

CLINICAL RESEARCH

Surgical Tactics for Mirizzi's Syndrome

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Abstract

Surgery performed when there are urgent indications is still the main treatment method for patients with Mirizzi's syndrome (MS). However, surgical correction often leads to the development of a post-operative stricture of the hepaticocholedoch, which requires complex reconstructive operative interventions at a later time. 93 patients (aged from 27 to 74 years) with MS were treated during 8 years. According to the presence of obstructive jaundice (OJ), the treatment process of the patients was divided into two stages. The first stage started with performing endoscopic diagnostic and operative interventions as retrograde pancreaticocholangiography (RPCG) with endoscopic papillosphincterotomy (EPCT) and, in cases of inefficiency, the use of percutaneous-transhepatic cholangiostomy (PTChS) was applied. In 39 patients, due to the presence of severe concomitant pathology and high operative risk, the first treatment stage was the final one. Altogether, we operated on 54 patients in the second stage. The results obtained showed that the diagnostic process in patients with gallstones complicated by fistula must be complex, and the leading role should belong to endoscopic means of investigation with high indications of specificity, sensitivity, and general exactness. Operative interventions in patients with MS must be performed in two stages: in the first stage, decompression of the biliary system is performed; in the second stage, adequate bile passage into bowels is recovered.

Keywords: *Mirizzi's syndrome; gallstone disease; obstructive jaundice; two-staged surgical treatment retrograde pancreaticocholangiography*

Introduction

The morbidity rate of patients with gallstone disease (GD) has been rising in recent decades and continues to rise. The number of patients with complicated types of GD is increasing [1,2]. One of those complications is Mirizzi's syndrome (MS) followed by the formation of a cholecysto-biliary fistula (CBF) along with the development of obstructive jaundice (OJ) and purulent cholangitis (PCh) [1-5].

MS is a rarely diagnosed complication of GD. The frequency of MS varies from 0.25% to 4% among patients with GD. Theoretical aspects of MS development are not completely understood [3-5]. The absence of a single cause in the issues of etiopathogenesis leads to a different treatment

of morphological changes and complicates the generation of single tactical approaches.

Surgery performed when there are urgent indications is still the main treatment method for patients with MS. Operative interventions are performed for the most difficult cases in emergency surgery of the biliary tract, and lethality reaches as high as 13.3% [3-7].

High mortality rates result, in the first place, from the fact that in the post-operative period OJ and PCh existing in such patients often leads to the development and progression of liver and kidney failure; and in the second place, during surgical intervention there can be a serious danger of hepaticocholedoch injury due to severe morphological changes existing in the hepaticocholedoch [1,2,7].

Moreover, surgical correction of MS often leads to the development of post-operative stricture of hepaticocholedoch, which requires complex reconstructive operative interventions at a later time [8,10,11].

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Taking into account everything mentioned above, *the aim* of this investigation was to improve surgical treatment results of patients with Mirizzi's syndrome by upgrading the surgical treatment tactics.

Material and Methods

This research was based on the diagnostics and treatment results of 93 patients with MS types II–IV (A. Csendes, 1989), who were treated from 2004 to 2012. Informed consent was obtained from each patient. The study was approved by the Tashkent Medical Academy and the Republican Research Centre of Emergency Medicine Ethics Committees. In 22 (23.6%) observations there were patients with type II MS (between the gallbladder neck and hepaticocholedoch there was a fistula occupying less than one-third of the duct's circle); in 61 (65.6%) observations, patients had type III MS (the fistula occupied two-thirds of the duct's circle); and in 10 observations (10.8%), type IV (the hepaticocholedoch and gallbladder wall were totally ruptured). There were 29 (31.2%) male and 64 (68.8%) female participants in the study. Patients' ages varied from 27 to 74 years (mean age 41.3 ± 7.6 years).

All patients at admission were examined according to treatment-diagnostic standards of the Emergency Medicine Service of Uzbekistan. This examination included general clinical, laboratory and special instrumental investigations (ultrasound, multi-spiral computer tomography, MRI-cholangiography with direct opacification of the bile ducts).. The aim of those investigations was to estimate patients' general condition, and to determine the levels of intoxication and operative-anesthetic risk.

Results and Discussion

All examined patients at admission had OJ with a bilirubin rate from 45 up to 700 $\mu\text{mol/L}$. In 36 (38.7%) patients, there was a clinical sign of PCh.

