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SINGLE-STAGE SURGICAL TACTICS - AS A DIFFERENTIATED APPROACH IN THE TREATMENT OF ACUTE CHOLECYSTITIS IN COMBINATION WITH CHOLEDOCHOLITHIASIS

Resume: Stones of the common bile duct (choledocholithiasis) occur from 8% to 20% in patients with acute cholecystitis. This pathology requires solving the problem from the side of the gallbladder and the common bile duct at the same time.

Aim: Justification of effectiveness (hospital stay, frequency of complications, duration of anesthesia, laboratory data) of the use of single-stage surgical treatment tactics for acute cholecystitis combined with choledocholithiasis.

Research methods: We retrospectively analyzed the medical histories of 135 patients who underwent endoscopic retrograde cholangiopancreatography, papillosphincterotomy with choledocholith extraction followed by laparoscopic cholecystectomy (ERCP+EPST+CLE+LC) for acute cholecystitis in combination with choledocholithiasis from January 2016 to March 2021. Patients who underwent single-stage treatment tactics (ERCP+EPST+CLE+LC under one anesthesia) were assigned to the main group (n = 63), patients who underwent two-stage treatment tactics (ERCP+EPST+CLE+LC on the 3rd-4th day in one hospitalization) were assigned to the comparative group (n = 72). All endoscopic procedures in both groups were performed by the same endoscopist using the same technique.

Results: We compared the results of treatment of patients between the two groups. In the comparative group, cholecystectomy was performed on the 3rd-4th day after ERCP+EPST within the framework of one hospitalization. There were significant differences between the groups in the time of anesthesia, in the dynamics of a decrease in total bilirubin and blood leukocyte in the postoperative period, the frequency of postoperative complications and mean hospital stay. At the same time, no fatal cases were registered in the studied groups.

Conclusions: Single-stage surgical treatment tactics is a safe and optimal method for the treatment of acute cholecystitis combined with choledocholithiasis, characterized by a short hospital stay, a low rate of episodes of acute cholecystitis and recholedocholithiasis, which often occur with two-stage treatment tactics.

Keywords: acute cholecystitis, choledocholithiasis, endoscopic papillosphincterotomy, laparoscopic cholecystectomy.

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БІРМЕЗЕТТІ ХИРУРГИЯЛЫҚ ТАКТИКА - ЖЕДЕЛ ХОЛЕЦИСТИТТІҢ ХОЛЕДОХОЛИТИАЗБЕН ҚОСАРЛАСУЫ КЕЗІНДЕГІ ДИФФЕРЕНЦИАЛДЫ ЕМ

Түйін: Жедел холециститпен ауыратын науқастардың 8% ден 20%-да жалпы өт жолында тастар (холедохолитиаз) анықталады. Бұл патология өт қабының және жалпы өт жолдарының мәселесін бір уақытта шешуді талап етеді.

Мақсаты: Холедохолитиазбен үйлесетін жедел холецистит кезінде Бірмезгілдік (БМ) емдеу тактикасын қолданудың тиімділігін (төсек-күн, асқыну жиілігі, наркоз ұзақтығы, зертханалық деректер) негіздеу.

Зерттеу әдістері: Біз 2016 жылдың қаңтарынан 2021 жылдың наурызына дейінгі аралықта жедел холециститпен үйлесе келген холедохолитиазға байланысты эндоскопиялық ретроградтық холангиопанкреатография, эндоскопиялық папиллосфинктеротомия, холедохолитэкстракция артынан лапароскопиялық холецистэктомия (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ) өткерген 135 пациенттің медициналық тарихын ретроспективті түрде талдадық. БМ емдеу тактикасын (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ бір наркозбен) өткерген пациенттер негізгі топқа жатқызылды (n = 63), екімезгілдік (ЕМ) емдеу тактикасын (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ бір емдеуге жатқызуда 3-4 тәулікке) өткерген пациенттер салыстырмалы топқа жатқызылды (n = 72). Екі топтағы барлық эндоскопиялық процедураларды бірдей техниканы қолдана отырып, бір ғана эндоскопист жүргізді.

