

Current Trends in the Management of Mirizzi Syndrome: A Review of Literature

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ABSTRACT

The article describes modern methods of diagnosis and treatment of Mirizzi Syndrome. Despite a wide range of surgical methods for treating this syndrome, the results of treatment to date remain not entirely satisfactory. The presence of Mirizzi Syndrome in a patient during surgery increases the risk of intra- and postoperative complications. Difficulties in diagnosing Mirizzi syndrome, the risk of damage to the bile duct, several observations, as well as a fairly wide range of surgical treatment methods determine the relevance of studying this problem. The introduction of modern methods for diagnosing MS and the development of rational surgical tactics, depending on the type of syndrome, will make it possible to improve the treatment of patients with this complication of gallstone disease.

KEY WORDS: Mirizzi syndrome, bile ducts, diagnostics, computed tomography, retrograde cholangiopancreatography.

Kehr and Ruge were the first to describe this condition in the early 1900s, although the term “Mirizzi Syndrome” was not adopted until after the work of Mirizzi in 1948. This syndrome is an uncommon complication of chronic gallstone disease. Pathophysiologically, this condition involves extrinsic compression of the bile duct by pressure applied upon it indirectly by an impacted stone in the infundibulum or neck of the gallbladder. In turn, the resulting chronic inflammation and ulceration form varying degrees of cholecystobiliary fistula. Furthermore, cholecystoenteric fistula may also occur [9].

Mirizzi syndrome (MS) is one of the least understood concepts in bile duct surgery. This is due to the rarity of this pathology. This disease occurs according to the literature, from 0.5 to 5% among all patients operated on for gallstone disease [6, 12, 13, 17]. In connection with the progress of biliary tract surgery, an increase in the incidence of cholelithiasis, interest in this problem has increased in recent years. However, there is still no consensus on the diagnosis and tactics of surgical treatment [1, 2, 7, 15]. MS is often diagnosed only during surgery, which increases the percentage of access conversion and the risk of trauma to the common bile duct [9, 18, 32].

The main clinical manifestations of MS are pain in the right hypochondrium, jaundice and fever as a result of associated cholangitis [4, 8, 12]. It is practically difficult to isolate the clinical symptoms that distinguish this syndrome from others that occur with obstructive jaundice. Differential diagnosis is carried out with such diseases and conditions as choledocholithiasis, common bile duct cancer, gallbladder cancer, pancreatic cancer, pseudotumorous pancreatitis, compression of the common bile duct with metastatic lymph nodes, sclerosing cholangitis, etc. [3, 18]. Diagnosis of MS is developing in parallel with the

progress of technical equipment in medicine. If at the origins of the description of the syndrome is only intraoperative cholangiography, now all new technologies are coming to the aid of the surgeon. Ultrasound examination (ultrasound) of the abdominal cavity is a routine method for detecting pathology of the pancreato-duodenal zone. This method is also a screening method for MS. But, according to different authors, the sensitivity of this method is quite low and varies from 4 to 46% [7, 8, 20, 21, 25]. Such characteristics according to the results of ultrasound, such as a shrunken gallbladder in the presence of dilated intrahepatic ducts with a normal size of the distal common bile duct, allow one to suspect SM at the initial stage of the examination [16, 20].

Methods of direct contrast enhancement of bile ducts have been the standard in preoperative diagnosis of MS for several decades. Among them, the most commonly used endoscopic retrograde cholangiopancreatography (ERCP) [1, 5, 7]. Hakim H. A. N. et al. (2020) indicate 100% sensitivity of this method in the diagnosis of 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 for the choice of the scope of the operation. To exclude the tumor nature of the disease, 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 additional diagnostic techniques in general increases the invasiveness of the study, and therefore the indications for their implementation must be limited. Other methods of direct contrasting of the bile ducts, such as percutaneous transhepatic cholangiography (PTSC), cholecysto-cholangiography, are less relevant in the diagnosis of MS due to their higher invasiveness. In addition, when performing PTCG, difficulties arise in visualizing the distal common bile duct due to an obstacle located above [13, 14].

Despite the fact that ERCP plays a leading role in the preoperative diagnosis of SM, 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 [1, 7]. Also, after ERCP and endoscopic retrograde papillosphincterotomy (EPST), there is a risk of severe complications such as pancreatitis, cholangitis, bleeding, and sepsis [7, 9, 30]. And although the likelihood of them is quite low, nevertheless, the risk of performing ERCP can be life-threatening. All this forces researcher to look for new, effective and safer methods. In recent years, non-invasive methods of preoperative diagnosis of MS, such as spiral computed tomography, magnetic resonance cholangiopancreatography, have been developing [9, 12, 29]. Nagakawa T. et al. (1997) note that computed tomography (CT) does not provide any additional information in comparison with abdominal ultrasound or ERCP [21]. Only 79% of stones that are detected in the gallbladder by ultrasound can be visualized with CT [31]. However, this research method plays a significant role in the differential diagnosis with cholangiocarcinoma, gallbladder cancer, compression of the common bile duct by metastases in the hepatic hilus [9, 20]. There is another point of view on this research method. Nagakawa T. et al. (1997) in their work noted the high sensitivity, specificity and accuracy, 93%, 98% and 94%, respectively, of spiral computed tomography after performing infusion cholangiography.

