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REVIEW ARTICLE

The Role of Laparoscopy in the Management of Mirizzi's Syndrome: A Review of Literature

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ABSTRACT

Minimal access surgery is increasingly becoming the preferred approach to general surgical treatment. Operative experience in the last two decades has established its efficacy and indeed safety in many trials at different centers all over the world.

Laparoscopic cholecystectomy (LC) has therefore become the gold standard of care for patients requiring removal of the gallbladder over this period. In 1992, a National Institute of Health (NIH) consensus development conference concluded that 'laparoscopic cholecystectomy provides a safe and effective treatment for most patients with symptomatic gallstones, laparoscopic cholecystectomy appears to have become the procedure of choice for many of these patients'.

The objective of this study was to review the literature on the use of laparoscopy in the management of Mirizzi's syndrome so as determine its role if any in current and future practice.

Keywords: Laparoscopic management of Mirizzi's syndrome, Cholelithiasis, Choledocholithiasis.

INTRODUCTION

Mirizzi's syndrome is a rare cause of acquired jaundice. It is caused by chronic gallbladder inflammation and large biliary stones resulting in compression of the common hepatic duct. It occurs in approximately 0.1% of patients with gallstone disease and 0.7 to 1.4% of patients undergoing cholecystectomy and it affects male and female equally, but tends to affect older people more often.[1-3] There is no evidence of race having any bearing on the epidemiology. The pathogenesis of this syndrome relates to multiple and large gallstones which can reside chronically in the Hartmann's pouch of the gallbladder, causing undue inflammation, necrosis, scarring and ultimately fistulation into the adjacent common hepatic duct (CHD). As a result, the CHD becomes obstructed by either scar or stone, resulting in obstructive jaundice. MS is therefore attributed to extrinsic compression of the common hepatic duct by gallstones impacted in the cystic duct or the gallbladder neck. Bile duct wall necrosis and subsequent cholecystobiliary fistula caused by chronic inflammation is a rare sequence of the disease.[8]

It can be divided into four types (Fig. 1). There are as follows:

1. Type I: No fistula present
   - Type IA—presence of the cystic duct
   - Type IB—obliteration of the cystic duct
2. Types II-IV: Fistula present
   - Type II—defect smaller than 33% of the CBD diameter
   - Type III—defect 33 to 66% of the CBD diameter
   - Type IV—defect larger than 66% of the CBD diameter.

Mirizzi's syndrome has no consistent or unique clinical features that distinguish it from other more common forms of obstructive jaundice. Symptoms of recurrent cholangitis, jaundice, right upper quadrant pain, generalized body itch, elevated serum bilirubin and serum alkaline phosphatase may or may not be present. Acute presentations of the syndrome may include features of pancreatitis and cholecystitis.

Mirizzi's syndrome is therefore a form of obstructive jaundice caused by a stone impacted in the gallbladder neck or the cystic duct that impinges on the common hepatic duct with or without a cholecystocholedochal fistula. This syndrome is a rare complication of cholelithiasis that accounts for 0.1% of all patients with gallstone disease.[2] Preoperative recognition is necessary to prevent injury to the common duct during surgery.

OBJECTIVES

The objectives of this study were to review the medical literature available on the efficacy and safety of laparoscopic surgery in the management of Mirizzi's syndrome.

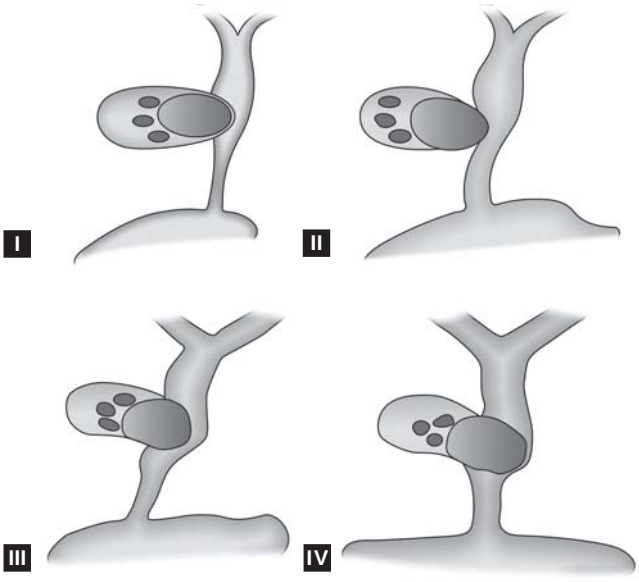

Fig. 1: Schematic representation of Csendes classification for Mirizzi's syndrome[4]

METHODS

Review of literature using the SpringerLink, Google and PubMed searches was performed and in total 148 citations were elicited. Selected papers were screened for further references. Other than papers in English, no other criteria for selection of literature was used due to the small number of articles on the syndrome.