According to the presence of OJ, the treatment process of the patients was divided into two stages. The first stage started with performing endoscopic diagnostic and operative interventions as retrograde pancreaticholangiography (RPCG) with endoscopic papillosphincterotomy (EPCT) and, in cases of inefficiency, the use of percutaneous-transhepatic cholangiostomy (PTChS) was applied. Reconstructive-recovery operations were performed at the second stage.

RPCG has been performed on all the patients. The analysis of RPCG in patients with MS revealed different features (Table 1).

Table 1.

The analysis of RPCG in patients with MS (n=93)

X-ray features	n	%
Location of a blocking stone in the middle one-third of hepaticocholedoch	62	66.7
Absence of dilatation of the choledoch thermal parts	38	40.9
Gallbladder shrinkage	9	9.7
Cystic duct shadow's absence	11	11.8
«Rejection» retrograde inputted catheter into gallbladder	1	1.1

The most frequent X-ray features detected by RPChG in investigated patients were location of a blocking stone in the middle one-third of the hepaticocholedoch (66.7%) and the absence of dilatation of the choledoch thermal parts (40.9%). Along with that finding, in 11 (11.8%) patients there was no shadow of the cystic duct at opacification and it was one of the reasons for the presence of CBF. We performed the following procedures for these patients: for 86 (92.4%) patients, EPST on the background of RPCG; in 3 (3.2%) patients, litho-extraction along with EPST; in 4 (4.3%) patients, nasobiliary drainage; in 2 (2.1%) patients, endobiliary stenting of the choledoch; and in 7 (7.6%) patients, PTCS. Due to these measures, in all patients the appearance of OJ and PCh was stopped, and favorable conditions for performing operative interventions at the second stage were created.

In 39 patients, due to the presence of severe concomitant pathology and high operative risk, the first treatment stage was the final one. Altogether, we operated on 54 patients in the second stage (Table 2).

Table 2.

Types of the performed surgical interventions (n=54)

Types of operations	n	%
Fistula closure	24	44.4
Hepaticocholedoch plasty	26	48.1
Fistula plasty with cystic duct formation	2	3.7
Hepaticojejunostomy (Roux Y-bypass)	2	3.7

The required point of surgical intervention was performing a cholecystectomy from the bottom of the gallbladder. In 24 observations where a small fistula was present, to perform a surgical intervention which would not lead to the stricture of the hepaticocholedoch lumen the fistula's hole was closed, with drainage of the common bile duct (Fig.1).

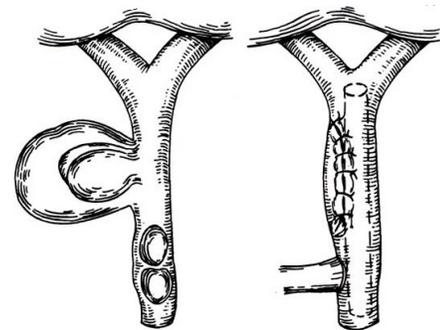


Fig. 1. Cholecystectomy, closure of the hole, choledoch drainage by Kerr (V.S.Savelyev, 2003).

In 26 cases where the fistula was large, there was a high risk of hepaticocholedoch lumen stricture if the fistula were closed, so we performed the plasty of the common bile duct. Meanwhile, the gallbladder was totally isolated from surrounding adhesion, keeping its wall to form a graft, which was used to close the fistula (Fig.2).

One of the deficiencies of the above-mentioned operative interventions is the necessity of performing an additional choledochotomy aside from the fistula's hole for

cholangiostomy. At the same time, performing an additional choledochotomy could cause inflammation to spread to the common bile duct interface, resulting in an increased risk of operational injury. Certainly, this procedure may have negative consequences in both the early and later post-operative periods. In the early post-operative period, suture failure of the choledochotomic wound with internal or external bilorrhea can occur, and in the later period, a choledoch stricture can form, along with formation of recurrent concrements. Taking into account everything mentioned above, in cases of MS with evident inflammatory process spreading to the major part of the common bile duct we have used in two patients a new improved surgical method of operation (Innovation №00004 dated by 20.02.2012).