Нәтижелері: Біз пациенттердің емдеу нәтижелерін екі топ арасында салыстырдық. Салыстырмалы топта холецистэктомия бір ауруханаға жатқызу аясында ЭРХПГ+ЭПСТ-дан кейін 3-4-ші күні жасалды. Наркоз уақыты, жалпы билирубин, қанның лейкоциттерінің төмендеу динамикасы, операциядан кейінгі асқынулар жиілігі және пациенттің стационарда орташа күні бойынша топтар арасында операциядан кейінгі кезеңде елеулі айырмашылықтар анықталды. Бұл ретте зерттелетін топтарда өлім жағдайлары тіркелген жоқ.



Қорытынды: БМ емдеу тактикасы - бұл холедохолитиазбен біріктірілген жедел холециститті емдеудің қауіпсіз және оңтайлы әдісі болып табылады. Бұл тәсілдің ЕМ емдеу тәсілінен артықшылығы - науқастың ауруханада қысқа уақыт болуымен, жедел холецистит пен рехоледохолитиаздың төмен эпизодтарымен сипатталады. е емдеу тактикасында пайда болады.

Түйінді сөздер: жедел холецистит, холедохолитиаз, эндоскопиялық папиллосфинктеротомия, лапароскопиялық холецистэктомия.

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ОДНОМОМЕНТНАЯ ХИРУРГИЧЕСКАЯ ТАКТИКА – КАК ДИФФЕРЕНЦИРОВАННЫЙ ПОДХОД В ЛЕЧЕНИИ ОСТРОГО ХОЛЕЦИСТИТА В СОЧЕТАНИИ С ХОЛЕДОХОЛИТИАЗОМ

Резюме: Конкременты общего желчного протока (холедохолитиаз) встречаются от 8% до 20% у пациентов с острым холециститом. Данная патология требует решения проблемы со стороны желчного пузыря и общего желчного протока одновременно.

Цель: Обосновать эффективность (койко-дней, частота осложнений, продолжительность наркоза, лабораторные данные) применения одномоментной тактики (ОМ) лечения при остром холецистите сочетающиеся с холедохолитиазом.

Методы исследования: Мы ретроспективно проанализировали истории болезни 135 пациентов, перенесших эндоскопическую ретроградную холангиопанкреатографию, эндоскопическую папиллосфинктеротомию, холедохолитэкстракцию с последующей лапароскопической холецистэктомией (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ) по поводу острого холецистита в сочетании с холедохолитиазом с января 2016 по март 2021 года. Пациенты перенесшие тактику лечения (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ под одним наркозом) отнесены к основной группе (n = 63), пациенты перенесшие двухэтапную (ДЭ) тактику лечения (ЭРХПГ+ЭПСТ+ХЛЭ+ЛХЭ на 3-4-е сутки в одной госпитализации) были отнесены к сравнительной группе (n = 72). Все эндоскопические процедуры в обеих группах выполнялись одним и тем же эндоскопистом с использованием одинаковой техники.

Результаты: Мы сравнили результаты лечения пациентов между двумя группами. В сравнительной группе холецистэктомия была выполнена на 3-4-е сутки после ЭРХПГ+ЭПСТ в рамках одной госпитализации. Были выявлены существенные различия между группами по времени наркоза, в динамике снижения общего билирубина и лейкоцита крови в послеоперационном периоде, частоте послеоперационных осложнений и среднего пребывания пациента в стационаре. При этом в исследуемых группах летальных случаев не были зарегистрированы.

Выводы: ОМ тактика лечения является безопасным и оптимальным методом лечения острого холецистита сочетающиеся с холедохолитиазом, отличающиеся с коротким пребыванием пациента в стационаре, низкой показателю эпизодов острого холецистита и рехоледохолитиаза, нередко возникающих при ДЭ тактике лечения.

Ключевые слова: острый холецистит, холедохолитиаз, эндоскопическая папиллосфинктеротомия, лапароскопическая холецистэктомия.