FINDINGS/RESULTS

The difficult surgical management of MS is due to the presence of an intense fibrotic process and/or communication between the gallbladder and the common hepatic duct. Since laparoscopic cholecystectomy became a routine procedure in the early 1990s, only a few studies have been published describing their experience with the laparoscopic technique for the treatment of MS.[9]

M Schafer et al sampled 13,033 patients undergoing LC between 1995 and 1999 and only 39 (0.3%) had MS. A total of 74% had type I MS (24/39) and five had type II MS (5/39). They concluded that MS is rarely encountered and it must be recognized intraoperatively. They noted that it sometimes coexists with carcinoma of the gallbladder (4/39) 11% and overall conversion rates were 74% (24/34) for type I and 100% (5/5) for type II.

Sushil K et al concluded that if not recognized preoperatively, MS can result in significant morbidity and mortality. Preoperative diagnosis may be difficult despite the availability of multiple imaging modalities. Ultrasonography (US), CT, and magnetic resonance cholangiopancreatography (MRCP) are common initial tests for suspected Mirizzi's syndrome (Fig. 2). Typical findings on US suggestive of Mirizzi's syndrome are a shrunken gallbladder, impacted stone(s) in the cystic duct, a dilated intrahepatic tree, and common hepatic duct with a normal-sized common bile duct.[5] The main role of CT is to differentiate Mirizzi's syndrome from a malignancy in the area of porta hepatis or in the liver (Fig. 3). MRI and MRCP are increasingly playing an important role and have the additional advantage of showing the extent of inflammation around the gallbladder that can help in the differentiation of Mirizzi's syndrome from other gallbladder pathologies such as gallbladder malignancy.[7]

In a retrospective analysis of 4800 cholecystectomies, Thegeela et al found Mirizzi's syndrome in 133 (2.8%). Seven (5.3%) patients with Mirizzi's syndrome had associated gallbladder carcinoma (GBC), as compared to only 1% in patients with gallstone disease (GSD). GBC was detected on final histology after cholecystectomy in five patients, and was detected preoperatively and intraoperatively in one patient each. Patients with Mirizzi's syndrome with associated GBC were older (60 *vs* 50 years) and had a longer duration of symptoms as compared to those with Mirizzi's syndrome alone. However, presenting clinical features were not different in these two groups of patients.

They concluded that there was a higher incidence of GBC in patients with Mirizzi's syndrome than in patients with uncomplicated GSD. There were no clinical features to differentiate these patients with GBC from those with Mirizzi's syndrome alone, except that they were a decade older and had a longer duration of symptoms. In the majority, the diagnosis of GBC was made on final histology, after cholecystectomy; hence, this group of patients with GBC are to be treated like any other patients with incidental GBC.

Endoscopic retrograde cholangiopancreatography (ERCP) is the gold standard in the diagnosis of Mirizzi's syndrome. It delineates the cause, level, and extent of biliary obstruction, as well as ductal abnormalities, including fistulation. ERCP also offers a variety of therapeutic options, such as stone extraction and biliary stent placement.

Percutaneous cholangiogram can provide information similar to ERCP; however, ERCP has an additional advantage of identifying a low-lying cystic duct that may be missed on percutaneous cholangiography. Wire-guided intraductal US can provide high-resolution images of the biliary tract and adjacent structures. The diagnosis is difficult and it is more accented in third world countries where access to diagnostic techniques is limited or nonexistent. A preoperative diagnosis is therefore made in 8 to 62.5% of all patients.[6]

Treatment is primarily surgical. Laparoscopic surgery is the standard for MS type I and II and open surgery for managing patients with types III and IV. Good short-and long-term results with low mortality and morbidity have been reported in a number of studies with overall complication rates of about 18% with open surgical management.

