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Gallbladder Volvulus: An Unusual Presentation

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Conflict of interest: None declared

Patient: Female, 57-year-old
Final Diagnosis: Gallbladder volvulus
Symptoms: Abdominal and/or epigastric pain
Medication: —
Clinical Procedure: Laparoscopic cholecystectomy
Specialty: Surgery

Objective: Rare disease
Background: Gallbladder torsion is a rare entity of acute abdomen that can be fatal if not diagnosed and treated promptly. It presents in a multitude of ways but the most common is a presentation similar to acute cholecystitis. Diagnosis can be made clinically by abdominal ultrasound with Doppler flow, and treatment is detorsion with cholecystectomy.

Case Report: A 57-year-old female presented to the emergency department with severe abdominal pain, bilious vomiting, and loose stools. An initial diagnosis of gastroenteritis was made, however, the patient did not respond to symptomatic treatment and continued having pain, nausea and vomiting. Abdominal ultrasound revealed signs of acute cholecystitis and the patient underwent an open cholecystectomy where the gallbladder was found to be black, gangrenous, and voluminous due to torsion. Detorsion and cholecystectomy were performed without any complications.

Conclusions: Gallbladder torsion is a rare entity of acute abdomen that can be fatal if not diagnosed and treated promptly. Gallbladder torsion should be a part of the differential diagnosis of any patient presenting with an acute abdomen and unusual symptoms of acute cholecystitis.

MeSH Keywords: Cholecystectomy • Cholecystitis • Gallbladder Diseases

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/916233v>

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Background

Gallbladder torsion with resulting volvulus is a rare entity of acute abdomen. It was first described in 1898 by Wendel in a 25-year-old pregnant woman [1]. Since then, over 500 cases of gallbladder torsion have been reported with an incidence of approximately 1 in 356 000 hospital admissions [2]. The most common presentation of gallbladder volvulus is that of acute cholecystitis, and a preoperative diagnosis of gallbladder volvulus is rarely made [3]. Unlike acute cholecystitis, gallbladder volvulus carries the risk of perforation [4], thus early diagnosis and prompt treatment of gallbladder volvulus is imperative, as it decreases mortality and morbidity from a perforated gallbladder and ensuing peritonitis [3,4]. In this report we present a case of gallbladder volvulus that initially presented as gastroenteritis then with the findings of acute cholecystitis on imaging.

Case Report

A 57-year-old female presented to the emergency department with severe upper abdominal pain, 2 episodes of bilious vomiting, and one episode of loose stools. The patient's only medical history is hypertension that is adequately controlled. On presentation she was hemodynamically stable and afebrile.

On physical examination the patient had a soft non-distended abdomen with normal bowel sounds; epigastric pain on deep palpation was noted as well as right upper quadrant tenderness, however Murphy's sign was negative. The patient's laboratory studies including leukocyte count, hepatic enzymes, and pancreatic enzymes were all within normal range.

An initial diagnosis of viral gastroenteritis was made based upon the patient's presentation with vomiting and loose stools, as such the patient was given symptomatic treatment. The patient had no relief from the pain and was given pethidine 75 mg subcutaneously, also without improvement in pain. Due to these unusual findings, the patient was admitted to the hospital for further workup. During this time the patient was still experiencing nausea and vomiting resistant to medications (metoclopramide and ondansetron).

An abdominal ultrasound was performed which showed findings of acute cholecystitis with microlithiasis without signs of dilation of intra or extra-hepatic bile ducts. A diagnosis of acute cholecystitis was made, and the patient was planned for cholecystectomy less than 24 hours of admission. An open approach was agreed upon due to the unusual presentation of resistant pain, recurrent vomiting, and a new finding on physical examination of a palpable mass in the right upper quadrant.

Figure 1. Paramedian incision on the right below the costal margin, black gangrenous voluminous gallbladder was visualized.

Figure 2. A clockwise torsion around the gallbladder axis was identified.

Figure 3. Cystic duct and cystic artery were identified by dissection, they were ligated and cut.

