American Journal of Medicine and Medical Sciences 2020, 10(1): 1-4
DOI: 10.5923/j.ajmms.20201001.01

Efficacy of Newer Surgical Treatment for Purulent Cholangitis

Z. B. Kurbanuyazov, K. B. Saidmuradov

Samarkand State Medical Institute, Samarkand, Uzbekistan

Abstract The study was conducted at the clinics of the Samarkand State Medical Institute. We observed 124 patients with cholelithiasis complicated by purulent cholangitis. Most of the patients were women - 95 (76.6%), men were 29 (23.4%). The average age of patients was 45.4 ± 7.3 years. All patients were divided into 2 groups. The comparison group was consisted of 56 patients who received traditional surgical treatment, the main – 68 patients who received the developed surgical treatment. Both groups of patients were approximately the same in age, severity of clinical manifestations and the severity of concomitant diseases. The duration of the biliary system diseases in most patients (78%) was more than 5 years. In the surgical treatment of patients with cholelithiasis complicated by purulent cholangitis, sanitation of the biliary tract with sodium hypochlorite solution helps to prevent the formation of intrahepatic cholangiogenic abscesses and the development of biliary sepsis. A two-stage surgical treatment with sanitation of the bile ducts was used for the successful treatment of patients with cholelithiasis complicated by purulent cholangitis. Endoscopic papillosphincterotomy with lithoextraction and installation of nasobiliary drainage for decompression of the bile ducts was performed as the first stage. Laparoscopic or minilaparatomic cholecystectomy was performed after improving the condition of patients. When the clinic of destructive cholecystitis prevailed, open cholecystectomy and choledocholithotomy were performed with the installation of a drainage tube in the choledoch. For the rehabilitation of the bile ducts in the postoperative period, a 0.06% sodium hypochlorite solution was introduced drop-by-drop through the installed drains. First, an anolyte solution of sodium hypochlorite with pH = 4 was introduced to normalize microflora, then a catholytic solution of sodium hypochlorite with pH = 8. This prevented the occurrence of microabscesses and abscesses of the liver and eliminated inflammation in the bile ducts. Our proposed method allows to stop attacks of cholangitis and favorably affects the postoperative period, helped to reduce postoperative complications from 32.1% to 22.05%, and mortality from 8.9% to 2.9%.

Keywords Purulent cholangitis, Bile duct sanitation, Microabscesses, Liver abscesses

1. Introduction

Cholangitis is a purulent inflammation of the bile ducts caused by the activation of bacterial microflora that has arisen against the background of the bile outflow violation and is observed in 17-83% of patients with cholelithiasis, Vater papilla stenosis, Mirizzy syndrome. In patients with post-traumatic bile duct strictures and cicatricial anastomotic constriction of biliodigestive anastomoses, cholangitis is detected in more than 80% of cases. Bacteriological studies of bile performed in these cases show that it is infected in 80-100.0% of cases. In this case, gram-negative microflora is most often detected: Escherichia coli, Proteus, blue-green pus bacillus, enterobacteria, etc. Coccal microflora or various associations of microorganisms are more rarely sown [1-5]. The main place in international scientific research on the problems of purulent cholangitis (PC) is occupied by the issues of expanding the medical and diagnostic capabilities of minimally invasive endobiliary technologies. According to many researchers view, a large selection of methods for the treatment of obstructive jaundice of benign origin (OJBO) should reduce the number of postoperative complications and increase the effectiveness of minimally invasive treatment [5-6].

Currently, with the development of non-invasive methods of radiation examination, the use of endoscopic diagnostic techniques is fading into the background, as their implementation can provoke the development of complications such as acute pancreatitis and bleeding. A particular importance is now given to the widespread introduction of magnetic resonance cholangiography, the results of which should dictate further tactics of diagnosis and treatment [6-7]. The development of purulent cholangitis leads to a deterioration in the functional reserve of the liver, multiple organ failure and septic manifestations. These

Published online at http://journal.sapub.org/ajmms

patients require urgent decompression of the biliary tract with the inclusion of reasonable therapeutic measures. Accordingly, patients who have a high risk of surgical treatment should undergo minimally invasive biliary tract (BT) decompression before taking a radical intervention [6-8].