Introduction: In recent years, the combination of acute cholecystitis and choledocholithiasis has become a more urgent and not fully solved problem in emergency biliary surgery. Stones of the common bile duct (CBD) occur from 8% to 20% cases, in patients with acute cholecystitis [1,2]. Despite the fact that the problem of acute cholecystitis in combination with choledocholithiasis is studied by many foreign researchers, there is no clear evidence regarding the safe time interval between endoscopic and laparoscopic interventions. According to Allen N. et al. (2006), if cholecystectomy is not performed after the resolution of choledocholithiasis, the frequency of further complications of gallstone disease (GD) varies from 11 to 47% [3]. With a prolonged course of intraductal biliary hypertension caused by CBD stones, the risk of developing cholangitis is extremely high. This circumstance, in turn, can lead to a rapid deterioration of the patient's condition and a lethal outcome can occur in a short time. Therefore, this pathology requires solving the problem from the side of the gallbladder and the CBD at the same time [4].

Most of the expenses among medical services fall on inpatient treatment and optimization of expenses in this direction is one of the most pressing problems. One of the effective methods of reducing costs is to reduce the length of the patient's hospital stay. Performing single-stage(SS)

treatment tactics - endoscopic retrograde cholangiopancreatography, endoscopic papillosphincterotomy, choledocholith extraction followed by laparoscopic cholecystectomy (ERCP+EPST+CLE+LC) under one anesthesia is one of the optimal methods for reducing the length of hospital stay and the frequency of reholodocholithiasis, followed by a reduction in costs for this category of patients. Several European studies have shown satisfactory results when performing ERCP+EPST+CLE+LC under one anesthesia compared to traditional two-stage(TS) treatment (ERCP+EPST+CLE+LC after 1-3 months) [5,6,7]. Considering the widespread distribution of GD and its complication of choledocholithiasis, the growth of operative interventions, as well as the widespread introduction of new technologies, the apparent relevance of further research, optimization of therapeutic operational tactics and operational tactics.

The aim of the study: Justification of effectiveness (hospital stay, frequency of complications, duration of anesthesia, laboratory data) using SS surgical treatment tactics for acute cholecystitis combined with choledocholithiasis.

Materials and methods of research. The work is based on the analysis of the results of treatment of 135 patients



with acute cholecystitis in combination with choledocholithiasis who were treated at the City Clinical Hospital No. 4 in Almaty for the period from January 2016 to March 2021. The protocol of the study was approved by the Ethical Commission of the NPJSC "KazNMU named after S.D.Asfendiyarov" (Protocol No. 13 of 25.11.2020). All patients gave informed voluntary consent to the examination and treatment in accordance with the Helsinki Declaration. The inclusion criteria were age from 16 years, bile duct stones up to 15 mm in size, acute cholecystitis (without perforation of the gallbladder), the absence of suspected or confirmed malignant neoplasms of the pancreatobiliary zone and the absence of contraindications for laparoscopic cholecystectomy, the physical status of patients according to the classification of the American Society of Anesthesiologist (ASA) I, II, III. The exclusion criteria were age up to 16 years, "large" choledochal stones (15 mm or more), late pregnancy, gallbladder cancer, contracted gallbladder, diffuse peritonitis, gallbladder perforation, ASA IV, V. Patients who failed to complete ERCP+EPST were also excluded. Each patient is consulted before surgery by a multidisciplinary team of specialists, such as an endoscopist, surgeon, anesthesiologist, therapist, cardiologist and other narrow specialists, depending on the presence of one or another concomitant disease.

All patients underwent emergency surgery. Depending on the tactics of surgical treatment, the patients were divided into 2 groups. Patients with SS treatment tactics under one anesthesia were assigned to the main group ($n=63$). These patients were simultaneously treated with ERCP+EPST+CLE+LC under one anesthesia. Patients with TS treatment tactics were assigned to the comparative group ($n=73$). In this group, there is a time interval of 48-72 hours between the endoscopic and laparoscopic stages of surgical treatment.

The study process included a comparison of laboratory parameters (the level of total bilirubin, alanine aminotransferase (ALT), aspartate aminotransferase (AST), amylase, leukocytes), duration of anesthesia, length of hospital stay, clinical treatment outcomes and complications (recholedocholithiasis).