Laparoscopic management is contraindicated in many patients because of the increased risk of morbidity and mortality associated with this approach. Endoscopic treatment may serve as an alternative in patients who are poor surgical candidates, such as elderly patients or those with multiple existing

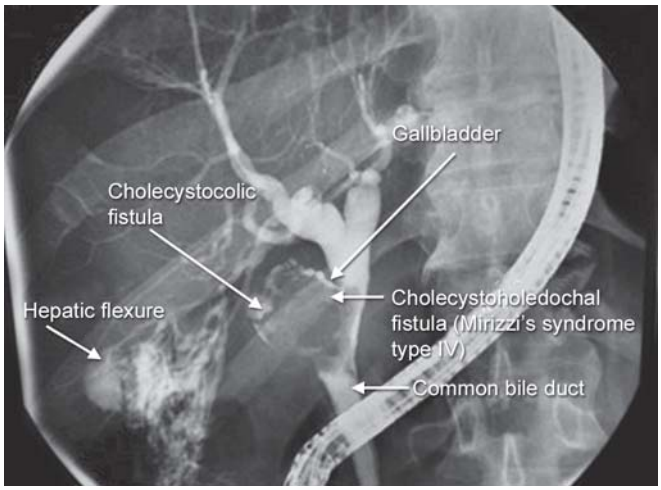

Fig. 2: MRI—T1 and T2-weighed images with iv contrast gadolinium-Bopta, revealing fistulous tract between the right colonic flexure and gallbladder (cholecystocolic fistula) and a large gallstone (2 cm)

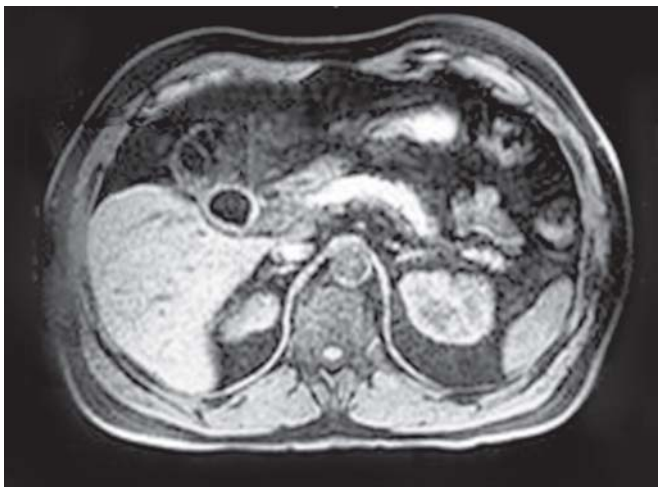

Fig. 3: Spiral CT with evidence of pneumobilia and suspicion of cholecystocolic fistula

comorbidities. Endoscopic treatment also can serve as a temporizing measure to provide biliary drainage in preparation for an elective surgery.

Mirizzi's syndrome is a rare condition, but surgeons must be aware of it. Surgical approach to MS in the 'laparoscopic era' may be complicated by the presence of a cholecystobiliary fistula and in these cases dissection of the Calot's triangle may be difficult or impossible. When an attempt to expose Calot's triangle may lead to severe bile duct injury, such as:

i. Iatrogenic communication between the gallbladder and CBD
ii. Complete transection of CBD after dissection of the gallbladder neck
iii. Tear of CBD.

CONCLUSION

From the literature reviewed, it appears that the outcome of laparoscopic treatment of MS is not inferior to that of open surgery, but it carries a significant conversion rate.[8] If MS types III and IV are suspected, then the 'open' approach is preferable, also for the reconstruction of biliary tree.

Removal of the gallbladder with commencement of dissection at the fundus is well recognized as a safe technique during difficult 'open' cholecystectomy because it minimizes the risks of damage to the structures in or around Calot's triangle[9] and has been recommended by many authors for laparoscopic cholecystectomy for MS types I and II.

The literature reviewed revealed that the papers were all case reports or case series and therefore a randomized controlled study comparing the open with the laparoscopic approach is currently lacking in the surgical literature.[8]

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