The main method of surgical treatment of patients with cholelithiasis complicated by purulent cholangitis is the earliest possible external decompression of the bile duct, by installing drainages and removing stones from the common bile duct [8-9]. It provides the outflow of infected bile to the outside, reducing the severity of obstructive jaundice and endogenous intoxication. Another important element in the treatment of purulent cholangitis is the early administration of antibiotic therapy in accordance with the sensitivity of bile microflora [8-10]. Surgeons prescribe antibiotics both before surgery for drainage of the bile ducts, and in the postoperative period. At the same time, the use of endobiliary administration of drugs as a supplement to them is also known [9-10]. Decompression of the bile ducts, antibiotic therapy and the addition of other antimicrobial effects to it do not exclude the occurrence of complications such as liver abscesses, liver failure and sepsis.

Aim of the study is to prove the efficacy of our developed new treatment method for the patients with purulent cholangitis.

2. Material and Methods

The study was conducted at the clinics of the Samarkand State Medical Institute. We observed 124 patients with cholelithiasis complicated by purulent cholangitis. Most of the patients were women - 95 (76.6%), men were 29 (23.4%). The average age of patients was 45.4 ± 7.3 years. All patients were divided into 2 groups. The comparison group was consisted of 56 patients who received traditional surgical treatment, the main – 68 patients who received the developed surgical treatment. Both groups of patients were approximately the same in age, severity of clinical manifestations and the severity of concomitant diseases. The duration of the biliary system diseases in most patients (78%) was more than 5 years. The features of surgical treatment of patients in both groups were as follows: the timing, type and extent of the surgery were selected based on the severity of acute cholecystitis signs, local or widespread peritonitis, the presence and severity of obstructive jaundice, signs of cholangitis, the age of patients, the severity of concomitant diseases and the general condition of patients. In case of destructive cholecystitis with peritonitis, emergency surgical interventions were performed after short-term preoperative preparation. During the preoperative preparation, patients received medications that correct the condition of the cardiovascular system, respiratory organs, kidneys, metabolic processes, as well as antibacterial agents, antispasmodics, detoxification drugs and others. At the same time, patients were examined and consulted by doctors of related specialties. The patients with signs of purulent cholangitis, in which obstructive jaundice increased or not decreased were operated urgently.

Our developed surgical treatment, in addition to the listed tactical and therapeutic measures, included:

- earlier performing urgent surgical interventions (in the nearest 1-2 days);
- the use of various combinations of minimally invasive surgical interventions and their phased implementation;
- overdrainage sanitation of biliary tracts.

Most often, the first stage of surgical treatment was the implementation of endoscopic palillosphincterotomy (EPST) with removal of stones from the common bile duct during choledocholithiasis and the installation of nasobiliary drainage (Fig. 1).

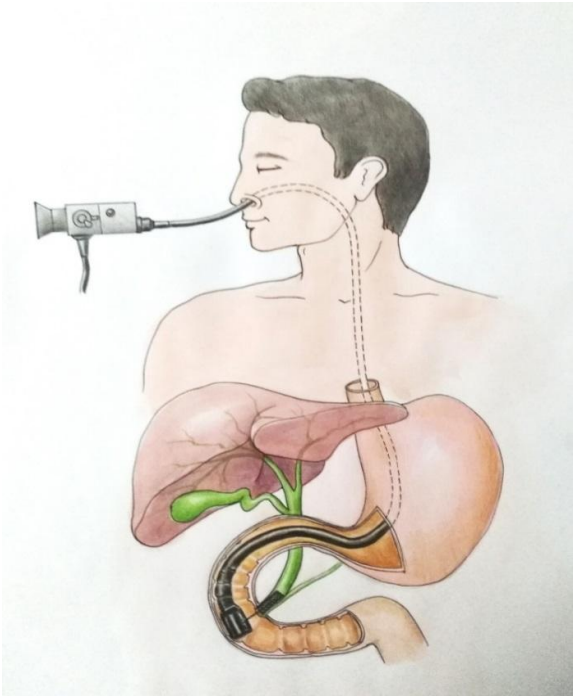

Figure 1. Scheme of extrahepatic bile ducts sanitation: nasobiliary drainage after EPST

