

IMPROVEMENT OF SURGICAL TREATMENT OF PATIENTS WITH ACUTE DESTRUCTIVE CHOLECYSTITIS

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**IMPROVEMENT OF SURGICAL TREATMENT OF
PATIENTS WITH ACUTE DESTRUCTIVE
CHOLECYSTITIS**

Monography



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The monography presents data on the level of stress hormones in dynamics before, during the main surgical intervention and on the 3rd day after it, depending on the selected surgical access according to the developed program for choosing surgical tactics for the treatment of patients with acute destructive cholecystitis, taking into account individual characteristics of the body. There are also data on the use of an improved surgical instrument - a «Wound Expander» for safe cholecystectomy from a minilaparotomy access, which allows to level the risk of intraoperative bleeding and iatrogenic damage to the biliary tract and an optimized specific scale for assessing the quality of life of patients who have undergone cholecystectomy, taking into account the verification of factors affecting the course of the postoperative period and the likelihood of postcholecystectomy syndrome.

The monography is intended for surgeons, anesthesiologists, resuscitators, as well as doctors of all specialties and students of medical institutes.

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INTRODUCTION

The incidence of cholelithiasis and the number of complications associated with it are steadily increasing their share today reaches 40% among diseases of the gastrointestinal tract. On average, every fifth woman and every tenth man have concretions in the gallbladder. Cholelithiasis is diagnosed in 1 million people every year. According to various authors, the incidence of cholelithiasis in the world is about 10-12%. According to the World Health Organization, in the world, due to the increase in the incidence of cholelithiasis, there is an increase in the number of patients with destructive forms of this pathology. Despite the great success of minimally invasive surgery in the treatment of cholelithiasis, however, there is still no consensus among surgeons about the tactics of managing this category of patients, indications and contraindications to minimally invasive interventions.

A number of authors believe that a widely available cholecystectomy remains an effective method of treating acute cholecystitis. An indication for a wide laparotomy is considered to be acute destructive cholecystitis complicated by a perivesical abscess. This is due to the technical complexity of performing cholecystectomy from a minilaparotomy approach in destructive forms of acute cholecystitis complicated by dense amniotic infiltration, which often leads to the transition to a wide laparotomy with the development of associated complications in the postoperative period. It is in patients with amniotic infiltrate during minimally invasive cholecystectomy that iatrogenic damage to the extrahepatic bile ducts, hepatoduodenal ligament vessels or liver gates is

most common. At the same time, the transition to a wide laparotomy is not the optimal way to solve the problem of surgical treatment of acute cholecystitis complicated by infiltration.

Analysis of the literature data has shown that, despite numerous scientific studies, the problem of diagnosis and treatment of acute destructive calculous cholecystitis in emergency biliary surgery remains relevant. At the same time, attention is drawn to the fact that most studies are devoted to the diagnosis and treatment of acute destructive calculous cholecystitis by traditional clinical, laboratory and instrumental methods that allow us to accurately determine the severity of the pathological process and influence it, but due to their invasiveness they conceal the possibility of developing various complications (Nazirov F.G., and co-author. 2010).

The analysis of modern literature shows that there are several directions in the treatment of acute destructive calculous cholecystitis: traditional and minimally invasive surgical interventions. "However, open surgical interventions for acute cholecystitis remain the most accessible direction in common practice" (Khadjibaev A.M. and co-author. 2019).

Based on the results obtained, it was decided to reconsider the issues of training specialists, both in terms of early preoperative diagnosis of acute destructive calculous cholecystitis, and improving the technical skills of surgeons performing such operations (Prudkov M.I. 2020). At the same time, it should be noted that to date, acute destructive calculous cholecystitis has not been definitively included in the diagnostic program, the role and place of modern radiation methods (MSCT, MRI-cholangiography) has been established.