Figure 4. Gallbladder was separated from its hepatic attachment and excised. The common bile duct was observed with careful attention

Operative findings included a black, gangrenous, and voluminous gallbladder with a large mesentery displacing the gallbladder from the liver bed (Figures 1–4). A clockwise torsion around the gallbladder axis was noted, detorsion was done manually, and the cholecystectomy proceeded without any complications. The patient was discharged home on the third day following surgery.

Discussion

Gallbladder volvulus is a rare condition that might carry significant mortality risk if not identified and treated early on in its course. The frequency of this disease increases with age, with some reports stating an average age between 60 and 80 years old [5,6]. Gallbladder volvulus has a predilection among adult females with a female: male ratio of 4: 1, however, the reverse is true in the pediatric population with a female: male ratio of 1: 3 [6]. The literature reports a mortality rate up to 6% [6,7] if promptly treated and 100% if left untreated [3].

It is hypothesized that certain congenital gallbladder anomalies might predispose to torsion. Of particular importance is the free-floating gallbladders classified by Gross [8] into 2 types: type A where a long and wide mesentery supports both the gallbladder and the cystic duct, and type B, where an incomplete mesentery supports only the cystic duct. Four other anatomic variants of the gallbladder have been described that might increase the risk of gallbladder volvulus [3,5]. The first variant is a congenital anomaly where the pars cystica fails to migrate normally from the hepatic diverticulum during week 4 to week 7 of embryological development which causes a complete absence of the gallbladder mesentery. The result is

a free-floating gallbladder suspended by the cystic duct and artery alone. The second abnormality is a result of normal aging where the gallbladder mesentery elongates and becomes mobile; this combined with atrophy of the liver increases the risk of gallbladder torsion. The third anomaly is described as a detached fundus of the gallbladder from the liver bed, increasing its mobility and the risk of torsion. The fourth variant is also the rarest and is a normal gallbladder fixed to a mobile hepatic lobe. Volvulus might be complete (180° torsion or less) or incomplete (more than 180°) [9], and it might be clockwise or anticlockwise [6]. Our patient had a large and elongated gallbladder mesentery which is the result of normal aging and might have contributed to the clockwise torsion of the gallbladder.

Clinical presentation of gallbladder volvulus is non-specific and variable, it ranges from acute abdomen to chest pain, but most commonly present similarly to acute cholecystitis with right upper quadrant pain [5,9]. Presentation can be correlated with the type of torsion, recurrent episodes of incomplete torsion might lead to recurrent pain [3], as such a careful history must be obtained from the patient. Clinical symptoms include abdominal pain, nausea and vomiting, and a palpable mass in the right quadrant [3–5,7,9]. A triple triad has been described to clinically differentiate between acute cholecystitis and gallbladder volvulus [3,5,7]; the first is patient characteristics where there is increased risk of torsion among the elderly, thin, or patients with spine deformities. The second triad is based on clinical symptoms of sudden onset pain, right upper quadrant pain, and emesis all of which favor gallbladder torsion. The third triad is of clinical signs seen on physical examination; a non-toxic appearing patient with pulse temperature discrepancy and a palpable mass in the right upper quadrant make the diagnosis of gallbladder torsion more likely. The case presented here is unusual, as the patient had signs and symptoms suggestive of gastroenteritis which is an extremely unusual presentation for gallbladder volvulus that has not been described in the literature.

Preoperative diagnosis of gallbladder volvulus has increased from 10% [3–5] to 26% [6], most likely due to advancements in imaging modalities. Ultrasound is the preferred modality, as a first line of imaging [3], to diagnose both acute cholecystitis and gallbladder volvulus, however distinguishing between these 2 entities might not always be possible, as both might show wall thickening and surrounding edema with gallstones [3–6], as was the case with our patient. Another differential diagnosis that can be made based on ultrasound findings is acalculous cholecystitis since gallbladder torsion might present with no gallstones [3–6]. Certain signs on ultrasound have been solely described in gallbladder torsion which might assist in diagnosis [3], these include a free-floating gallbladder detached from the liver bed or a floating gallbladder with

discontinuity of the lumen. Another finding described in gallbladder volvulus is the presence of a continuous hypoechoic zone between 2 echogenic areas which signifies venous and lymphatic stasis [3–5]. Doppler ultrasound can confirm the diagnosis by the absence of blood flow in the cystic artery [3–5], however this method is not routinely used probably due to the low index of suspicion for gallbladder torsion.