Laparoscopic or minilaparatomic cholecystectomy was performed as the second stage. In the presence of severe inflammation of the gallbladder with signs of widespread or local peritonitis, as well as with unsuccessful lithoextraction at EPST, traditional cholecystectomy or cholecystectomy was performed through a mini-approach with choledocholithotomy and external choledoch drainage. In the main group of patients, in order to reduce inflammation in the bile ducts more quickly and prevent the formation of microabscesses or abscesses in the liver, BT was refurbished with a 0.06% sodium hypochlorite solution. First, an anolyte solution of sodium hypochlorite with pH = 4 was introduced to normalize microflora, then a catholytic solution of sodium hypochlorite with pH = 8. Such washing of the bile ducts was carried out for 7–8 days (BT sanitation plan is presented in Fig. 2).

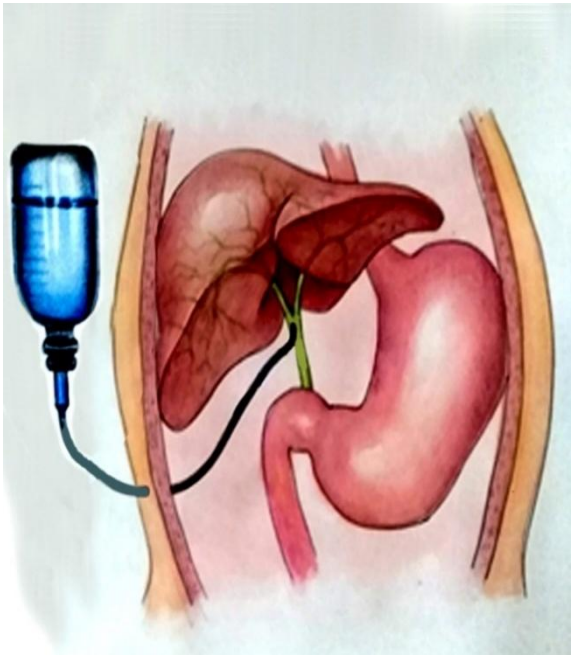

Figure 2. The scheme of extrahepatic bile ducts sanitation with sodium hypochlorite through Vishnevsky drainage

Sodium hypochlorite was prepared using an EDO-4 apparatus. The STEL-MT-1 apparatus was used to prepare the anolyte and catholyte solution. Sodium hypochlorite is a strong oxidizing agent and has a powerful bactericidal effect. Getting through the drainage into the intrahepatic ducts, it binds to bile, dilutes it and promotes the sanitation of the bile ducts, dramatically reducing the high titers of microbial bodies. Moreover, it is the "acidic" solutions of antibacterial agents (anolytes), in particular sodium hypochlorite, that have more evident disinfectant properties and a wide spectrum of antimicrobial activity.

As our studies showed, the introduction of 400 ml of a 0.06% sodium hypochlorite solution reduces the microbial titer in the bile culture, and it remains lowered the day after administration (data are presented in Tab.1).

