Mirizzi Syndrome Type II: Is Laparoscopic Cholecystectomy Justified?

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ABSTRACT

Mirizzi syndrome type II is an uncommon cause of obstructive jaundice caused by an inflammatory response to an impacted gallstone in Hartmann's pouch or the cystic duct with a resultant cholecystocholedochal fistula. Two cases of Mirizzi syndrome type II are presented. Clinically only one patient had jaundice and endoscopic retrograde cholangiopancreatogram (ERCP) established a preoperative diagnosis of Mirizzi syndrome. The other patient's diagnosis of Mirizzi syndrome was made intraoperatively.

It is important to properly identify the anatomy at the time of surgery to avoid compromising the common bile duct. Operative treatment of Mirizzi syndrome type II includes laparoscopic or open subtotal cholecystectomy; placement of a T-tube with either laparoscopic or open cholecystectomy; or creation of a hepaticojejunostomy with cholecystectomy. Although there is a report of laparoscopic treatment of this syndrome without long term follow-up, we believe that once there is any question of injury to the common bile duct, safety demands that the laparoscopic procedure be converted to an open one with implementation of appropriate therapy.

Key Words: Mirizzi syndrome, Laparoscopic cholecystectomy.

INTRODUCTION

Mirizzi syndrome, first described in 1948, is where there is repeated inflammation of the gallbladder from a gallstone impacted in either the cystic duct or gallbladder neck. This leads to the formation of adhesions from the gallbladder to the common bile duct resulting in anatomic distortion of these structures.[1] Mirizzi syndrome is now classified into two types: in type I there is external compression of the common bile duct by a stone impacted in either the cystic duct or gallbladder neck resulting in inflammation in the triangle of Calot; in type II the severity of inflammation is greater, resulting in pressure necrosis between the cystic duct and common bile duct resulting in a cholecystocholedochal fistula.[2]

Mirizzi syndrome is found in less than 1% of all patients undergoing cholecystectomy. Symptoms are similar to that of acute and chronic cholecystitis, with or without jaundice.[3,4] Preoperative knowledge of the Mirizzi syndrome can be extremely helpful because the aberrant anatomy can predispose to common bile duct injury. Different surgical options can then be undertaken to adequately treat this entity.

CASE REPORTS

Patient 1:

A 70-year-old male who had experienced mild mid-epigastric pain with dark urine and pruritis was admitted to the medical service. The patient's medical history was significant for cholecystitis, cholelithiasis, diabetes mellitus and atrial fibrillation. On physical examination the patient was markedly jaundiced with significant right upper quadrant abdominal tenderness. Pertinent laboratory findings included a white blood cell count (WBC) of 7.9 K/UL, total bilirubin of 6.4 mg/dl, and alkaline phosphatase of 426 U/L.

The patient underwent an ERCP which showed a normal common bile duct and pancreatic duct **(Figure 1)**. The cystic duct contained stones; the cystic duct, common bile duct junction was not clearly delineated. Based on this information, it was felt that there would be significant inflammation in the triangle of Calot to preclude safe laparoscopic cholecystectomy. The patient subsequently

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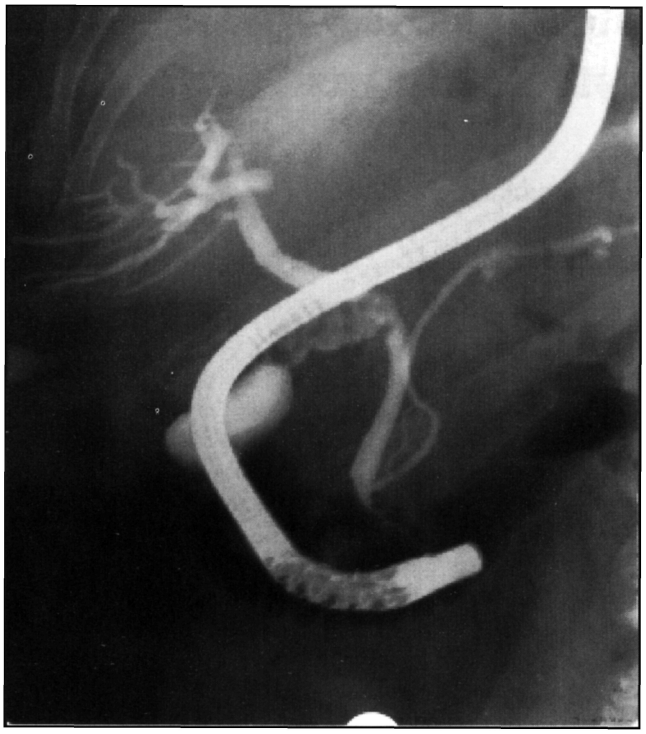

Figure 1. ERCP showing poorly defined cystic duct, common bile duct junction.

underwent an open cholecystectomy where a cholecystocholedochal fistula was discovered. A cholecystectomy, common duct exploration and choledochoplasty were performed. Six months postoperatively the patient had recurrent jaundice and a common duct stricture. The patient then had a hepaticojejunostomy created. This patient is doing well at 24 months follow-up.