Along with this, specific indications for the use of various endobiliary interventions in the correction of the phenomena of mechanical jaundice and purulent cholangitis present in these patients have not been fully developed, the role and place in the therapeutic scheme of laparoscopic interventions have not been established. Meanwhile, at present there is an urgent need to develop a reliable laparoscopic method of treating patients with cholelithiasis complicated by acute destructive calculous cholecystitis ..." (Tamm T.I. et al. 2016) Finally, a therapeutic and diagnostic algorithm for the management of patients with acute destructive calculous cholecystitis with clear standards of action in specific clinical cases has not been developed.

The analysis of the literature shows that at the present time the therapeutic and diagnostic tactics for acute destructive calculous cholecystitis belongs to one of the urgent and still unresolved problems of modern healthcare.

In this regard, there is a need to revise the criteria for the radicality of surgical intervention in acute destructive calculous cholecystitis, depending on the informativeness of non-invasive medical imaging methods that allow at the preoperative stage to assess the features of the clinical course of the disease and identify signs of aggression of the disease, in connection with which, optimization of the diagnostic algorithm becomes especially relevant in order to choose the most radical tactics of surgical treatment in each a specific case.

CHAPTER I.

MODERN APPROACH TO SURGICAL TREATMENT OF DESTRUCTIVE FORMS OF ACUTE CHOLECYSTITIS

Frequency and prevalence of acute cholecystitis

The incidence of cholelithiasis and the number of complications associated with it are steadily increasing their share today reaches 40% among diseases of the gastrointestinal tract. On average, every fifth woman and every tenth man have concretions in the gallbladder. Cholelithiasis is diagnosed in 1 million people every year.

According to various authors, the incidence of cholelithiasis in the world is about 10-12% [1]. About 5 million people suffer from cholelithiasis in Uzbekistan. Acute calculous cholecystitis (ACC) occupies the second most frequent place in the structure of surgical pathology after acute appendicitis. In the last three decades, a steady increase in the incidence of acute cholecystitis has been observed in all age groups. People 61-70 years old are most often ill, in the general structure of morbidity they account for 32% of the total number of patients with AC, the incidence of the disease at the age of 51-60 years is 26%, at the age of 41-50 years – 14%. The incidence of AC in the age groups of 21-30 years and 31-40 years is on average from 7% to 8% [2]. At the same time, gangrenous

forms of AC are increasingly common, which are diagnosed in 2% of all cholecystectomies, mainly in elderly and senile patients in the groups of 61-70 years.

The main cause of necrobiotic processes in the gallbladder wall is an increase in intravesical pressure. High mortality in elderly and senile patients largely depends on the progressively increasing frequency of complicated forms of acute cholecystitis, in particular obturation. Destructive forms of cholecystitis in the elderly are 9 times more common than in younger age groups [44, 56, 63]. In this regard, the reduction of postoperative mortality in cholecystitis largely depends on timely diagnostic measures and their correct interpretation both at the preclinical and clinical stages, correctly selected treatment.

Modern diagnostic techniques in the treatment of acute cholecystitis

For the diagnosis of AC, a detailed study of the anamnesis data, physical examination and clinical laboratory studies is required. For patients at risk (over 60 years old) there is no single clinical or laboratory study with sufficient diagnostic accuracy to establish or exclude AC [75].

Ultrasound examination (ultrasound) of the gallbladder continues to be the "gold standard" for the diagnosis of AC. Ultrasound allows not only to objectively assess the condition of the wall of the gallbladder, but also to diagnose developing complications (pancreatitis, abscess, cholangiolithiasis, abdominal effusion, etc.). Wide availability, lack of invasiveness, lack of exposure to ionizing radiation, as well as a short study period are characteristics that make ultrasound the first choice of imaging for the diagnosis of AC [58]. The meta-analysis of Shi et al.

supports these data [71]. In addition, in the presence of postoperative scars on the anterior abdominal wall and the alleged adhesive process, ultrasound allows you to choose the point of safe insertion of the first optical trocar (the so-called ultrasound window).

In another meta-analysis conducted by Kieiwiet et al., the significance of computed tomography (CT) and magnetic resonance imaging (MRI) in addition to ultrasound in the diagnosis of AC was investigated [58].

