

Diagnosis and Laparoscopic Approach to Gallbladder Torsion and Cholelithiasis

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ABSTRACT

Torsion of the gallbladder is common in elderly women. Different causes have been proposed for this rare condition. The presence of a long mesentery and loss of visceral fat are the main causes for the development of torsion. Patients present with a sudden, acute pain in the right upper quadrant, suggesting cholecystitis. Different imaging methods have shown particular findings, but the diagnosis is still complex. Today, just a few cases have been reported in the literature. The treatment for this condition consists of surgical detorsion and cholecystectomy. Gallbladder torsion is a very rare entity and should be suspected when these clinical findings are present.

Key Words: Gallbladder, Torsion, Volvulus, Cholelithiasis.

INTRODUCTION

Gallbladder torsion or volvulus was first described in 1898 by Wendel.¹ Since then, about 400 cases have been reported in the literature. This entity is more common in elderly females between the sixth and eighth decades and has a female to male ratio of 3:1. The cause has been attributed to anatomical variations of the gallbladder mesentery and the loss of visceral fat as well as a long mesentery with cystic artery and duct known as “floating” gallbladder.²⁻⁵ The presence of gallstones is rare and has been described in only 24% of patients with torsion.⁶ Gallbladder torsion diagnosis is usually not made preoperatively, among other things, because ultrasound (US) and computerized tomography (CT) findings are not specific. Laparoscopic cholecystectomy is the actual recommended treatment; however, just a few cases have been resolved this way. We present a case of gallbladder torsion with cholelithiasis treated with laparoscopic cholecystectomy.

CASE REPORT

An 80-year-old female with a positive history for cigarette smoking, Wolf-Parkinson-White disease, paludism, appendectomy, hemorrhoidectomy, hypothyroidism, depression, and vascular disease presented to the emergency department with a 24-hour onset of colicky, generalized abdominal pain, with no fever, nausea, or vomiting. She reported a change in her intestinal habits for the last 5 days. Physical examination revealed normal vital signs, moderate dehydration, normal heart sounds with no murmurs, and normal breath sounds on auscultation. The abdomen showed tenderness, pain with palpation on the right upper quadrant, no rebound, normal bowel sounds, absence of Murphy’s sign, right costovertebral angle tenderness, and the rectal examination was normal. Blood laboratory tests and an ultrasound were requested. Laboratory results were the following: leucocytes 20,300, Hb 14.5 g/dL, hematocrit 43%, platelets 202,000, bands 9%, urea 42.8 mg/dL, glucose 110 mg/dL, creatinine 0.8 mg/dL, Na 139 mmol/L, potassium 4.0 mmol/L, and chloride 103 mmol/L. The abdominal US revealed acute lithiasic cholecystitis with dilation of intra- and extrahepatic biliary ducts, main bile duct of 9 mm, gallbladder measuring 11.5

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cm x 4.8 cm x 7.3 cm, with thickened wall measuring 5 mm to 8.2 mm in the neck, the presence of mobile hyperechogenic images compatible with stones and perivesicular collection (**Figure 1**). An abdominal CT showed an ovoid image measuring 11 cm x 7 cm with asymmetric thickening of the wall with low-density filling and an ovoid image in the interior measuring 2 cm in diameter, suggesting the presence of a stone (**Figure 2**). With these findings, acute cholecystitis was suspected. The patient went to the OR for laparoscopic cholecystectomy; however, during surgery a free necrotic gallbladder with a 360° counterclockwise torsion in its mesentery was found, and the diagnosis of gallbladder torsion was made. Laparoscopic detorsion and cholecystectomy were performed by clipping and cutting the cystic duct and the cystic artery without complications (**Figure 3**). A transsurgical cholangiogram showed no alterations. A Jackson-Pratt drain was left in place. The pathological examination of the specimen revealed a 15-cm x 13-cm x 0.4-cm gallbladder with a 0.3-cm wall and the presence of 2 cholesterol calculi measuring 2 cm each (**Figure 4**). Acute cholecystitis with transmural hemorrhagic coagulative necrosis and cholelithiasis was reported. The patient was discharged 5 days later.

