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Volvulus of the Gallbladder: A Case Report and Review of Literatures

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Abstract

Introduction: **Gallbladder volvulus is defined as the rotation of the gallbladder on its mesentery along the axis of the cystic duct and cystic artery. The presence of a redundant mesentery (floating gallbladder) is a prerequisite for volvulus. It is an unusual and rare occurrence with a predilection for women in their seventh or eight decades of life. The disease mimics acute cholecystitis symptoms.**

Objective: **The objective is to report a case of volvulus of the gallbladder, result of the treatment and review of the literatures.**

Case Report: **An 81-year-old Thai-Chinese female presented with several attacks of dyspepsia. On admission, whole abdomen sonography was performed which revealed gallstones with acute obstructive and suppurative cholecystitis. Open cholecystectomy was performed. The volvulus and gangrene of the gallbladder were found. The patient responded well to surgical treatment and had an uneventful recovery without any complications.**

Conclusions: **Volvulus of the gallbladder is a rare but life-threatening condition. Preoperative diagnosis is difficult. Surgery is the gold standard treatment. Early surgery is life saving.**

Keyword: Volvulus of the gallbladder

INTRODUCTION

Gallbladder volvulus is defined as the rotation of the gallbladder on its mesentery along the axis of the cystic duct and cystic artery. The presence of a redundant mesentery (floating gallbladder) is a prerequisite for volvulus. It is an unusual and rare occurrence with a predilection for women in their seventh or eight decades of life. Only about 300 cases have been reported in the literatures ranging from ages 2 to 100 years.[1] In 1898 Wendel AV.[2] reported the first case in a 23-year-old female. Shipley's article in 1927[3] described 21 cases of torsion of the gallbladder reported up to that time and added one of his own. The disease mimics acute cholecystitis symptoms. Because of these two conditions, preoperative diagnosis of the disease is difficult. However, the definitive diagnosis is usually made during surgery.

Suspected cases of gallbladder volvulus have been reported to be diagnosed preoperatively by ultrasonography[4], computed tomography and magnetic resonance cholangiopancreatography (MRCP). Nakao A, et al.[5] in 1999 reviewed 245 cases of gallbladder torsion in the Japanese literatures. The authors described a highly suggestive sign of gallbladder torsion observed by ultrasonography or computed tomography as a marked enlarged "floating" gallbladder with a

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continuous hypoechoic line indicating edematous change in the wall. Usui M, et al[6] in 2000 made a definitive diagnosis of gallbladder torsion by MRCP preoperatively. Their criteria for the diagnosis include 1) a v-shaped distorsion of the extrahepatic bile duct due to traction by the cystic duct, 2) tapering and twisting interruption of the cystic duct, 3) a distended and enlarged gallbladder that was deviated to the midline of the abdomen, and 4) a difference in intensity between the gallbladder and the extrahepatic bile ducts and the cystic duct. In 2006, Matsuhashi N, et al,[7] reported that characteristic radiography by coronal MRI and MRCP may be useful in making a definitive diagnosis.

Gallbladder volvulus leads to occlusive obstruction of biliary drainage and blood flow. Volvulus of the gallbladder is an acute surgical emergency that must be treated with immediate detorsion and cholecystectomy. With early diagnosis and surgical intervention, the disease maintains a low mortality of approximately 5%.[1]

Case Report

An 81-year-old Thai-Chinese female patient initially presented with signs and symptoms of gastrointestinal tract imbalance at the out-patient unit, Mayo Hospital, since September 1997. Symptomatic treatments were given.

On 12 March 2006, she was seen again with dyspepsia and more abdominal discomfort. She was treated at out-patient clinic with proton-pump inhibitor (PPI), and other medications to increase bowel motility and improve digestion.

On 15 March 2006, her symptoms did not improve. Vital signs were within normal limit. She complained of pain beginning at the epigastrium and later shifting to the right lower quadrant. She had no anorexia or vomiting but was constipated. Physical findings revealed tenderness at the right side of the abdomen, mild guarding and decreased bowel sound. The initial impression was appendicitis.

The laboratory results revealed WBC 10,000, PMN 91%, HCT 38%, normal PT/PTT, BUN/Cr 21/0.5, normal LFT, Na/K 135/3.9. Chest x-ray revealed mild cardiomegaly. Plain abdomen x-ray in the upright position revealed small bowel ileus in mid abdomen.

Whole abdominal sonography was performed which revealed enlarged gallbladder with septated and thick wall. The presence of multiple gallstones in the fundus and body with intraluminal fine echoes and tiny echogenic dots in the wall of the fundus of the gallbladder were noted. The CBD measured 7 mm in size. No gross fluid detected in the abdominal and pelvic cavities. Other findings were unremarkable. Sonographic diagnosis was gallstones with acute obstructive, suppurative cholecystitis.