Table 1. Periodic sanitation of the intrahepatic bile ducts

Type of microorganisms	Before introduction	After introduction	In a day
Kl. Pneumonie	10^{10}	$7.0x10^{2}$	$5.0x10^{2}$
E.coli	$5.0x10^{4}$	$4.0x10^{3}$	$4.0x10^{2}$
Candida	$1.3x10^{3}$	$5.0x10^{4}$	$3.0x10^{4}$
Enterobacter aerogenes	$1.0x10^{5}$	$6.0x10^{3}$	$2.0x10^{3}$

In addition, sodium hypochlorite solution is a donor of active oxygen. Once in the intrahepatic ducts, sodium hypochlorite releases active oxygen, which is not only easily distributed in the vascular bed, intercellular space, cell and oxidizes the toxic and ballast substances contained therein, but also promotes rapid regeneration. The use of sodium hypochlorite in a volume of 400 ml allows to adequately wash the intrahepatic ducts. The use of a catholytic solution of sodium hypochlorite promotes faster and softer regeneration, without the formation of a rough scar and the formation of the biliary tract stenosis. After receiving the sterile result of bacteriological culture of bile, the washing of the bile ducts was stopped, the drainage tube in the common bile duct or nasobiliary drainage was removed after 10-12 days.

3. Results and Discussion

In accordance with the described tactical approaches to treating patients, the following types of surgical interventions were performed in the group of people who received traditional surgical treatment and with the developed surgical treatment (Tab.2).

Table 2. Stages and types of surgical interventions in the traditional treatment of patients (n=56)

	Stages and types of surgical interventions	Control group	Main group
1.	Open cholecystectomy, choledocholithotomy, external drainage of the choledoch	26	12
2.	Stage 1: open cholecystectomy, external drainage of the common bile duct, drainage of the subhepatic space. Stage 2: endoscopic papillosphincterotomy with lithoextraction	4	
3.	Stage 1: LCE or MLCE, external drainage of the choledoch Stage 2: endoscopic papillosphincterotomy with lithoextraction	21	
4.	Stage 1: cholecystostomy Stage 2: drainage of the choledoch	5	2
	MLCE- + choledocholithotomy with external drainage of the choledoch		16
	Stage 1: EPST, NBD; Stage 2: LCE		29
	Stage 1: EPST, NBD; Stage 2: MLCE		9
Total		56	68

Note: LCE - laparoscopic cholecystectomy; MLCE-minilaparatomic cholecystectomy, NBD - nasobiliary drainage; EPST - endoscopic papillosphincterotomy.

The table shows that the main type of surgical intervention in the control group was open cholecystectomy, choledocholithotomy with intraoperative cholangiography, external drainage of the choledoch and drainage of the subhepatic space (26 surgeries). The same type of operation was performed at widespread peritonitis (4 surgeries), supplementing it with sanitation (washing) of the abdominal cavity and its drainage. To reduce the duration of the surgery, we were limited by external drainage of the common bile duct, postponing an X-ray examination of the extrahepatic bile ducts for the postoperative period. With the developed surgical treatment, operations were performed in 2 stages.

Minimally invasive surgeries include laparoscopic and minilaparatomic cholecystectomy (MLCE) with external drainage of the common bile ductcholedoch and subhepatic space as the first stage. The second stage was the implementation of endoscopic papillosphincterotomy with lithoextraction. The treatment results were judged by the number of postoperative complications and mortality (Tab.3).

Table 3. Postoperative complications and surgical treatment outcomes

	Types of postoperative complications	Control group		Main group	
		Quantity	Died	Quantity	Died
1.	Cholangiogenic liver abscesses, biliary sepsis	4	3	-	-
2.	Postoperative pancreatitis	2	-	3	1
3.	Continuous peritonitis	2	1	2	1
4.	Bleeding from a large duodenal papilla	1	-	2	-
5.	Bile leakage	3	-	4	-
6.	Hepatic-renal failure	4	1	3	-
7.	Acute cardiovascular failure	2		1	
Total		18 (32.1%)	5 (8.9%)	15 (22.05%)	2 (2.9%)