To be more precise ultrasonography and computed tomography (CT) are the primary imaging approaches used for diagnosis. But the difference a CT scan can reveal a “floating gallbladder” with gallbladder wall thickening. A magnetic resonance imaging (MRI) can help with the imaging of a twisted cystic duct, and T2 weighted images are beneficial for evaluating necrosis of the gallbladder wall. Early diagnosis of gallbladder torsion can help to prevent life-threatening complications such as gallbladder gangrene, perforations causing bilious peritonitis, and other infections. For preventing this sequela, ultrasonography and CT are the primary imaging approaches. Early use of appropriate imaging prevents complications, reduces mortality and morbidity rates, and decreases hospitalization costs [10,11].

Treatment of gallbladder volvulus is emergency cholecystectomy, as delay in treatment might increase the risk of perforation, peritonitis, and death [3,4]. A laparoscopic approach has been described and is the preferred method for detorsion and cholecystectomy [3–5,7]. We opted for an open approach as the diagnosis was unclear and the patient had an unusual

presentation of what was presumed to be acute cholecystitis based on ultrasound. Percutaneous drainage of the gallbladder might sometime be wrongly performed due to the initial diagnosis of acute cholecystitis in an elderly patient with contraindications to laparoscopy [5]. Drainage should not be performed for gallbladder volvulus as it will only address the patient’s symptoms, and the torsion will continue to exist further increasing the risk of perforation and peritonitis [4,5].

Conclusions

Gallbladder volvulus is an uncommon occurrence that is mainly seen among elderly women and is frequently undiagnosed pre-operatively due to unspecific presentations that might mimic acute cholecystitis. Improvements in imaging modalities have assisted physicians in making the diagnosis of gallbladder volvulus; ultrasound is the modality of choice as a first line of imaging [3], and Doppler might be used if there is a high index of suspicion for gallbladder volvulus. Once the diagnosis of gallbladder volvulus is made, prompt treatment with laparoscopic cholecystectomy must be performed. Early detection and prompt treatment are imperative as delay in diagnosis might be fatal.

Conflict of interests

None.

References:

1. Wendel A: A case of floating gallbladder and kidney complicated by cholelithiasis with perforation of the gallbladder. *Ann Surg*, 1898; 27(2): 199–202
2. Vedanayagam M, Nikolopoulos I, Janakan G, El-Gaddal A: Gallbladder volvulus: A case of mimicry. *Case Rep*, 2013; 2013: pii: bcr2012007857
3. Lemonick D, Garvin R, Semins H: Torsion of the gallbladder: A rare cause of acute cholecystitis. *J Emerg Med*, 2006; 30(4): 397–401
4. Nakao A, Matsuda T, Funabiki S et al: Gallbladder torsion: Case report and review of 245 cases reported in the Japanese literature. *J Hepatobiliary Pancreat Surg*, 1999; 6(4): 418–21
5. Boer J, Boerma D, de Vries Reilingh T: A gallbladder torsion presenting as acute cholecystitis in an elderly woman: A case report. *J Med Case Rep*, 2011; 5(1): 588
6. Reilly D, Kalogeropoulos G, Thiruchelvam D: Torsion of the gallbladder: A systematic review. *HPB (Oxford)*, 2012; 14(10): 669–72
7. Alkhalili E, Bencsath K: Gallbladder torsion with acute cholecystitis and gross necrosis. *BMJ Case Rep*, 2014; 2014: pii: bcr2014204917
8. Gross RE: Congenital anomalies of the gallbladder. A review of 148 cases, with report of double gallbladder. *Arch Surg*, 1936; 32(1): 131–62
9. Gog A, Robert B, Mouly C et al: Gallbladder volvulus: A rare case of acute cholecystitis. *Diagn Interv Imaging*, 2013; 94(9): 893–95
10. Bauman Z, Ruggero J, Lim J: Gallbladder volvulus presenting as acute appendicitis. *Case Rep Surg*, 2015; 2015: 629129
11. Drubay V, Vanwest L, Tchanderli R, Van Agt CE: [Gallbladder volvulus]. *Presse Med*, 2015; 44(4 Pt 1): 478–80 [in French]