

# NEW DIAGNOSTIC METHODS AND APPROACHES TO THE TREATMENT OF MIRIZZI SYNDROME

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Abstract:	Keywords
<p>Mirizzi syndrome is a rare cause of obstructive jaundice characterized by a depressed gallstone in the cystic duct or neck of the gallbladder with concomitant inflammatory changes causing external compression narrowing of the common hepatic duct and dilatation of the proximal bile ducts. This article discusses new diagnostic methods and approaches to the treatment of Mirizzi syndrome.</p> <p><b>Objective.</b> Conduct a systematic review of the sources of the current scientific literature.</p> <p><b>Materials and methods of research.</b> An analysis of 18 sources of foreign literature on this topic is carried out.</p> <p><b>Result.</b> In diagnosing Mirizzi syndrome, ultrasound is the most commonly used method of initial diagnosis. Magnetic resonance cholangiopancreatography (MRCP) and endoscopic retrograde cholangiopancreatography (ERCP) are good methods and equally effective, but only the latter can be therapeutic at the same time. Some modern methods show very high sensitivity,</p> <p>But they are not used as often. Mirizzi syndrome is still a diagnostic problem, despite improvements in available tools. Preoperative diagnosis is crucial to avoid complications during treatment. New research could lead to the unification of classifications and diagnostic algorithms.</p>	<p>Mirizzi syndrome, hepaticocholedoch, cystohepaticobiliary fistula, computed tomography, retrograde cholangiopancreatography.</p>

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**Introduction**

Mirizzi syndrome is a rare and difficult clinical condition to treat. However, recent advances in technology have opened up new opportunities for surgeons to diagnose and treat the condition more effectively. Laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstones. A gallstone that is outside the gallbladder or has formed in a nearby organ that needs further treatment can be difficult to treat safely or effectively with a laparoscopic approach. Pablo Luis Mirizzi (1893-1964), an Argentine surgeon, described Mirizzi syndrome (MS) in 1948; A rare disease that occurs in about 1% of all cholecystectomies and affects about 0.1% of all patients with cholelithiasis [1]. Mirizzi syndrome develops when a gallstone enters the neck of the gallbladder or the cystic duct, causing compression of the common bile duct or common hepatic duct, resulting in obstruction with or without jaundice and may progress to a cholecystocutaneous fistula. The obstructive biochemical picture may be caused by direct external compression from the affected gallstone or by fibrosis caused by progressive chronic cholecystitis. It can also occur in post-cholecystectomy patients with a long cystic duct remnant containing stones. Detecting Mirizzi syndrome before surgery will allow for careful planning of the surgical procedure and reduce concomitant morbidity. In addition, gallbladder cancer shares some common clinical and radiographic features and can coexist [2] with Mirizzi syndrome, which creates an additional challenge and highlights the importance of a detailed preoperative evaluation, whenever possible, before starting surgery in such cases. Often, MS is only diagnosed during surgery, which increases the percentage of access conversion and the risk of injury to the common bile duct [11]. The main clinical manifestations of MS are right upper quadrant pain, jaundice, and fever as a result of concomitant cholangitis [4]. In practice, it is difficult to isolate the clinical symptoms that distinguish this syndrome from others that occur in obstructive jaundice.

Differential diagnosis is made with diseases and conditions such as choledocholithiasis, common bile duct cancer, gallbladder cancer, pancreatic cancer, pseudotumorous pancreatitis, compression of the common bile duct by metastatic lymph nodes, sclerosing cholangitis, etc. [3]. Diagnostics of MS is developing in parallel with the progress of technical equipment of medicine. If the origin of the description of the syndrome was only intraoperative cholangiography, now all new technologies are coming to the aid of the surgeon. Ultrasound examination of the abdominal cavity is a routine method for detecting pathology of the pancreato-duodenal zone. This method is also a screening method for the detection of multiple sclerosis. However, according to various authors, the sensitivity of this method is quite low and ranges from 4 to 46% [9]. Ultrasound characteristics, such as a reduced gallbladder in the presence of dilated intrahepatic ducts with a normal size of the distal common bile duct, make it possible to suspect MS at the initial stage of the examination [16]. Methods of direct contrast enhancement of the bile ducts have been the standard in the preoperative diagnosis of MS for several decades.

Among them, endoscopic retrograde cholangiopancreatography (ERCP) is the most commonly used [3]. Hakim H. A. N. et al. (2020) indicate 100% sensitivity of this method

in diagnosis Hassan R. et al. (2019) believe that the differential diagnosis between compression of the proximal part of the common bile duct and its stricture is of great importance in the choice of the scope of surgery. To exclude the tumor nature, the authors propose to use a set of techniques consisting of endoscopic papillotomy performed for diagnostic purposes, instrumental revision of the biliary tract and selective cholangiography of the deformed part of the duct. At the same time, the authors emphasize that the use of In general, additional diagnostic techniques increase the invasiveness of the study, so the indications for their use should be limited. Other methods of direct contrast of the bile ducts, such as percutaneous transhepatic cholangiography (HCG), cholecystocholangiography, are less relevant in the diagnosis of MS due to their greater invasiveness. [13]. Despite the fact that ERCP plays a leading role in the preoperative diagnosis of MS, it should not be forgotten that approximately 6-22% of patients fail to cannulate the large duodenum.