DISCUSSION

Wendel in 1898 reported the first case of gallbladder torsion in a 23-year-old female.¹ In 1927, Shipley presented 21 cases that had been documented by that time.⁷ Gallbladder torsion has been reported in 50 patients in the last 30 years.⁸ The current incidence of gallbladder torsion

is 1 in 365,520 hospital admissions, most commonly seen in patients between the sixth and eighth decades, and the female to male ratio is 3:1.⁹⁻¹¹ The cause has been attributed to several factors; however, the presence of 2 elements are essential for the development of this pathology: first, a long mesentery that allows the gallbladder to turn along its axis, and second, the loss of visceral fat seen in older patients. These 2 elements allow free mobility of the gallbladder. Intense peristalsis of the stomach, duodenum, and colon as well as kyphoscoliosis and atherosclerosis of the cystic artery have also been associated.^{2,4,5,12} In this case, the patient was a thin elderly woman with significant kyphoscoliosis. In young patients, the torsion can reduce spontaneously because elasticity of the supporting structures is still present.¹³ A congenital mesentery is present in <5% of the general population, suggesting that the mechanism probably develops with age.¹⁴ Wendel described a configuration named the “floating gallbladder” where the gallbladder is pedunculated, hanging free of the liver, and attached only by the cystic mesentery, as it presented in our patient.¹ Krukenberg¹⁵ described this gallbladder to be “like a fruit hanging on its stem.” As shown in **Figure 3**, on laparoscopy the patient’s gallbladder was completely free, only attached by its mesentery. The presence of gallstones has only been described in 24% of the reported cases.^{5,6,12} This torsion has been classified as complete (>180°) or incomplete (<180°), and the presenting symptoms will be different in each case.¹⁶ The torsion can also appear in a clockwise or counterclockwise direction, and although the cause of both is due to the factors mentioned above, the direction of rotation is associated



Figure 1. Abdominal ultrasound showing the gallbladder with thickened wall and a hyperechogenic image suggesting the torted mesentery. The US Doppler shows no flow within the gallbladder.



Figure 2. Abdominal computed tomographic scan showing an enlarged gallbladder with asymmetric thickening of the wall with a low-density filling.

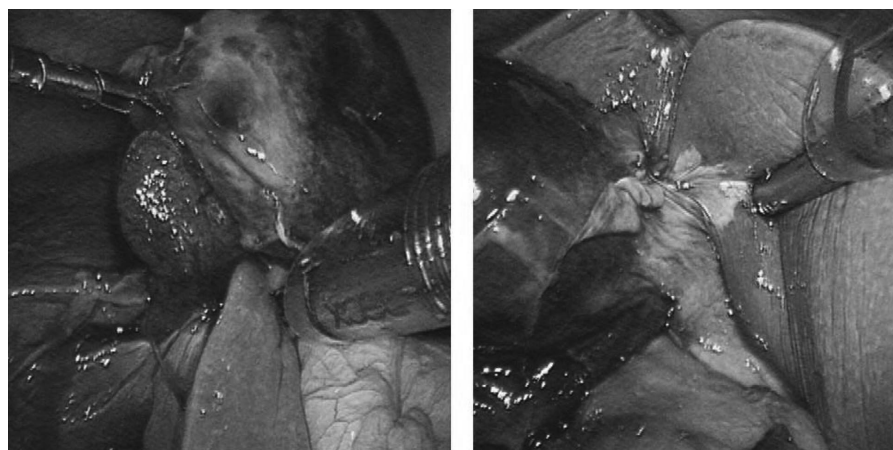


Figure 3. Necrotic floating gallbladder found at laparoscopy. Free necrotic gallbladder with a 360° counterclockwise torsion in its mesentery.

with gastric peristalsis in the clockwise or colonic peristalsis in the counterclockwise.¹⁷ The clockwise rotation is more common and has been reported in 51% of a previous study involving 245 patients.⁶ The torsion directly affects the blood supply to the gallbladder causing infarction and gangrene.¹¹ The clinical presentation can have nonspecific signs and symptoms. Therefore, the diagnosis is usually not made preoperatively. In the incomplete torsion, the patient may present with symptoms compatible with biliary colic, while those with complete torsion will have a history of sudden onset of severe right upper quadrant pain and vomiting. In some patients, a palpable gallbladder can be found on examination.¹⁸ Lau et al¹⁹ described 3 triads for the diagnosis of gallbladder torsion.