Surgical tactics

The tactics of treatment of acute cholecystitis used by us, combined with choledocholithiasis, have been widely introduced into the surgical practice of medical institutions in most foreign countries in recent years and their results are described in detail in multiple scientific studies [8,9,10,11]. But in the Republic of Kazakhstan, the first data on the use of this tactic were mentioned in May 2020 [12], and began to be implemented in our clinic since January 2018. In the SS treatment tactics (ERCP+EPST+CLE), the first stage was used in this category of patients. In order to prevent post-cannulation pancreatitis, a nonsteroidal anti-inflammatory drug (NSAID) was given to the patients an hour before the intervention. In the operating room, after preoperative preparation under total intravenous anesthesia with artificial ventilation, the patient in the pron position under the control of an electronic optical device (Siemens Siremobil Compact L) is performed ERCP+EPST+CLE (Pentax ED-3490TK) using a Dormia basket. The duodenoscope is intubated into the descending

duodenum. Papillotome is introduced retrogradely into major duodenal papilla (MDP). After that, the catheterization of the choledochus is evaluated with the help of a conductor, after which the contrast enhancement of choledochus is performed to detect stones, then a papillotomy is conducted with the help of a papillotome, setting the middle of the cutting string at the MDP at 11-13 hours of its circumference. By pulling the handle, the cutting part approaches the front-top wall of MDP. Papillotomy is conducted by a series of short current feeds in a mixed mode of coagulation and cutting, or only cutting, gradually pulling out the papillome. Next, the Dormia basket is used for lithoextraction. After that, the bile ducts are revised with a Dormia basket or a balloon extractor. Next, a control contrast of the bile ducts is carried out, making sure that there are no stones, the contrast agent is aspirated and the bile ducts are washed with a warm saline solution. At the end of the procedure, air is aspirated from the upper gastrointestinal tract (gastrointestinal tract), then a nasogastrroduodenal probe is installed to evacuate air and to prevent iatrogenic intestinal injury. After that, to perform the second stage, the patient's position changes to his back. After processing the operating field, working trocars are installed at typical Tracing points and LC is performed. With TS treatment tactics, the technique of ERCP+EPST+LC remain identical, as with SS tactics.

Statistical processing

According to the generally accepted statistical methodology, the array of data obtained during the examination of patients was processed and calculated in a personal computer using the GraphPad Prism 8 statistical program (GraphPad Software, San Diego, California, USA) using modern methods of parametric and nonparametric statistics (Mann-Whitney). All continuous variables were presented as a mean \pm standard deviation. All categorical variables were represented as frequencies (in percentages). To check the statistical significance of the differences in the measured variables between the two groups, the Student's t-test was used. If the variation of values is high, the Mann Whitney criterion was applied for any variable. To check the statistical significance of the differences in qualitative data between the two study groups, the exact Fisher criterion was used. At the same time, the generally accepted level of significance was used in the study – $p < 0.05$.

Results. There was no statistically significant difference between demographic parameters such as the mean age and gender of patients in the two groups. 38 patients from the main group reported complaints of jaundice of the skin, and 58 patients in the comparative group presented this complaint, which shows a statistically significant difference ($p > 0.05$). The average duration of jaundice in the main group (48.6 ± 32.7 hours) was significantly longer compared to the comparison group (35.2 ± 35.4 hours). In 13 patients of the main group there were signs of cholangitis, in the comparison group cholangitis was observed in 7 patients, but this difference was not statistically significant. Acute obstructive cholecystitis was detected intraoperatively in the majority of patients in both groups. All these indicators are shown in Table 1. The average follow-up time of patients after surgery was 11.4 ± 5.1 months.