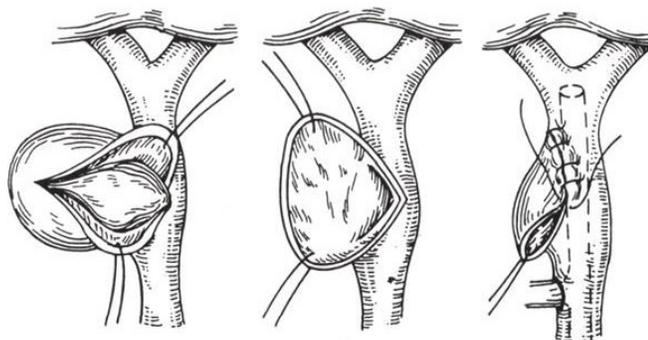


Fig. 2. Subtotal cholecystectomy, fistula plasty by graft formed from gallbladder wall and draining by T-shaped drainage (V.S.Savel'ev, 2003).

During the operative intervention, the gallbladder was isolated from surrounding tissues and adhesions. Then a resection of the gallbladder was performed, while keeping its upper wall and forming a graft from it to close the defect in the common bile duct wall. While closing the defect, a channel was formed through which the drainage of the common bile duct was accomplished by means of the Pikovskiy type of drainage (Fig.3).



Fig.3. Subtotal cholecystectomy, fistula plasty with cystic duct formation.

In two observations we performed a hepaticojejunostomy (Roux Y-bypass) when we managed to expose hepaticocholedoch along the proximal direction towards the bifurcation of the common bile duct where we exposed practically normal tissues of the duct in type IV MS (Fig.4).

Seventeen (31.4%) patients had post-operative complications (Table 3). Non-specific complications, such as suppuration of post-operative wounds, occurred in all patient groups with the same frequency.

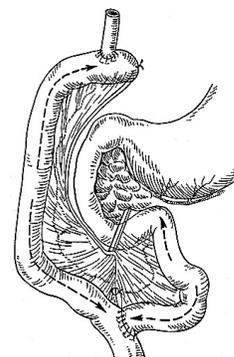


Fig. 4. Hepaticojejunostomy (Roux Y-bypass).

Table 3.

Frequency and nature of post-operative complications

Nature of complications	Fistula closure	HCP*	HCP* + cystic duct formation	Total
Suppurations of post-operative wound	4	6	-	10
Post-operative pneumonia		1	-	1
Progressing of hepatic failure	2	2	-	4
Sutures failure		1	-	1
Residual litiasis		1	-	1
Total	6	11	-	17

* HCP -Hepaticocholedoch plasty

Specific post-operative complications, like hepaticocholedoch suture failure, occurred in one case during the fistula closure and the plasty of hepaticocholedoch. There were no such complications in patients who had received hepaticocholedoch plasty by our method. Death was marked in 5 (9.3%) observations. The reasons for the fatal outcomes were these: in 2 (3.7%) cases, the progression of acute hepatic failure on the background of existing PCh; in 2 (3.7%) cases, acute cardiac infarction; and in 1 (1.9%) case, pulmonary embolism.

Therefore, the issue of treating patients with gallstones complicated by ChBF remains an active one, and needs further development.

Traditional surgical interventions applicable in these cases are traumatic, have many post-operative complications, and a high mortality rate.

In contrast, the approach to the choice of MS surgical correction that we offer allows avoidance of the majority of specific post-operative complications.

Conclusions:

1. The diagnostic process in patients with gallstones complicated by ChBF must be complex, and the leading role should belong to endoscopic means of investigation with high indications of specificity, sensitivity, and general exactness.

2. Treatment tactics for gallstones complicated by ChBF must be active and individual. Operative interventions in patients with MS must be performed in two stages: in the first stage, decompression of the biliary system is performed; in the second stage, adequate bile passage into bowels is recovered.

3. Special X-ray and endoscopic investigations must include gastroscopy with direct examination of big duodenal papilla, RPCG, EPST with lithotripsy and standard litho-extraction. These investigations allow not only detection of the presence of ChBF but location of its position in relation to external bile ducts.

4. The main task when performing endoscopic interventions in observed patients is to eliminate OJ and cholangitis by removing concrements or by naso-biliary drainage.

5. Methods of treatment for patients with gallstones complicated by ChBF formation must include different operative interventions: cholecystectomy, removal of concrements from the general bile duct, and recovery of its wall integrity with adequate bile passage into the bowels.

Competing interests

The authors declare that they have no competing interests.

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