Magnetic resonance cholangiopancreatography is a new and still poorly studied method for diagnosing MS. A number of authors consider this research method as the most promising for the verification of this syndrome [9, 21]. E.C.H. Budzinskiy S. A. et al. (2019) in their work talk about the advantages of laparoscopic ultrasound of the pancreatoduodenal region [9]. During surgery, if MS is suspected, this diagnostic method allows real-time construction of a multi-plane

image of the bile ducts at different angles, but at present it 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 the operation can disorient the surgeon and create the danger of injury to the common bile duct, mistakenly considered to be the gallbladder or a wide cystic duct. Thus, the lack of universal preoperative methods for examining MS calls for the development of optimal diagnostic tactics. There are two main directions in the treatment of MS in modern surgery: X-ray endoscopic methods, surgical interventions. X-ray endoscopic techniques can be used as the first stage of a surgical procedure as a preoperative preparation or as an independent method of treating patients with MS in the case of a high anesthetic risk [2, 11]. Among the disadvantages of REV, the authors distinguish the following: radiation exposure to patients and staff; high cost of endoscopic and X-ray equipment; the impossibility of eliminating the narrowing of the lumen of the proximal common bile duct [2, 24, 28].

According to the literature, the methods of operative access and options for operations in Mirizzi syndrome vary greatly: for example, some authors attribute this syndrome to absolute contraindications to laparoscopic cholecystectomy [1, 2, 13]. Lledó J. B. et al. (2014) in a review of the literature on the use of the laparoscopic technique in MS indicates 40% conversion of access, 20% of complications, and 6% of reoperations [19]. However, there are a number of publications, the authors of which indicate the possibility of using the laparoscopic technique under certain conditions. So, Lai E. C. H., 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 operation for the first type of MS is cholecystectomy, supplemented by drainage of the common bile duct [2, 17, 18]. 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. As one of the options for closing the common bile duct defect, used by most surgeons, is the elimination of the common bile duct wall defect with a specially left part of the gallbladder [2, 10, 15, 30] However, Waisberg J. et al. (2005) suggest that it is theoretically logical that the retained gallbladder tissue may increase the risk of developing residual choledocholithiasis [28].

Pugaev A. V. et al. (2019) in the presence of a cholecystobiliary fistula, it is recommended to perform plasty 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, due to which MS can be considered as a "model of damage to the bile ducts." With significant damage to the wall of the common bile duct involved in the fistula, a number of surgeons indicate the need to form a biliodigestive anastomosis: choledocho-duodenoanastomosis, choledocho-jejunoanastomosis, cholecysto-choledochojejunoanastomosis [22, 23].

During operations for MS, there remains a high risk of developing intra- and postoperative complications [1, 2, 6]. The most common complication after surgery for MS is stricture of the common bile duct. According to Zhang J., Perera P., Beard R. (2020) of 46 patients operated on with MS, stricture of the common hepatic duct developed in 6.5%. The results of operations on the so-called lost drainage, performed in four patients with the first form of MS ("stenosing" form), Vorobey A. V. et al. (2018) is rated as positive [27]. However, the reasons for the removal of drains from the ducts are immediately given, such as the development of jaundice, obstruction of the drains caused by the formation of small stones, the deposition of salts on the walls of the drainages and the accumulation of putty detritus, which leads to repeated

attacks of cholangitis. The greatest difficulty for surgical treatment is presented by patients with significant destruction of the common bile duct wall. It is noted that the higher the degree of destruction of the common bile duct wall (III – IV type MS according to C.K. McSherry et al., 1982), the higher the level of postoperative mortality [2, 6, 26]. In type III – IV MS, most surgeons adhere to the position of the need to apply choledochojejunostomy.

Thus, today MS is one of the complications of gallstone disease, in the diagnosis and surgical tactics of which there are a number of unresolved issues. Despite a wide range of surgical techniques for this syndrome, the results of treatment to date are not entirely satisfactory. The presence of MS in a patient during surgery increases the risk of intra- and postoperative complications. Difficulties in diagnosing Mirizzi's syndrome, the danger of damage to the bile duct, few observations, as well as a fairly wide range of surgical treatment methods determine the relevance of studying this problem. The introduction of modern methods for diagnosing MS and the development of rational surgical tactics, depending on the type of syndrome, will make it possible to improve the treatment of patients with this complication of cholelithiasis.

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CONFLICT OF INTEREST

The authors declare that they have no competing interests.

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