According to it, no significant advantages of CT have been revealed, in addition, the problem lies in the ionizing radiation to which patients are exposed. As for MRI, its effectiveness is equated to ultrasound of the abdominal cavity. It is recommended to combine clinical, laboratory and visual research methods to improve the quality of the study and clarify the diagnosis, although the best combination is still unknown [55, 57]

Advantages and disadvantages of various methods of cholecystectomy

Treatment of patients with cholelithiasis is an important medical and social problem due to the ever-increasing prevalence of this disease. According to the literature, in people over 30 years of age, gallstones occur in 4-20% of the population, depending on geographical, economic and national characteristics, nutritional characteristics, and in people over 70 - already in 27-30% [20, 62, 16, 152].

Cholecystectomy has always been considered a surgical intervention requiring a highly qualified operating team capable of acting in non-standard situations caused, for example, by frequent anomalies of the extrahepatic bile ducts and blood vessels of the hepatic pedicle. The

presence of perivesical infiltrate and other purulent-inflammatory complications of acute cholecystitis significantly complicates the operation [4, 10, 13, 19, 51, 54, 82]. With traditional cholecystectomy (TCE), wide access was considered the main condition for ensuring freedom of manipulation in the subhepatic space, and intraoperative methods of examination of the bile ducts were mandatory [12, 25, 36, 37, 39, 46, 55, 66].

There are no unambiguous recommendations regarding the choice of surgical treatment methods for each individual patient, depending on his condition, the presence of concomitant pathology and the duration of the disease. The surgeon has to choose between traditional, mini-laparotomy and laparoscopic cholecystectomy, or give preference to microcholecystostomy. Each of these methods has its advantages and disadvantages.

Since the late 80s of the XX century, thanks to the development of video endoscopic techniques and the creation of special tools, rapid introduction into practice of laparoscopic cholecystectomy (LCE) began. To date, tens of thousands of LCE have been performed in the world, indications and contraindications to them have been clarified, possible complications have been studied [11, 16, 28, 31, 34, 38, 57-60, 63, 68, 72, 93, 94, 100].

The advantages and disadvantages of LCE have become obvious. Among the first can be called a small injury, the possibility of revision of almost the entire abdominal cavity (and some organs of the retroperitoneal space) and the performance of combined interventions [9, 11, 15, 22, 31, 45, 53, 57, 63, 75, 81, 90, 92].

The disadvantages of LCE are the high cost and complexity of the equipment, the inability to adequately perform the operation without special tools, the inability in some situations to perform all stages of the operation in a minimally invasive way, which requires switching to laparotomy [2, 5, 21, 27, 38, 40, 43, 69, 79, 95]. A large number of publications, scientific conferences and congresses have been devoted to these issues [29, 58, 63, 69, 70, 74].

Much less attention is paid to another minimally invasive intervention - cholecystectomy from minilaparotomy access (MLCE). However, such an operation has a number of advantages over other methods of cholecystectomy [9, 23, 48, 62, 64, 71, 74, 76, 84, 86, 88, 98]. The use of MLCE is preferable, since it not only reduces the time of inpatient treatment of patients and from an economic point of view is more profitable, but also reduces the incidence of postoperative complications and mortality [42, 147, 175, 138]. It should be noted that at the same time, the frequency of postoperative complications decreases, including due to a more rare exacerbation of concomitant diseases [138]. There is an opinion that the use of endoscopic surgical technologies is constrained by the high cost of technical support of operations and the need for specialized training of personnel [90].

In this regard, it is necessary to focus on the indications and contraindications to various minimally invasive interventions for cholelithiasis and its complications. It is believed that the indications for LCE, MLCE and TCE are basically the same [1, 11, 28, 32, 38, 57, 58].

The most fully developed general and local contraindications to LCE. These usually include the presence in patients of serious concomitant cardiovascular and respiratory diseases, portal hypertension, obesity of the

III-IV degree, late pregnancy, adhesions in the upper abdominal cavity after previously performed operations, disorders of the blood coagulation system, pronounced inflammatory perivesical infiltration, external and internal fistulas of the bile ducts, choledocholithiasis, diffuse peritonitis, purulent-inflammatory changes of the anterior abdominal wall [11, 38, 40, 58].