The patient was then scheduled for operation and the open cholecystectomy through a right subcostal incision was performed on the same day. At operation, an enlarged, distended, gangrenous gallbladder was found. The gallbladder twisted 360° clockwise at the junction of the cystic duct. The cystic duct and cystic artery were elongated. The mesentery was short. The fundus of the gallbladder was located in right lower quadrant (Figure 1).

The gangrenous gallbladder was removed after a large clamp was applied proximal to the twisted point. The cystic artery and cystic duct were identified and divided. The mesentery was divided and the gallbladder was removed. Hemostasis was obtained. The cavity was irrigated with warm normal saline. A medium-size penrose drain was placed and the wound was closed in layers. The patient recovered without any immediate complications.

The specimen was sent for pathological examination. Gross pathological examination revealed a gallbladder measuring 13 cm in length and 6 cm in diameter. The surface was partly shaggy. The mucosa was dark red. The lumen contained brown fluid and

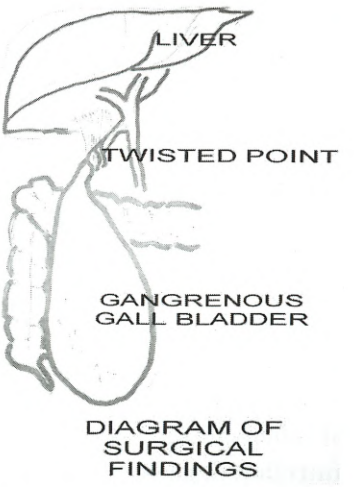

Figure 1 Diagram of surgical findings

several black stones, measuring from 0.3 to 0.8 cm in diameter. Microscopic examination revealed gallbladder tissue showing acute, severe inflammation with marked tissue destruction and hemorrhagic necrosis throughout the entire wall. There was no evidence of malignancy. The pathological diagnosis was acute gangrenous cholecystitis. Postoperatively, the patient had an uneventful recovery and was discharged satisfactorily.

Discussion

Volvulus of the gallbladder is a rare but a life-threatening condition. It is hardly described by commonly read standard textbooks of surgery.[8,9] Elderly females are most frequently affected. The peak incidence occurs in person age 65-75 years.[1] Misdiagnosis occurs frequently and patients are generally diagnosed as having acute cholecystitis. A delay in the diagnosis and treatment may lead to life-threatening situation.

Volvulus of the gallbladder is defined as the rotation of the gallbladder on its mesentery along the axis of the cystic duct and cystic artery.[1,10] It was first described by Wendel in America in 1989.[8,9,11] Approximately 300 cases have been reported.[1,8,11] Two types of torsion, incomplete (rotation <180°) and complete (rotation >180°) have been described.[11] Gross RE[12] suggested that the requirement for volvulus of the gallbladder to occur was the congenital predisposition of a minimally fixed gallbladder coupled with the loss of fat and elasticity leading to visceroptosis and increased mobility of the gallbladder. The more frequent occurrence in the elderly may be explained by the loss of fat and the atrophy of the tissues, leaving the gallbladder hanging freely. A constant finding is the presence of the gallbladder on a mobile mesentery (floating gallbladder).[8,10] The initiator of the volvulus would be the peristalsis in the transverse colon, duodenum, or gallbladder itself, kyphoscoliosis of the spine, and tortuous atherosclerotic cystic artery.[11] Intense peristalsis of the duodenum has been implicated in clockwise rotation, whereas the transverse colon is implicated in counterclockwise rotation. Volvulus of the gallbladder leads to occlusive obstruction of biliary drainage and blood flow. If the condition is unrelieved, gangrene develops.

Diagnosis of the condition is extremely difficult preoperatively due to the absence of specific clinical or imaging signs. Symptoms may be acute, recurrent, or subacute.[8] Gallstones may or may not be present.[9,11] Frequently, a provisional diagnosis of acute cholecystitis, acute appendicitis, perforated peptic ulcer, ileus or small bowel obstruction is made.[9] Whipple et al have suggested that the lack of apparent toxemia in a patient with acute cholecystitis may be a clue to torsion.[13]

Surgical treatment is technically easy because traction on the mobile gallbladder enables the anatomy of Calot's triangle to be readily identified. With early diagnosis and surgical intervention, the disease maintains a low mortality of approximately 3-5 per cent.[1,8] Schroder DM, et al,[14] reported the first case of laparoscopic cholecystectomy for gallbladder torsion in 1995. Kim SY, et al[15] in 2003 reported a gangrenous gallbladder wrapped in three complete rotations around its pedicle treated by laparoscopic cholecystectomy.

Conclusions

Volvulus of the gallbladder is a rare and dangerous condition. Preoperative diagnosis is difficult. A high index of clinical suspicion is very important. A delay in the diagnosis and treatment may lead to life-threatening condition. This condition should be included in the differential diagnosis of an acute abdomen.

Cholecystectomy, open or laparoscopically, is the treatment of choice. Open cholecystectomy was carried out in this reported case without incident. The postoperative course was unevenful.

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