Patient 2:

A 64-year-old male with a past medical history significant for cholecystitis was having increasingly frequent attacks of biliary colic. Ultrasound (US) of the gallbladder showed cholelithiasis and a normal-sized common bile duct. Physical examination was without jaundice, and was otherwise within normal limits. Laboratory values revealed a WBC of 7.6 K/UL, total bilirubin of 1.5 mg/dl, and otherwise normal liver function tests.

The patient underwent elective laparoscopic cholecystectomy and dense adhesions were found surrounding the gallbladder. After these were taken down a stone was found to be impacted in what was thought to be the cystic duct. After the duct was transected distal to the stone, further dissection revealed this to be part of the common bile duct. The operation was converted to open cholecystectomy and a cholecystocholedochal fistula was encountered. A Roux-en-Y hepaticojejunostomy was created. Postoperatively the patient did well and is doing well at 20 months follow-up.

DISCUSSION

The principal abnormality in Mirizzi syndrome starts with an inflammatory response to an impacted gallstone in Hartmann's pouch or the cystic duct. Repeated bouts of cholecystitis causes inflammation and fibrosis, Mirizzi syndrome type I. The recurrent inflammation results in pressure necrosis of the common bile duct and resultant cholecystocholedochal fistula, Mirizzi syndrome type II.[5]

Diagnosis of biliary symptomatology usually starts with an ultrasound. It is difficult to diagnose the Mirizzi syndrome with ultrasound alone. Ultrasound can reveal a dilated biliary ductal system with a gallstone impacted in the gallbladder neck. An ultrasound may also reveal compression and narrowing of the common hepatic duct.[6] Mirizzi syndrome has been diagnosed by computerized tomography (CT-scan) in one published report.[4] CT-scan will help to differentiate biliary, pancreatic and hepatic malignancies, but is not the best imaging modality to use to identify aberrant biliary anatomy. ERCP and percutaneous transhepatic cholangiography (PTC) are the most useful tests in evaluating biliary ductal anatomy and pathology. In this manner, the Mirizzi syndrome can be either diagnosed or suspected preoperatively.[2] ERCP and PTC can identify common bile duct obstruction from impacted stones and a resultant cholecystocholedochal fistula, although the cholecystocholedochal fistula may not be evident, as in our case. Since these findings can also be seen with hepatic, gallbladder, and ductal malignancies, ERCP and PTC may allow biopsy of any masses. Nonetheless, operative exploration remains the only way to accurately identify the disease process. For patients with jaundice and elevated liver function tests, as in our first patient, we recommend preoperative ERCP to evaluate and clear the common bile duct and define any aberrant anatomy. If the diagnosis of Mirizzi syndrome is made intraoperatively, a cholangiogram is needed to define ductal anatomy.

Classification of the Mirizzi syndrome has evolved from the original description in 1948 to the two types classified by McSherry to the four types classified by Csendes:[2,3,7]

- Type I: External compression of the common bile duct.
- Type II: A cholecystocholedochal fistula involving less than one-third of the circumference of the common bile duct.
- Type III: A cholecystocholedochal fistula involving less than two-thirds of the circumference of the common bile duct.
- Type IV: A cholecystocholedochal fistula destroying the entire wall of the common bile duct.

Types two, three and four in Csendes' classification system are a further sub-division of McSherry's type II classification. This further sub-division is important to recognize since the extent of the cholecystocholedochal fistula can have implications as how to best surgically correct it.

Surgical management of the Mirizzi syndrome when a cholecystocholedochal fistula is present is difficult because the inflammation distorts the anatomy in the area of dissection, increasing the risk of injury to the common bile duct. Often, the resulting inflammation has already injured the common bile duct and further iatrogenic division of the common bile duct is unavoidable or planned during its repair. When the diagnosis is made intraoperatively, a cholangiogram must be performed after any gallstones are removed from the decompressed gallbladder. Although with obliteration of the cystic duct, a cholangiogram becomes more difficult to perform laparoscopically through the gallbladder. If no cholecystocholedochal fistula is identified a sub-total cholecystectomy with or without common duct exploration can be performed (Mirizzi syndrome type I). This can be performed laparoscopically if the operation hasn't yet been converted to an open one. Surgical options in the presence of a cholecystocholedochal fistula include: suture repair of the cholecystocholedochal fistula; choledochoplasty with the gallbladder remnant; endoscopic biliary stent placement; end-to-end anastomosis over a T-tube; and biliary enteric anastomosis.[7-9] Stricture is common after choledochoplasty and end-to-end anastomosis over a T-tube, as in our first case; and bile leaks have been reported with lesser procedures.[7] Therefore, we recommend biliary enteric bypass in the setting of inflammation and a cholecystocholedochal fistula.

Sub-total laparoscopic cholecystectomy with or without common duct exploration can be performed in Mirizzi syndrome type I. Postoperative ERCP and sphincterotomy may be used for retained common duct stones in this setting. But in the presence of a cholecystocholedochal fistula, Mirizzi syndrome type II, we believe that conversion to an open procedure with common duct exploration and biliary enteric anastomosis is the safest procedure with the least morbidity.

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