ABSTRACT

Background: Volvulus of the gallbladder is an unusual event. Over 300 cases have appeared in the literature since first reported by Wendel in 1898, ranging in age from 2 to 100 years old. Unusual mobility of the gallbladder due to congenital anomalies is a constant factor in all occurrences.

Case Report: This is a report of a laparoscopic cholecystectomy in an 82-year-old white female with volvulus of the gallbladder presenting with a chief complaint of chest pain.

Conclusion: The patient had an uneventful recovery and was discharged within 72 hours after surgery, indicating that with the proper technique laparoscopic cholecystectomy is both feasible and safe in gallbladder volvulus.

Key Words: Volvulus, Gallbladder.

CASE PRESENTATION

An 82-year-old white female presents with acute onset of left lower chest pain radiating around the left lateral chest wall only. There was no previous history of similar episodes and no exertional component. The only significant past medical history was for hypertension treated with antihypertensive medication.

On physical examination, the vital signs were normal and the patient, other than the chest pain, was comfortable. The electrocardiogram (EKG) showed normal sinus rhythm with non-specific anterior segment changes. The white blood cell count (WBC) was 11,000, Na 130, K3.2, Cl.93 and glucose 170. Liver function tests were normal. The patient was admitted with the diagnosis of angina and possible myocardial infarction.

By the second day of admission, the WBC increased to 13,000. The cardiac isoenzymes were normal. Physical examination showed tenderness in the right upper quadrant area. An ultrasound of the gallbladder done on the third day of admission showed a thickened gallbladder wall of up to 11 mm, "posteriorly...multiple septations of the gallbladder wall" (Figure 1), and multiple stones. That day the WBC climbed to 18,100.

A surgical consult was called and the patient was taken to the operating room with the diagnosis of acute cholecystitis for laparoscopic cholecystectomy.

Laparoscopic exploration showed a gallbladder located away from its normal position and completely covered by the omentum with loose circumferential adhesions. The omentum was then gently "peeled off" the gallbladder with a blunt gauze dissector, uncovering a gangrenous edematous and distended gallbladder which was very difficult to manipulate. A 14-gauge angiocath was then inserted into the gallbladder percutaneously and connected to suction; sufficient amount of intracholecystic fluid was aspirated to allow grasping of the gallbladder wall. The gallbladder was then grasped at the fundus and retracted cephalad, exposing a twisted gallbladder pedicle (Figure 2). This pedicle was pink and healthy posteriorly and gangrenous anteriorly beyond the point of torsion. By coordinating the gall-
Figure 1. Ultrasound of Gallbladder. Notice the marked thickness of the gallbladder wall. The twisted pedicle of the gallbladder appears as "septations of the wall" posteriorly.

Figure 2. The twisted gallbladder pedicle leads to a thickened gangrenous gallbladder at its left; The anterior edge of the liver is visible to the right of the pedicle.

bladder grasper and the gauze dissector, the gallbladder was untwisted in a counterclockwise motion. With the gallbladder pedicle reduced, it was evident that it allowed an unusually high freedom of movement of the gallbladder, which was only partially attached to the liver at the level of the gallbladder neck (Figure 3). The cystic duct was cannulated with a #4 French ureteral catheter and a cholangiogram was done. The cholangiogram was normal. The pedicle was unusually long with the common bile duct stretched close to the level of the anterior edge of the liver (Figure 4). The cystic duct and artery were carefully identified and divided between hemoclips. The removal of the gallbladder off the liver bed was easily accomplished by dividing with cautery the limited area of gallbladder attachment to the liver bed (Figure 5). The gallbladder was then placed in a retrieval bag and removed through the epigastric stab wound. Aerobic and anaerobic gallbladder cultures were taken and both proved negative.

The postoperative course was smooth and uneventful. The patient was discharged home pain free, on the third postoperative day.

The Preop Diagnosis:

The initial clinical presentation of gallbladder volvulus varies widely. It may present with right upper quadrant or epigastric pain that may be of sudden onset with or without history of intermittent mild attacks. On one occasion, it presented as chest pain, as in this case, with subsequent development of right upper quadrant pain. It is safe to say that the clinical picture eventually settles down to the picture of acute cholecystitis.