Table 1 - Main parameters of the studied groups

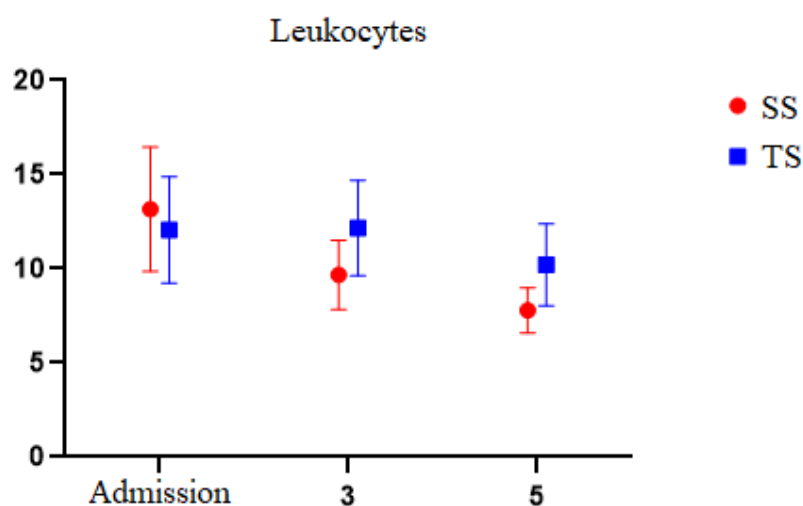
Parameters	Main group	Comparison group	p value
	(n = 63) mean (min-max)	(n = 72) mean (min-max)	
Age (years)	54.04 (23-88)	54.08 (26-84)	ns
Sex (m/w)	(19/44)	(17/55)	ns
Mechanical jaundice	38	58	p>0.05
Duration of acute cholecystitis attack	49.6±20.2	46.0±19.2	ns
Stone size in choledochus (mm)	8.1±3.2	9.2±3.6	ns
Cholangitis	13	7	ns
Duration of jaundice (h)	35.2±35.4	48.6±32.7	p>0.05
Number of stones			
Single	26	32	ns
Multiple	37	40	ns
Clinical and morphological forms of acute cholecystitis			
Acute obstructive cholecystitis	49	45	ns
Acute phlegmonous cholecystitis	16	23	ns
Acute gangrenous cholecystitis	2	0	ns

Statistically significant differences were found in several laboratory data (Table 2).

Table 2 - Laboratory data of the study groups

Parameters	Main group	Comparison group	p value
Total bilirubin before surgery	66.2±51.28	98.7±78.8	p>0.05
Total bilirubin at discharge	28.2±28.5	31.8±44.9	p>0.05
ALT before surgery	225.5±183.4	203.0±173.5	ns
ALT at discharge	85.5±57.0	87.6±91.6	ns
AsT before surgery	173.0±168.4	157.8±141.3	ns
AsT at discharge	55.4±39.4	53.2±37.0	ns
Amylase before surgery	264,4±751,3 (53.4%)	144,3±256,1 (64%)	ns
Amylase at discharge	66.6±44.3	56.9±24.9	ns
Preoperative white blood cells	13.1±3.2	12.0±2.8	ns
Leukocytes on day 3	10.8±9.0	12.1±2.5	p>0.05
Leukocytes on day 5	8.9±9.1	10.2±2.1	p>0.05

Total bilirubin at admission and at discharge showed a significant difference between the groups (Figure 1).

**Figure 1 - Dynamics of total bilirubin indicators**



Dynamics of decrease in blood leukocyte counts in the postoperative period in the main group was significantly faster than in the comparison group (**Figure 2**).

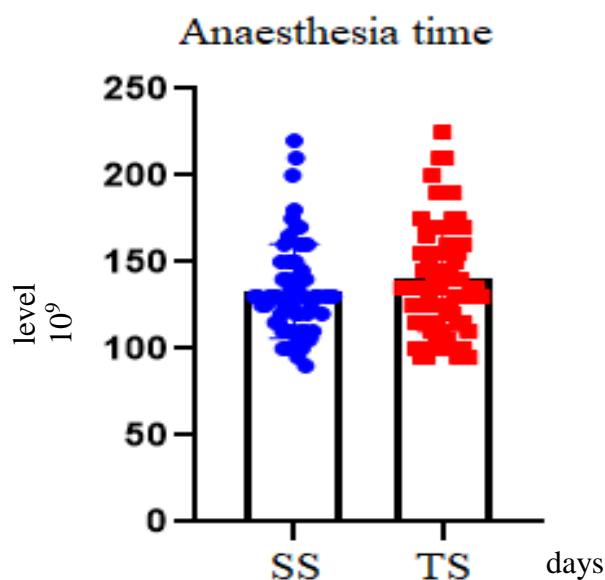


Figure 2 - Dynamics of leukocyte counts

Indicators of ALT, AsT, and amylase levels at admission and at discharge between the groups do not have a statistically significant difference. The duration of anesthesia in the main group was less (133.0 ± 27.2) than in the comparison group (145.6 ± 35.0), but there was no significant difference (**Figure 3**)