Not all surgeons agree with these contraindications to LCE. So, some successfully perform laparoscopic operations with extreme obesity, others - in the presence of adhesions in the abdominal cavity, internal cystic fistulas, choledocholithiasis, bile duct obstruction syndrome, local peritonitis, perivesical abscess [1, 20, 42, 50, 61]. Nevertheless, A.E. Borisov et al. [8] based on a detailed analysis, only 6 indications and 16 contraindications (6 of them absolute) to LCE were identified. In other words, according to these surgeons, there are more contraindications to performing LCE than indications.

It should be noted that difficulties during LCE for a number of surgeons, apparently, can become an insurmountable problem. Thus, S.I. Yemelyanov et al. [18] note that when performing manipulations related to the mobilization, dissection and intersection of organs and tissues, surgeons face significant difficulties when suturing or connecting them under endoscopic control. Many authors note that with laparoscopic cholecystectomy, especially for acute cholecystitis, damage to the biliary tract and bile discharge occur more often than with open cholecystectomy and amount to 0,2-0,87% [36, 172]. These difficulties are caused by the lack of direct manual contact with tissues, binocular viewing of the surgical field, loss of a sense of the true depth of the wound, limited field of view due to the relatively small diameter of the optical system and the

magnitude of the viewing angle, visual changes in the size of organs depending on the approach to them or distance from them laparoscope, limited mobility of instruments

The frequency of damage to blood vessels and the development of postoperative bleeding is observed in 0.7-1.13% of cases, which determines mortality in patients after laparoscopic cholecystectomy before 0,2% [33, 36, 142]. In addition, damage to the surrounding organs is possible. It was noted that their frequency decreases by about 2 times during the planned intervention, as well as with the growth of the surgeon's experience [36, 139].

Wound infection after laparoscopic interventions develops less frequently than after open operations - in only 0.5-5.2% of cases [36, 121].

Against the background of the imposition of pneumoperitoneum and the operation in the Fowler position, a number of nonspecific complications from the cardiovascular and respiratory systems are noted in 0.2-1.05% of patients [36, 133, 112]. It is important to note that with age, the frequency of exacerbation of chronic diseases increases, and their contribution to the formation of postoperative complications after laparoscopic cholecystectomy increases.

In recent years, a number of works have been devoted to the study of the negative effect of pneumoperitoneum on the work of the cardiovascular and respiratory systems [114, 119].

The cardiovascular system reacts to pneumoperitoneum with an increase in cardiac output, systolic and diastolic pressure and a decrease in TPVR. As mentioned above, elderly patients have multiple organ dysfunction associated with age-related changes in the body. Against the background of the imposition of pneumoperitoneum, the degree of

dysfunction increases, which leads to the development of such formidable complications as cardiac arrhythmias (sinus tachycardia, atrial extrasystole, ventricular extrasystoles and bigemina), acute myocardial infarction, pulmonary embolism [133, 119]. When studying the effect of carboxyperitoneum on ECG, significant changes in the QT interval were revealed, most pronounced among elderly patients, which is associated with an increase in partial pressure of CO₂ in the blood and the development of cardiodepression against this background. [101].

The respiratory system reacts to pneumoperitoneum by reducing the respiratory volume and functional residual capacity of the lungs due to the rise of the diaphragm dome, which leads to the development of hypercapnia, respiratory acidosis and hypoperfusion of the lungs [134]. In addition, there is a deterioration of venous outflow from the chest, an increase in intra-thoracic pressure, which can lead to the development of pulmonary restrictive syndrome. A number of authors indicate the risk of developing pneumomediastinum, orthostatic reactions [33, 56]. Excessive intra-abdominal pressure creates a risk of gastrointestinal reflux and aspiration of gastric contents.

