challenging [4, 5, 9]. According to a review by Reilly et al. [4], a preoperative diagnosis of gallbladder torsion was made in 32 of 125 (26%) patients

reported within the last 20 years and death as an outcome was reported in seven of the 113 patients presenting after 1991 representing a mortality rate of 6%. The main complications associated with delayed diagnosis and treatment includes necrosis, gangrene and subsequent perforation of the gallbladder resulting in contamination of the abdominal cavity with bilious material. Given the diagnostic dilemma and significant morbidity and mortality, gallbladder torsion should be considered as a differential diagnosis in any patients presenting with acute surgical abdomen, especially in those who show clinical deterioration despite antibiotic treatment.

The clinical features of gallbladder torsion usually include low grade fever and jaundice, poor response to antibiotic therapy, and acute onset of abdominal pain. These may be helpful in the differential diagnosis from acute cholecystitis. Moreover, a highly suggestive sign of gallbladder torsion observed by ultrasonography or CT is a markedly enlarged “floating” gallbladder with a continuous hypoechoic line indicating edematous change in the wall. Magnetic resonance studies (i.e. MRCP) can also be useful in establishing preoperative diagnosis. Diagnostic features in MRCP may include V-shaped distortion of extrahepatic bile duct, twisting interruption and tapering of the cystic duct, midline shift of the gallbladder with distension and enlargement, and also observation of different intensities of gallbladder, extrahepatic bile ducts, and cystic duct [3]. A triad of triads has also been reported in literature that is used to recognize potential gallbladder volvulus. Originally described by Lau et al., the clinical features for gallbladder torsion can be grouped into three triads. These include a triad of physical characteristics (usually thin built, elderly patient with either chronic chest disease or a spinal deformity); a triad of symptoms (relatively short history of presenting symptoms including abdominal pain and vomiting of early onset); and a triad of physical signs (presence of an abdominal mass along with absence of toxemia or jaundice and a discrepancy between pulse and temperature). Lau et al. [10] suggested that if most of these features are present, torsion of the gallbladder should be a diagnostic consideration. As expected, our patient demonstrated most of the aforementioned clinical features.

Current literature suggests that an early emergency cholecystectomy should be performed when gallbladder torsion is suspected, preferably done using a laparoscopic approach as it is minimally invasive with a reported postoperative recovery period of 2–3 days [2, 6]. Moreover, compared to a classic cholecystectomy a laparoscopic approach for gallbladder volvulus is considered to be easier since a long mesentery is often present and the gallbladder is minimally adherent to the liver bed [2]. In our case, however, an exploratory laparotomy was performed. The decision to proceed with laparotomy was made in view of patient’s clinical presentation and subsequent rapid deterioration, gross distension of gallbladder evident through imaging, and

also diagnostic uncertainty. There was in fact a tormented necrotic gallbladder which was removed, although there was no difficulty identifying the cystic duct and artery. While the postoperative period was otherwise uneventful he developed a postoperative ileus requiring a longer term hospital stay and recovery. It may be postulated that had the diagnosis of gallbladder torsion been considered preoperatively, laparoscopic approach would have been more favorable which would possibly have resulted a shorter recovery time.

CONCLUSION

The diagnosis of gallbladder torsion should be considered in all elderly patients presenting with symptoms suggestive of acute or non-resolving symptoms and signs of cholecystitis, particularly in the absence of gallstones. It is a rare condition and requires a high index of clinical suspicion. To achieve the best patient outcome, early diagnostic imaging and prompt surgical intervention are crucial. Recognition of the typical presentation described herein along with utilization of early diagnostic imaging studies can lead to accurate preoperative diagnosis. Thus, with early emergent cholecystectomy mortality and morbidity related to delayed treatment of this rare clinical condition can be reduced.

Author Contributions

Yasser Arafat – Substantial contributions to conception and design, Acquisition of data, Analyses and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of version to be published

Marianna Zukiwskyj – Substantial contributions to conception and design, Acquisition of data, Analyses and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of version to be published

Tarana Lucky – Substantial contributions to conception and design, Analyses and interpretation of data, Drafting the article, Revising it critically for important intellectual content, Final approval of version to be published

Mojgan Rahimi – Substantial contributions to conception and design, Acquisition of data, Analyses and interpretation of data, Drafting the article, Final approval of version to be published

Polbert Diaz – Substantial contributions to conception and design, Analyses and interpretation of data, Revising it critically for important intellectual content, Final approval of version to be published

Suntharalingam Shivananthan – Substantial contributions to conception and design, Analyses and interpretation of data, Revising it critically for important intellectual content, Final approval of version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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