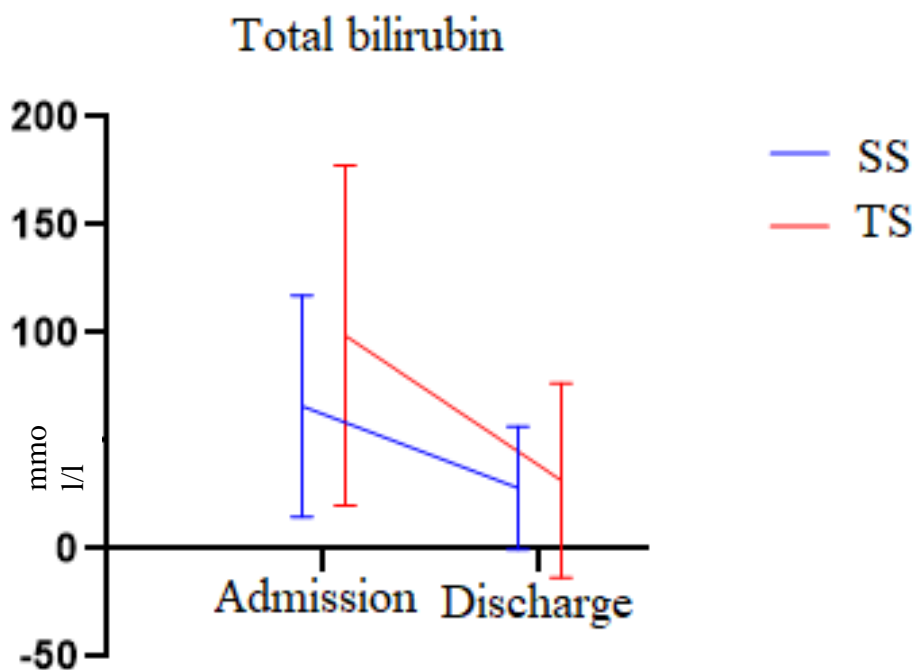


Figure 3 - Duration of anesthesia in the study groups

As the analysis of hospital stay showed, the bed-days in the main group were two times less than in the comparison group (**Figure 4**).

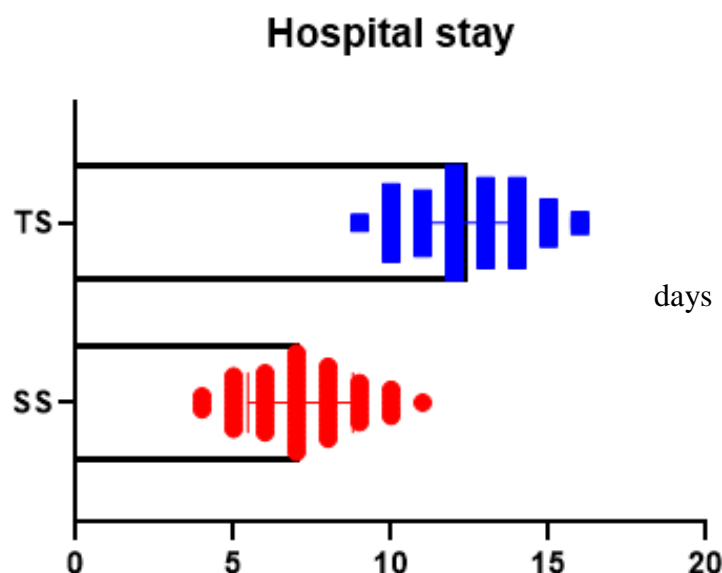


Figure 4 - Hospital stay (SS-single stage, TS-two stage)

In our practice, the success rate of cannulation and sanitation of the common bile duct was 99.8% and there were no cases of re-choledocholithiasis in the main group, since the gallbladder with stones was removed immediately after ERCP+EPST under one anesthesia, while in the comparison group, the frequency of re-choledocholithiasis was 7 cases, which showed a statistically significant difference between the two groups ($p > 0.05$). Complications after ERCP developed in 18 patients in the comparison group and in 5 patients in the main group. Acute pancreatitis developed in 3 patients in the main group and in 9 patients in the comparative group. All cases of acute pancreatitis were treated conservatively. Bleeding

in the area of MDP in 2 patients in each group. The bleeding was stopped endoscopically. These types of complications do not have a statistically significant difference between the groups.

