



Case Report

Wandering Gallbladder: A Case Report

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Wandering gallbladder is a variation in the biliary anatomy described in the literature as being attached only by the cystic duct and its mesentery. Its propensity for torsion places it at risk for necrosis. There have been over 500 cases of gallbladder torsion reported in the literature but less than 10 reports of wandering gallbladder. To our knowledge there have been no reports of cholecystectomy for wandering gallbladder found incidentally. A 51-year-old male from Pakistan with hypertension, gastroesophageal reflux disease, high cholesterol, and renal stones presented with a chief complaint of right upper quadrant abdominal pain. Abdominal ultrasound was significant for a mildly distended gallbladder with small gallstones in the gallbladder fundus. The patient was discharged with a diagnosis of cholelithiasis and scheduled for laparoscopic cholecystectomy as an outpatient. During the procedure, upon entering the abdominal cavity, a gallbladder was not seen in the gallbladder fossa. It was attached to the cystic duct, thickened with a long mesentery and not attached to the liver. There were no signs of torsion. The patient was treated successfully and discharged home with an uncomplicated hospital course. Diagnosis can be challenging because the clinical presentation can be variable. Fewer than a dozen cases have been reported where the diagnosis was made preoperatively. Early diagnosis of gallbladder torsion with cholecystectomy is essential to avoid the deadly complications of perforation and bilious peritonitis. Understanding the pathophysiology, clinical findings, and treatment can have a broad impact across biliary surgery in preventing these complications.

Key words: Gallbladder – Wandering gallbladder – Hypermobility gallbladder – Gallbladder torsion – Free-floating gallbladder – Gallbladder rupture

Multiple variations exist in the anatomy of the biliary tree that can predispose people to various pathologies. One specific anatomic variant of interest is the free-floating or wandering gallbladder where the gallbladder is loosely attached to the inferior surface of the liver. Its lone attachments to the biliary system are by the cystic duct and its mesentery, which leads to abnormal mobility of the fundus and body of the gallbladder.¹ Its characteristic propensity for torsion places it at risk for necrosis.² It is believed to be present in 4% to 5% of the population and is associated with other anatomic abnormalities such as a hypermobile liver⁴ or an unusually long or absent mesentery.¹ Fewer than 10 cases of wandering gallbladder have been reported in the literature.³ We present a clinical case of cholelithiasis associated with a free-floating or wandering gallbladder successfully treated with cholecystectomy as well as a review of the literature.

Case Report

A 51-year-old male from Pakistan with a past medical history of hypertension, gastroesophageal reflux disease, high cholesterol, and renal stones presented to the Emergency Room for evaluation of right upper quadrant abdominal pain. Clinical evaluation showed that he was febrile and had a tender right upper quadrant. An ultrasound was done which showed a mildly distended gallbladder with small gallstones in the gallbladder fundus, no gallbladder wall thickening or pericholecystic fluid, and no intrahepatic or extrahepatic biliary dilation.

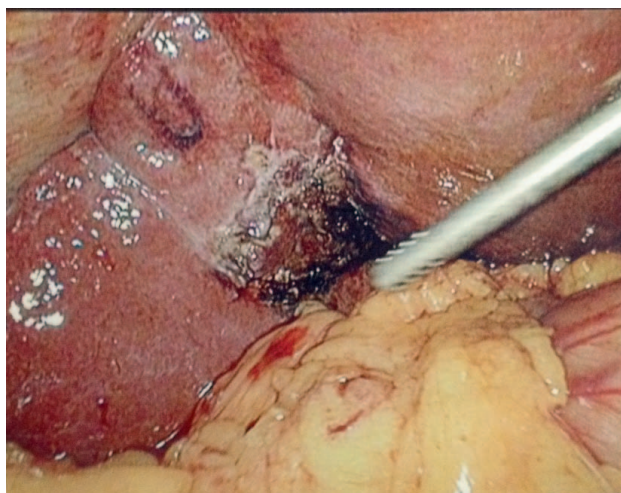


Fig. 1 Gallbladder fossa after adhesions removed; gallbladder not seen in gallbladder fossa.