These triads consider symptoms, such as short history, abdominal pain, and early vomiting; physical signs including abdominal mass, absence of toxemia, and pulse rate-temperature discrepancy; and finally, patient's characteristics like thin complexion, old age, and deformation of the spine. Usually the patient is diagnosed with cholecystitis, but the absence of jaundice and fever along with the poor response to antibiotics can help the physician discard this diagnosis.²⁰ Laboratory tests can show high leukocytes and normal hepatic function tests. Imaging studies like abdominal US and CT are not specific. US shows a large gallbladder outside its anatomical fossa with a thickened wall surrounded by fluid. In some cases, gallstones can also be visualized.²¹ When applying color doppler to

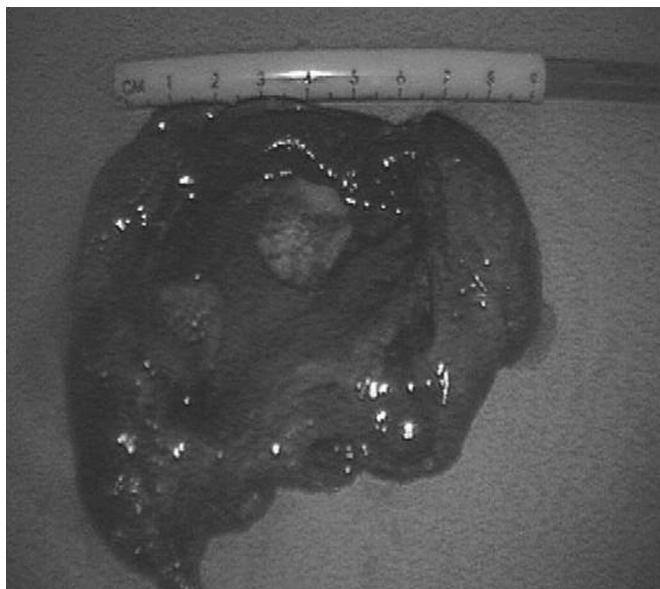


Figure 4. Open gallbladder showing the thickened wall and the presence of 2 gallstones.

the US, flow is absent in the torsed gallbladder. When color flow is present, the diagnosis of gallbladder torsion can be rejected and acute cholecystitis should be suspected.²² CT findings include the presence of fluid between the gallbladder and liver, a horizontal disposition of the gallbladder, enhancement of the cystic duct localized on the right side of the gallbladder, and images suggesting edema and thickening of the wall.²³ A distended gallbladder, similar to a bowel loop with a high attenuation circular structure to the right of the gallbladder, is considered a specific sign of gallbladder torsion by Merine et al.²⁴ The US and CT findings in our case coincide with the ones described for gallbladder torsion; however, it was not possible to establish the diagnosis preoperatively. Magnetic resonance imaging has also shown utility for the diagnosis of gallbladder torsion, and the findings include high-signal intensity from the gallbladder wall on T1 that suggests necrosis or infarction.¹⁰ The mortality when cholecystectomy is performed promptly is 3% to 5%.²⁵ Torsion of the gallbladder requires emergency surgical treatment. Cholecystectomy can be performed by an open or laparoscopic approach. The principles of this procedure are decompression, derotation, and cholecystectomy with or without transurgical cholangiogram.^{20,26,27} The use of percutaneous drainage is only recommended when the surgical procedure could represent a high risk to the patient.²⁸ According to Short and Paul,²⁹ the preoperative diagnosis of gallbladder torsion is possible when

some signs like acute pain and vomiting in an elderly female and the rapid appearance of a palpable and enlarged gallbladder are present. Today, the laparoscopic approach should be the treatment of choice when gallbladder torsion is suspected.

CONCLUSION

Torsion of the gallbladder is very rare, with just 300 cases reported since 1898. The diagnosis of gallbladder torsion is difficult to accomplish, especially because the data and the clinical features are not specific. US and CT usually suggest acute cholecystitis, and it is important to search for specific imaging findings for gallbladder torsion. Gallbladder torsion should be promptly resolved laparoscopically whenever the diagnosis is suspected.

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