A negative effect of intense pneumoperitoneum on liver and kidney function was noted in patients with microcirculation disorders against the background of widespread atherosclerosis [151].

Studies were conducted to study possible ways to reduce the negative effect of pneumoperitoneum: it was proposed to pump air into the abdominal cavity to no more than 12 mm Hg art., use helium for injection into the abdominal cavity and limit the tilt of the head end of the table to 10-15 °, use abdominal lifting [18, 136]. Unfortunately, the use of devices for lifting the anterior abdominal wall limits the view during the

intervention. In addition, when comparing abdominal lifting and the use of pneumoperitoneum with a pressure of no more than 7 mmHg there were no clinically significant differences [15].

Injection of inert gases does not prevent the influence of pneumoperitoneum on central hemodynamic parameters, although it does not lead to an increase in the partial pressure of CO₂ in peripheral blood [146].

An increase in the duration of the operation leads to an increase in the frequency of development of nonspecific complications due to a violation of venous return against the background of increased pressure in the abdominal cavity and the operation in the position of fowler. R.R. Gubaidullin believes that respiratory dysfunction and circulatory insufficiency initiated by pneumoperitoneum can mutually worsen and be one of the main causes of mortality in patients with intraperitoneal hypertension [23].

It has been established that increased intra-abdominal pressure can lead to an increase in intracranial pressure, especially in the presence of concomitant neurological disorders, which can cause the development of edema of brain tissue. This circumstance is especially relevant in gerontological practice [150].

With a tense pneumoperitoneum, temporary multiple organ dysfunction occurs. It would be logical to assume that the severity of this multiple organ dysfunction depends on the severity of the initial dysfunction and the duration of the pneumoperitoneum [23].

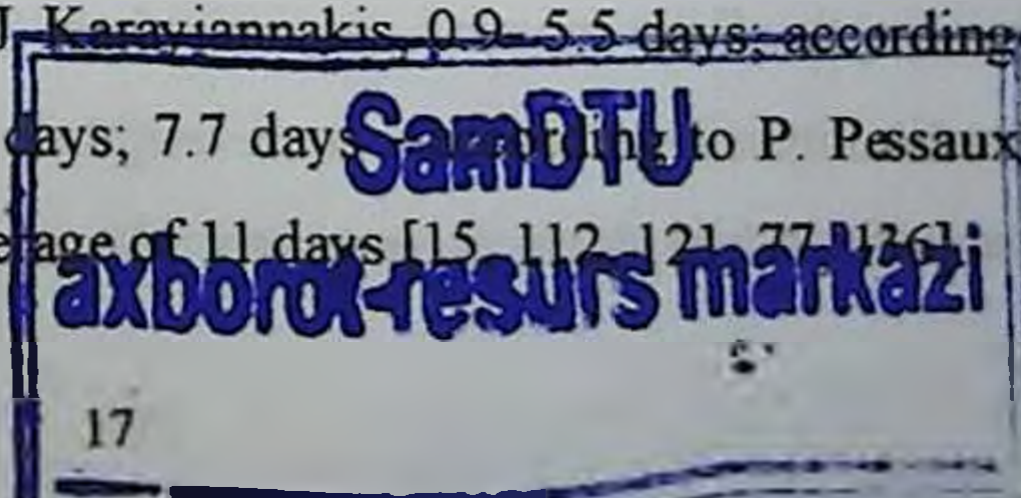
Studies have shown that combined anesthesia reduces the incidence of a number of nonspecific complications, but does not prevent their development [58].

The average duration of the operation varies significantly. This is largely determined by the individual characteristics of the patient. Thus, the presence of a history of abdominal operations statistically significantly increases the duration of the intervention; the duration from the onset of the attack and the presence of pronounced infiltrative changes also complicates cholecystectomy [121]. In addition, it is noted in the literature that in elderly patients, operations are performed longer on average (108 ± 55 minutes versus 83 ± 34 minutes in younger patients), which should be taken into account in practice to predict the average duration of interventions [76, 122].