Laboratory Tests:

The liver function tests are usually normal as the common bile duct is not obstructed. The WBC is invariably normal at the beginning of the presentation but as vascular compromise develops and gangrene sets in, the WBC climbs up to abnormal values.

Radiologically, the gallbladder ultrasound can be diagnostic for the alert eye when 1) the gallbladder is identified to be out of position with or without wall thickening 2) there is a septated or conical connection to the porta hepatis region representing the twisted gallbladder pedicle (Figure 1) and when 3) there is thickening of the gallbladder wall with the presence of a hypoechoic zone within the wall.

Patient Postoperative Length of Stay:

Very little information was available in the older literature concerning postoperative length of stay. In the very few references of length of stay for the postoperative conventional cholecystectomy for volvulus, the postoperative length of stays ranged from 6-19 days. The two laparoscopic cholecystectomy cases reported were discharged two days after surgery and this case three days postoperative indicating a much faster recovery in the laparoscopic group of patients.
DISCUSSION

Volvulus of the gallbladder is an unusual event. It can happen only when there is enough mobility of the gallbladder to allow it to rotate around a fixed pedicle by at least 180 degrees. This condition is fulfilled with the "floating" gallbladder in which the entire organ is covered with peritoneum and it is connected to the porta by a "stalk" or pedicle comprised by the cystic artery and duct enveloped in peritoneum. Rotation is also possible when the neck or body of the gallbladder is attached to the liver with a long pedicle allowing great mobility and rotation of the organ around its pedicle with volvulus as was the case in this presentation. There is no convincing evidence as to what the triggering factor or mechanism is for the volvulus to occur and the only constant element in the more than 300 cases in the literature is the abnormal mobility of the gallbladder. Several mechanisms for a triggering event have been suggested, such as intense gastric and duodenal peristalsis which will supposedly cause a clockwise torsion; peristalsis of the colon on the other hand can lead to a counterclockwise rotation and volvulus of the gallbladder. It is however, difficult to accept that intense peristalsis is the cause of the gallbladder volvulus. Peristalsis is a continuous occurrence and the floating gallbladder is reported to exist in up to 5% of the population.6,9 This combination should have made the incidence of gallbladder volvulus much higher than it really is, had the peristalsis hypothesis been true. Torsion of the gallbladder presents as acute cholecystitis which fails to improve by conservative treatment. The surgeon should have high index of suspicion for volvulus of the gallbladder and proceed with prompt surgical treatment.

DIAGNOSIS

Generally this is a condition of the geriatric population, with 85% of the cases reported in patients over 60 years old and with female-to-male ratio of 3:1,9 though it has been reported in patients ranging from 2 to 100 years old.6,15 The first report of laparoscopic cholecystectomy for volvulus of the gallbladder was submitted by Schroder and Cusumano III in 1994,6 followed shortly thereafter with a report by Nguyen, Geraci and Bauer.2
The technique of laparoscopic cholecystectomy for volvulus involves identifying and then exposing the gallbladder by peeling away the omentum. Percutaneous evacuation of the gallbladder is necessary to allow grasping by the instruments. Detorsion of the gallbladder is then done followed by careful identification of the cystic duct and artery. Extra care should be exercised during this phase of the procedure as the common bile duct may be stretched as far as the anterior edge of the liver as in this case (Figure 4) making it susceptible to injury by an unsuspecting surgeon. The cystic duct and artery are divided between hemoclips followed by the easy division of the pedicle completing the cholecystectomy.

CONCLUSIONS

Gallbladder volvulus is a rare condition occurring in patients with "floating gallbladder" mostly in the 7th and 8th decades of life. With a high index of suspicion, it can be diagnosed preoperatively by ultrasound. Laparoscopic cholecystectomy is feasible, safe and advisable, allowing a faster recovery and shorter hospital stay than conventional cholecystectomy.

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