Complications after LCE were bleeding from the stump of the cystic artery in the main group - 2 cases, in the comparison group - 3 cases. In one case, bile leakage was observed in the main group and in the comparison group - 2 cases. Bile leakage was stopped independently on the 3rd day after the operation. The above complications do not have a statistically significant difference between the groups (Table 3).

Table 3 - Distribution of complication rates between groups

Complications	Main group	Comparison group	p value
Complications of ERCP			
Recholedocholithiasis	0	7	$p < 0.0146$
Acute pancreatitis	3	9	ns
Bleeding in the area of MDP	2	2	ns
Complications of LC			
Bleeding from the stump of the cystic artery	2	3	ns
Bile discharge	1	2	ns
Bed bleeding	1	2	ns

At the same time, no deaths were registered in both study groups

Discussion. According to some authors, ERCP+EPST+CLE+LC under one anesthesia is the best solution for this category of patients, since it is possible to switch from diagnostic ERCP to therapeutic when stones are detected and eliminate the block in the choledochus with minimal aggression. [13]. Friis et al. (2007), in a recent systematic review, showed that early LC after endoscopic choledocholith extraction significantly reduces mortality, the risk of relapse of acute cholecystitis, and the length of hospital stay compared to postponed LC [14]. They concluded that patients should ideally be operated on within 24 hours of ERCP+EPST, or at least within the first few days. It should be noted that patients with acute cholecystitis were not included in this study. In our study, we used the efficiency criteria of SS tactics (laboratory data, risk of re-choledocholithiasis, length of hospital stay)

in relation to patients with acute cholecystitis in combination with choledocholithiasis. Terauchi et al. (2019) analyzed the results of treatment of 119 patients with acute cholecystitis in combination with choledocholithiasis [15]. 106 patients were treated with SS tactics, and 13 patients were treated with TS tactics. Comparison of the two groups did not reveal significant differences in the duration of surgery, the frequency of postoperative complications and hospital stay.

In turn, Rabago et al. (2006) reported a success rate of 96.6% in the ERCP+EPST+LC group and 90.2% in the LC+laparoscopic choledochal sanitation group [16]. However, LC with simultaneous laparoscopic removal of choledocholithiasis is still not widely used, since this method requires a high level of technical training of the surgeon in terms of laparoscopic skills and special video



endoscopic equipment [17]. If the health care facility does not meet the above requirements, Vecchio and MacFadyen (2002) recommend resorting to ERCP+EPST+CLE+LC under one anesthesia, which is not inferior in effectiveness to laparoscopic sanitation of the common bile duct [18]. In our study, a highly specialized experienced surgeon and endoscopist were involved. All operations were performed by the same specialists.

Optimal management of patients with acute cholecystitis in combination with choledocholithiasis largely depends on the professional level of medical staff, multidisciplinary approach (radiologist, endoscopist, surgeon, anesthesiologist) and technical equipment of the medical institution [19]. In our practice, we have not experienced any difficulties in organizing the stages of SS tactics.

In the randomized trials of Muhammedoğlu and Kale (2020), patients with acute cholecystitis in combination with choledocholithiasis were divided into 2 groups with the participation of 119 patients who were treated with SS tactics and TS tactics with delayed LC [20]. The results of the study show that SS tactics have the greatest success in treating acute cholecystitis in combination with choledocholithiasis, advantages in terms of the duration and cost of hospitalization, and a short period of anesthesia duration. The biggest advantage of SS tactics is that the procedure is performed at one stage in the same medical facility, and there is no risk of repeated episodes of acute cholecystitis and re-choledocholithiasis. Williams and Vellacot (2001) argue that the number of hospital can be significantly reduced precisely by applying ERCP+EPST+CLE+LCE under one anesthesia [21], than TS of surgical interventions. Jones et al. (2012) in their studies compared the effectiveness between SS and TS tactics based on the treatment of 20 patients [22]. As a result, there was found a statistically significant difference between the methods in terms of costs ($p=0.033$), although there were no statistically significant differences in hospital stay and complications. In our study, statistically significant differences were found in the time of anesthesia, in the dynamics of a decrease in total bilirubin and white blood cells after surgery, and in the mean hospital stay in favor of SS treatment tactics.