From the data presented in table 3, it is seen that the most formidable complications in the control group were: hepatic-renal failure, cholangiogenic liver abscesses with biliary sepsis, continuous peritonitis and acute cardiovascular failure, leading to a total of 5 (8.9%) deaths, moreover, 3 patients died after emergency surgeries, 2 – after urgent, performed in connection with the increase of jaundice and cholangitis. In the main group, postoperative complications developed in 15 (22.05%) patients and there were lethal outcomes in 2 (2.9%) cases. It should be noted that in connection with the use of minimally invasive technologies, postoperative complications – bleeding from the large duodenal papilla (2 cases) and postoperative pancreatitis (3 observations) were specific. Noteworthy is the absence of such life-threatening complications as cholangiogenic liver abscesses and biliary sepsis in this group of patients: it became possible due to the use of our proposed method of bile duct sanitation with electro-activated solutions of sodium hypochlorite in patients.

4. Conclusions

In the surgical treatment of patients with cholelithiasis complicated by purulent cholangitis, sanitation of the biliary tract with sodium hypochlorite solution helps to prevent the formation of intrahepatic cholangiogenic abscesses and the development of biliary sepsis.

REFERENCES

[1] Ustinov G.G. Cholangitis, cholangiogenic abscesses, cholangiogenic sepsis from the perspective of a systemic inflammatory response / Ustinov G.G. // In collection: XI congress of surgeons of the Russian Federation. - Volgograd-2011.-P.559-560.

[2] Ustinov G.G. Intravenous and endobiliary administration of sodium hypochlorite solution and low-energy laser irradiation in the treatment of acute purulent cholangitis / Ustinov G.G., Maryin A.V. // AllRussian Forum "Pirogov Surgical Week" .- SPb.-2010.-P.298-299.

[3] Dibirov M.D. The choice of treatment method for severe cholangitis and cholangiogenic sepsis in gallstone disease / Dibirov M.D., Perekhodov S.N, Rybakov G.S. et al. // In: XI Congress of Surgeons of the Russian Federation.-Volgograd. 2011.-P.515-516.

[4] Beburishvili, A.G. Residual and recurrent choledocholithiasis: ways to solve the problem / A.G. Beburishvili, M.I. Turovets, E.N. Zyubina, V.V. Mandrikov, Yu.I. Vedenin, M.V. Gerasimov // Materials of the III Congress of Surgeons of the South of Russia. - Astrakhan. - 2013.- P. 111.

[5] Koichuk R.A. Aspects of prevention of purulent-septic complications in acute purulent cholangitis / Koychuk R.A., Osmanov A.O.//In Sat: XI Congress of Surgeons of the Russian Federation.-Volgograd-2011.- P.522.

[6] Kulish, V.A. Comprehensive treatment of patients with cholangiogenic infection / Kulish V.A., Bochkareva I.V., Klyushnikov M.N.// In collection: XI congress of surgeons of the Russian Federation. -Volgograd-2011.- P.524-525.

[7] Bagnenko S.F. The modern concept of the treatment of acute cholangitis and biliary sepsis / S.F. Bagnenko, S.A. Shlyapnikov, A.Yu. Korolkov: materials of the conference “Actual problems of the organization of emergency medicine: issues of nasocomial infection in emergency medicine”, (2008, Samarkand). - P. 11-12.

[8] Rosing D.K. Cholangitis: analysis of admission prognostic indicators and outcomes / D.K. Rosing, C. De Virgilio, A.T. Nguyen [et al.] // Am. Surg. – 2007. – Vol. 73, № 10. – P. 949-954.

[9] Tseng L.J., Tsai C.C., Mo L.R. et al. Palliative percutaneous transhepatic gallbladder drainage of gallbladder empyema before laparoscopic cholecystectomy // Hepatogastroenterology. 2000. - Vol. 47, № 34. - P. 932936.

[10] Li V.K. Optimal timing of elective laparoscopic cholecystectomy after acute cholangitis and subsequent clearance of choledocholithiasis / V.K. Li, J.L. Yum, Y.P. Yeung // Am. J. Surg. - 2010. – № 4. – PMID: 20381787.