It should not be forgotten that approximately 6-22% of patients fail to cannulate the large duodenal papilla or achieve visualization of the entire common bile duct [9]. In addition, there is a risk of severe complications such as pancreatitis, cholangitis, bleeding, and sepsis after ERCP and endoscopic retrograde papillosphincterotomy (ERST) [9,11].

In recent years, non-invasive methods of preoperative diagnosis of MS have been developed, such as spiral computed tomography and magnetic resonance cholangiopancreatography [7]. Budzinsky S.A. et al. (2019) in their work talk about the advantages of laparoscopic ultrasound of the pancreaticoduodenal area [7]. During surgery, if MS is suspected, this diagnostic method makes it possible to construct a multiplanar image of the bile ducts at different angles in real time, but it currently remains inaccessible and insufficiently studied.

In general, despite the variety of diagnostic methods, it is often not possible to diagnose MS before surgery. Such a situation during surgery can disorient the surgeon and create a risk of injury to the common bile duct, which is mistaken for the gallbladder or a wide cystic duct. Thus, the lack of universal preoperative methods of MS examination requires the development of optimal diagnostic tactics. In modern surgery, there are two main directions in treatment of MS: X-ray endoscopic methods, surgical interventions. X-ray endoscopic methods can be used at the first stage of surgical intervention as a preoperative preparation or as an independent method of treatment for patients with MS in case of high anesthetic risk [13]. According to the literature, the methods of operative access and surgical options for Mirizzi syndrome differ significantly: For example, some authors refer to This syndrome is an absolute contraindication to laparoscopic cholecystectomy [3,4].

However, there are a number of publications whose authors point to the possibility of using the laparoscopic technique under certain conditions. For example, Lai E. C. H. and Lau W. Y. (2006) indicate the possibility of using the laparoscopic approach by an experienced surgeon only in the first type of MS [17].

The most common surgery for the first type of MS is cholecystectomy, supplemented by drainage of the common bile duct [4]. In the presence of a biliary fistula, it is necessary to separate it with the subsequent restoration of the integrity of the common bile duct. One of

the options used by most surgeons to close a common bile duct defect is to repair the defect of the common bile duct wall with a specially left part of the gallbladder [4, 12]. Pugaev A.V. et al. (2019) in the presence of cholecystobiliary fistula, it is recommended to perform plastic surgery of the common bile duct with temporary stents. The authors explain the need for temporary stenting by the presence of long-term inflammatory changes in the area of the hepatoduodenal ligament, which is why MS can be considered as a "model of bile duct damage". There is a high risk of intra- and postoperative complications during MS surgery [3,4]. Preventing gallstones requires a diet high in fiber but low in fat, refined carbohydrates, and sugar. Slow weight loss is important in obesity because rapid weight loss can exacerbate the formation of gallstones. In addition to maintaining a healthy weight through lifestyle and diet changes, sometimes drug therapy is used to treat a single symptomatic gallstone [15].

Complications of gallstones are numerous and can affect the gallbladder, biliary tract, and intestinal tract. Symptomatic gallstones can cause acute or chronic cholecystitis, empyema, perforation, pericholecystic abscess formation, adenocarcinoma, ascending cholangitis, obstructive jaundice, Mirizzi syndrome, cholelithiasis, and Bouveret syndrome [18]. Over time, inflammation can cause cutaneous fistulas, secondary biliary cirrhosis, biliary strictures, and even death [14]. The greatest difficulty for surgical treatment is presented by patients with significant destruction of the wall of the common bile duct. It has been noted that the higher the degree of destruction of the wall of the common bile duct (type III-IV MS according to C.K. McSherry et al., 1982), the higher the level of postoperative mortality [4]. In type III-IV MS, most surgeons adhere to the position that choledochojunostomy is necessary.

Thus, today MS is one of the complications of cholelithiasis, in the diagnosis and surgical tactics of which there are a number of unresolved issues. Mirizzi syndrome is still a diagnostic problem, despite improvements in available tools. Preoperative diagnosis is crucial to avoid complications during treatment. MS in a patient during surgery increases the risk of intra- and postoperative complications. Difficulties in diagnosing Mirizzi syndrome, the danger of damage to the bile duct, a small number of observations, as well as a fairly wide range of surgical treatment methods determine the relevance of studying this problem.

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