Enochsson et al. (2004) reported that in patients in the supine position, cannulation of the common bile duct during ERCP may be more difficult [23]. For selective choledochal cannulation Pesce et al. (2017) evaluated the effectiveness of the so-called "rendez-vous" technology, in which a conductor was inserted antegradely in the duodenum, which was removed through the mouth under the control of a duodenoscope, a papillotome was installed in the MDP, and papillosphincterotomy was performed [24]. Thanks to this technique, blind catheterization of MDP is excluded, as a result, there is a decrease in the number of complications. This technique, in turn, is a routine procedure, requires good technical equipment and high professionalism and experience. Several foreign articles reported some technical difficulties during LCE after ERCP due to duodenal and proximal jejunal pneumatosis [23]. In our practice in overestimating the ERCP procedure+EPST is performed by aspiration of air from the upper gastrointestinal tract, then a nasogastrroduodenal probe is installed to evacuate air and prevent iatrogenic damage during intestinal LC[10].

Zang et al. (2013) in their studies, evaluated the effectiveness and safety of SS tactics in 91 patients (Group A) and TS (Group B) tactics in 65 patients [25]. The mean duration of endoscopic interventions in group A was 34.9 minutes, in group B-35.3 minutes. At the same time, there

are no statistically significant differences between the groups in the success of ERCP+EPST was observed (97.8% for group A versus 98.5% for group B). The authors concluded that simultaneous resolution of cholecystocholedocholithiasis can be performed under one anesthesia and is safe for patients. In our practice, the mean duration of ERCP+EPST+CLE was 51.3 ± 23.2 minutes in group A and 51.8 ± 21.9 minutes in group B, and 73.5 ± 20.5 minutes and 80.0 ± 25.9 minutes in LC, respectively. As our observations have shown, the duration of operation largely depends on the condition of MDP, the size of the stone, and the professional level of the specialist. As larger the diameter of CBD stone, the longer the ERCP+EPST+CLE lasts. Despite different factors, no significant statistical differences in the duration of ERCP+EPST+CLE and LC were found in our work. It is impossible not to note the role of preventive maintenance of the so-called post-cannulatory pancreatitis. Incidence of acute pancreatitis after ERCP+EPST ranges from 1 to 12% and develops within 24 hours after the endoscopic procedure [26]. For preventive purposes, we perform complex conservative therapy, including drugs that inhibit pancreatic secretion, proetase inhibitors and NSAIDs. A number of foreign sources describe tactics for the prevention of acute pancreatitis, such as selective cannulation of the choledochus, stenting of the main pancreatic duct, limited administration of contrast agents and only in diluted form, followed by complete aspiration [27].

An equally important point when conducting ERCP+EPST is the patient's position on the operating table. In our practice, we use the prone position for optimal and safe cannulation of the choledochus [12]. This position facilitates selective cannulation of the choledochus, provides a convenient image of the biliary tree and prevents aspiration of gastric contents into the respiratory tract.

In most medical institutions, the management of patients with acute cholecystitis combined with choledocholithiasis is more selective, which in turn does not allow a large number of patients to conduct a comparative analysis among various methods.

In our work, there are some limitations in the form of an individual nature in relation to patients and a short follow-up period for patients after surgery. According to generally accepted standards, reliable reasoning of long-term results will take at least 5-10 years or more.

Conclusions. Both approaches to the treatment of acute cholecystitis combined with choledocholithiasis meet the requirements of minimally invasive surgery, such as reducing the injury, high therapeutic and cosmetic effect, early rehabilitation of the patient, and reducing pain. Despite the fact that each method has its own indications and contraindications, the most preferable treatment strategy for this category of patients is the one that allows you to get quite satisfactory results. Simultaneous resolution of acute cholecystitis and choledocholithiasis is accompanied by a reduction in moral and psychological trauma to the patient, material and economic costs due to the reduction of postoperative complications (re-choledocholithiasis) and hospital stay, the introduction of smaller doses of medications (one anesthesia instead of two), provides an opportunity for early rehabilitation of patients, reducing the period of disability of the population. It is necessary to further accumulate experience and improve these methods, assess the immediate and long-term results, which will allow more effective treatment of patients with acute cholecystitis in combination with



choledocholithiasis using minimally invasive and endovideosurgical methods.

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