The patient had a history of biliary stones, but had refused surgery in the past. At that time patient was discharged home with diagnosis of cholelithiasis and was scheduled for a laparoscopic cholecystectomy as an outpatient. The patient did not have any previous surgeries.

The patient was taken to the operating room for laparoscopic cholecystectomy. Upon entering the abdominal cavity several omental adhesions were noted in the gallbladder fossa. Upon taking down the adhesions, a gallbladder was not seen in the fossa (Fig. 1). The common bile duct was identified and traced up to the junction of the cystic duct. This was then followed up to the gallbladder, which was not attached to the liver and buried in the omentum. The gallbladder was thickened with a long mesentery, viable, with no signs of torsion (Fig. 2). After freeing the gallbladder from the omental adhesions the remainder of the cholecystectomy was uncomplicated (Fig. 3). The patient was successfully treated and discharged home with an uncomplicated hospital course.

Discussion

A wandering gallbladder is defined as a gallbladder, which is suspended only by the cystic duct and artery and is completely covered with peritoneum with no mesenteric attachment to the liver. It is believed to be a normal variant of gallbladder anatomy, seen in approximately 4% to 5% of the population.⁴ The etiology is thought to be secondary to abnormal migration of the pars cystica from the hepatic diverticulum during the fourth to seventh

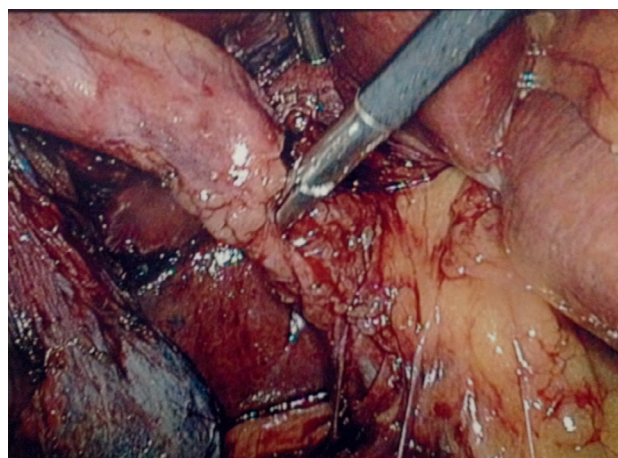


Fig. 2 Gallbladder located outside of the gallbladder fossa with long mesentery and no signs of torsion.

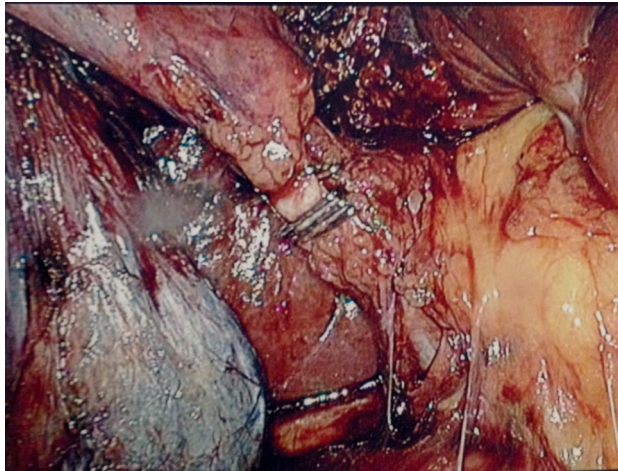


Fig. 3 Surgical clips placed around the mesentery containing the cystic duct and artery.

weeks of embryologic development.⁴ In elderly patients with a normal formed mesentery, liver atrophy and loss of visceral fat can lead to a hypermobile gallbladder that sits freely within the abdominal cavity.⁵

The first report of free-floating or wandering gallbladder was by Wendel in 1898 in a young woman who was found to have torsion of the gallbladder complicated by perforation.⁶ Wendel described the gallbladder as having a long cystic duct and mesentery, which was loosely attached to the inferior surface of the liver.⁶ This phenomenon is more common in the elderly but has been observed in young adults and children although it is extremely rare in children. Daux described the first case in a child in 1925 in an 11-year-old girl.⁷ Since that time, over 500 cases of gallbladder torsion have been reported in the literature² yet only approximately 10 cases of wandering gallbladder have been reported.³

