

# Mirizzi Syndrome Complicating Acute Cholecystitis: CT Diagnosis

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## Abstract

Mirizzi syndrome is a rare complication of gallstones with an incidence of less than 1% per year in Western countries. Imaging and endoscopy play a key role in its diagnosis. CT scan helps to eliminate any malignant lesion of the bile ducts or liver hence comes in handy in the confirmation of Mirizzi syndrome. We hereby report a case of a Mirizzi syndrome complicating acute cholecystitis in a 41-year-old patient without any history of disease.

## Keywords

Mirizzi Syndrome, Acute Cholecystitis, CT Scan

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## 1. Introduction

Mirizzi syndrome constitutes a rare complication of gallstones. It presents as a case of jaundice due to an extrinsic compression of the common bile duct (CBD): either by an obstructed cystic duct or a calculus obstructing the gallbladder neck. This may lead to either a partial or complete obstruction the bile duct due to underlying local inflammation hence responsible for angiocholitis and could even simulate neoplastic obstructive jaundice. Its incidence varies between 0.7% and 1.8% among cholecystectomy patients [1] [2]. We hereby report a case of a Mirizzi syndrome complicating acute cholecystitis in a 41-year-old patient without any history of disease.

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## 2. Case Report

A 41-year-old patient without significant clinical history presented to the emergency ward with jaundice and fever. Symptoms dated back to about 10 days prior to his consultation with the onset of Right upper quadrant (RUQ) pain complicated three days later with jaundice and fever. Physical examination found a 39°C febrile patient with 96 HR, a clearly visible jaundice and RUQ tenderness.

Laboratory tests showed 13500/mm<sup>3</sup> leukocytosis and C-reactive protein level at 148 mg/l, total bilirubin 177; 150 direct bilirubin, Gamma Glutamyl Transferase (GGT): 611; Alkaline phosphatase (ALP): 790; Liver enzymes: Glutamic oxaloacetic transaminase (GOT): 241; glutamic pyruvic transaminase (GPT): 259. The rest of the laboratory tests were unremarkable.

Abdominal ultrasound revealed a stone in the gallbladder with thickened wall and upstream common bile duct and intra hepatic bile ducts dilatation with no visible extra hepatic biliary duct obstacle.

Abdominal CT with contrast medium injection showed a distended gallbladder with thickened wall containing two stones: one enclosed within the cystic duct compressing the common bile duct with an upstream biliary dilatation (**Figure 1** and **Figure 2**).

The patient benefitted from emergent surgery with per-operative discovery of a gallstone stuck in the cystic duct. Cholecystectomy was performed and a Kehr T tube was inserted in the common bile duct. Immediate post-operative recovery was uneventful. The patient was discharged 5 days after surgery with favorable outcome:



**Figure 1.** Abdominal CT axial section showing gall stone impaction in the cystic duct and a distended gallbladder with thickened wall containing calculus compressing common bile duct and responsible for upstream bile duct dilatation.



**Figure 2.** Abdominal CT coronal section after contrast medium injection revealing calculus impaction in the cystic duct with compression of common bile duct and upstream biliary duct dilatation.

cholangiography through T tube was performed after 15 days and came back normal. Tube was removed at day 18 after having being clamped for 48 hours.

### 3. Discussion

Mirizzi syndrome is a rare pathological entity in the West with an incidence of less than 1% per year [3]. However, in developing countries, especially in Latin America, Mirizzi syndrome remains a common occurrence, with an incidence ranging from 4.7% to 5.7% [4] [5]. It affects women aged between 53 to 70 years. However this can affect patients of all ages with gallstone [5].

Mirizzi syndrome typically presents as: a long cystic duct parallel to the common hepatic duct and a gallstone impaction in bladder neck or cystic duct resulting in extrinsic compression of common bile duct and subsequent cholangitis.

Mc Sherry in 1982 [6] proposed two variants of the syndrome described as follows

- Type I: simple external compression of the common hepatic duct (typical Mirizzi syndrome);
- Type II: external compression associated with cholecysto-choledochal fistula.

Csendes in 1989 [7], after carefully studying 219 cases, described 4 types

- Type 1: external compression of the common bile duct;
- Type 2: cholecystobiliary fistula affecting less than one-third of the circumference of the bile duct;
- Type 3: fistula involving up to two-thirds of the circumference of the bile duct;
- Type 4: fistula with complete destruction of the wall of the bile duct.

Mirizzi syndrome often presents in an acute form. Chronic forms exist even though clinical presentation remains nonspecific. Typically, it presents as obstructive jaundice (60% - 100%), accompanied by right upper quadrant pain (50% - 100%) with fever suggestive of acute cholangitis [3].

Laboratory tests reveal an increase in total bilirubin with elevation of liver enzymes notably amino-transferase. In severe cases lab tests may reveal an infectious syndrome.

Preoperative diagnosis of Mirizzi syndrome is made based on imaging and endoscopic investigations.

Ultrasound shows a distended gallbladder with a thickened or normal wall and the presence of one or more stones in the infundibulum [8]. The common bile duct is dilated with or without intra hepatic duct dilatation [3]. Positive diagnosis of Mirizzi syndrome on ultrasound may be achieved in 29% of cases [9].

CT may reveal a calculus wedged in the cystic duct. The main utility of computed tomography would be the exclusion of any malignancy of the bile ducts or liver [3]

The MRI clearly shows the presence of gallstones or otherwise in cystic duct and associated dilatation of the common bile duct with or without intra hepatic bile duct dilatation [3]. It is very useful as it is non invasive hence avoiding complications associated with endoscopic cholangiography (ERCP) [10].

Endoscopic retrograde cholangiopancreatography is the first choice imaging technic in its positive diagnosis [6], as it allows more precise anatomical and topographical description of the bile ducts, but is not free of complications such as sepsis and pancreatitis, with a bile duct catheterization failure reported in 5% to 10% of cases [11].

Treatment of Mirizzi syndrome in cases where bile duct is inflamed without biliary fistula (Type I) entails cholecystectomy. Many surgeons contend that laparoscopic cholecystectomy is contraindicated in type VMirizzi syndrome while others consider laparoscopic approach feasible, though technically demanding [12]. Common hepatic duct almost always returns to normal state after the obstructing calculus has been removed by cholecystectomy and local inflammatory process resolved. Rarely a well-established stricture presents months to years after the acute episode. In such cases, stricture repair of the distal bile duct is indicated for persistent strictures using either Roux-en-Y choledocho-jejunostomy or choledocho-duodenostomy. If cholecysto-choledochal fistula is present, partial cholecystectomy, over sewing the gallbladder cuff and insertion of a T-tube through the fistula is widely regarded as adequate treatment for Type 2 Mirizzi syndrome [13]. Baer *et al.* [14] suggested the insertion of a T-tube through a separate choledochotomy in the distal CBD in order to prevent excessive leakage and stricture at the fistula site. The presence of CBD stones, fistula, or stenosis at the site of impaction of the stone may necessitate CBD exploration and/or the insertion of a T-tube. Choledocho-duodenostomy for Type 3 forms, and biliary bypass (Roux-en-Y hepatico-jejunostomy) for Type 4 MS are the surgical treatment procedures. In all cases, a frozen section of the gallbladder wall should be done to rule out coexistent cancer.

The prognosis of MS is very favorable for type 1 lesions; as simple cholecystectomy is all that is necessary as

treatment. Severe types with fistulous destruction of the common duct, postoperative morbidity increases to more than 10%, since biliary fistulae and biliary structuring require dilation or reoperation while liver abscesses may require drainage [15].

#### 4. Conclusion

Mirizzi syndrome is a rare entity. Its preoperative positive diagnosis is achieved using ERCP and sometimes, even more rarely so, MRI and CT play a pivotal role alongside the former.

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