The mechanisms leading to torsion are poorly understood. Gallbladder torsion is largely acquired and secondary to aging but also may be congenital. Three anatomic variants are believed to be responsible for torsion. The first variant, as presented in this case is due to a free-floating gallbladder suspended only by the cystic mesentery. In this scenario the gallbladder rotates around a vascular axis represented by the cystic artery. Another variant is when the gallbladder hangs from the liver through an elongated, narrow-based and freely mobile mesentery. This is thought to be due to age-related visceroptosis. Here the rotation occurs around an axis represented by the gallbladder itself

or its liver mesentery. A third variant described is extremely rare and consists of a normally fixed gallbladder to a mobile liver lobe free of its coronary and triangular ligaments. It is difficult to assess the frequency of occurrence of these various mechanisms because there is insufficient documentation. In conjunction with an anomalous anatomic configuration, a subsequent triggering event must occur to initiate torsion. Various triggering mechanisms have been mentioned including visceroptosis, weight loss, gastric or colonic hyperperistalsis, constipation or diarrhea, sigmoid volvulus, cholelithiasis, kyphosis, or iatrogenic manipulation.⁸

Wandering gallbladder is a risk factor for gallbladder torsion secondary to its long pedicle and no attachments to the liver. Diagnosis is difficult and is usually done when the patient becomes symptomatic. Patients with wandering gallbladder can present with biliary colic like symptoms attributed to torsion and detorsion around the cystic duct as well as acute cholecystitis secondary to persistent obstruction.³ Symptoms are nonspecific but some form of right upper quadrant abdominal pain is almost always present. Women, mostly in the 70- to 90-year-old age group are usually affected with a 3 to 1 female to male sex ratio. Patients frequently have nausea and vomiting. Physical examination may show nonspecific right-sided findings such as guarding, tenderness, and low-grade fever. A palpable gallbladder is found in 54% of cases.⁷ Mildly elevated white blood cell count is frequently found. Complete torsion with necrosis and perforation must always be considered when a free-floating gallbladder is seen on imaging and is suggested by gangrene, fever, peritonitis, and ileus.⁴ Variable presentations have been reported. Chiavarini *et al* in 1974 described a case of a 22-year-old with daily episodes of abdominal pain since childhood with a transient hyperbilirubinemia.² Likewise, Laso *et al* reported an 81-year-old female with abdominal pain and a palpable mass in the epigastrium and right upper quadrant.⁹

Preoperative diagnosis is difficult and rarely made. Fewer than a dozen cases have been reported in the literature where a preoperative diagnosis was made.⁷ There are no specific radiographic signs, but a gallbladder with a long cystic duct that is not in its normal anatomic position or low lying can be suggestive. Signs of cholecystitis such as a thickened gallbladder wall and pericholecystic fluid may also be seen. Torsion is suggested if the gallbladder is inferior to the liver in a transverse orientation with an echogenic conical structure, which is the twisted

pedicle. Ultrasound typically reveals cholecystitis with or without cholelithiasis.⁸ Few reports in the literature have described a free-floating gallbladder demonstrated on preoperative imaging.¹⁰ Morales *et al* described a low-lying gallbladder seen on computed tomography in their case report of a 70-year-old female with incidental wandering gallbladder.³ Despite this, diagnosis is typically made during exploratory surgery.

Treatment of gallbladder torsion is cholecystectomy, yet, to our best knowledge, no reports of cholecystectomy for wandering gallbladder with cholelithiasis found incidentally exist. Mortality from gallbladder necrosis secondary to torsion has been reported to be 6%.⁵ For this reason, we believe that given the propensity for a free-floating gallbladder to torsion, a low threshold for cholecystectomy is warranted. Marano *et al* describe 2 cases in which a free-floating gallbladder resulted in gallbladder torsion resulting in uncontrolled sepsis, multiple organ failure, and death.⁸ Therefore, it is essential to understand the pathophysiology and implications of a wandering gallbladder and its propensity for torsion. If diagnosed early and treated, it remains a benign condition. However, a delay in the diagnosis and management may lead to sequelae such as gallbladder rupture and peritonitis.

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