Unfortunately, many authors do not conduct a detailed analysis of the complexity and duration of the operation depending on the age of patients, however, they indicate that the duration of the operation in elderly and senile patients is 47-133 minutes [88, 115, 132, 121, 77, 112].

The duration of postoperative treatment in a hospital during laparoscopic cholecystectomy may indicate the complexity and traumatic nature of the intervention [19].

In our country, recommendation standards have been adopted for the duration of inpatient treatment of patients [65]. In foreign clinics, a much faster transfer of the patient for further treatment on an outpatient basis is practiced. The analysis of the literature showed that the age of the patient over 70 years, as well as the experience of the operating surgeon have a direct impact on the duration of postoperative hospitalization [58, 31, 139, 77]. Thus, according to R.K. Annamaneni, the duration of hospitalization averaged 7 days; according to A.J. Karayiannakis, 0.9-5.5 days; according to R.E. Rego, an average of 3.3 days; 7.7 days according to P. Pessaux and according to A. Macri, an average of 11 days [15, 112, 121, 77, 126].



R E Rego believes that laparoscopic cholecystectomy has no advantages over the open one either in terms of the frequency of complications, or in terms of the duration of the operation and the inpatient postoperative period [102].

It should be noted that the mortality rate after laparoscopic cholecystectomy is according to various data 0- 4% [60, 36, 86, 77, 136].

So, we can conclude that, taking into account geriatric problems, as well as the features of concomitant pathology in various age categories, laparoscopic cholecystectomy cannot be unequivocally considered the "gold standard" of gallstone surgery. In this regard, it is necessary to study in more detail the possibilities of a less common minilaparotomy access for cholecystectomy, since this technique avoids the development of complications associated with the imposition of pneumoperitoneum and thus prevent decompensation of concomitant diseases.

According to A.D. Timoshin et al. [58], there are practically no general contraindications to MLCE. M.I. Prudkov et al. [44], A.M. Shulutko et al. [65] contraindications to MLCE are acute cholecystitis with a disease duration of more than 72 hours, the presence of a shrunken gallbladder, Mirizzi syndrome and pronounced scarring in the subhepatic space. The limitations for performing MLCE N. Tyagi et al. [98] include portal hypertension and the risk of bleeding due to coagulopathy.

One of the main advantages of MLCE compared to TCE, most surgeons consider a minor injury to the tissues of the anterior abdominal wall. Minidostup is most often transrectal, sometimes pararectal or median. The length of the incision can vary from 3-4 to 6-7 cm depending on the specific situation, the incision is lengthened if reconstructive surgery on extrahepatic bile ducts is necessary [28, 48, 52, 58, 59, 64, 71, 84, 86, 88,

98]. The implementation of MLCE is greatly facilitated by the use of a set of «miniasistant» tools developed by M.I. Prudkov [43]. Sometimes surgeons use instruments of their own manufacture or adapt instruments from other kits [62].

To assess the degree of surgical trauma, such parameters as the duration of intervention and anesthesia, the amount of blood loss, the need and duration of treatment of the patient in the intensive care unit, the severity of pain syndrome, the amount and duration of use of narcotic analgesics, the degree of dysfunction of vital organs and the dynamics of normalization of these indicators, the duration of hospitalization, the timing of labor and social rehabilitation are taken into account. At the same time, it is necessary to take into account the age of the patient, the severity of the disease, the presence of complications and concomitant diseases, the qualifications of the surgeon, anesthesiologist, resuscitator [28, 58, 59, 63, 64, 84].

As for the assessment of such an indicator of traumatism as the duration of the operation, then, according to E. Trondsen et al. [97], TCE took less time than minimally invasive operations. However, other surgeons [58] note significantly ($p < 0.01$) a longer duration of TCE compared with minimally invasive operations. Based on a randomized study, S. Oyogoa et al. [88] did not note significant differences in the duration of surgery and the period of hospitalization when using the laparoscopic method and minidavision.

The degree of surgical trauma should be determined not only on the basis of clinical data, but also by analyzing changes in homeostasis indicators in response to trauma [9, 58, 86]. According to G.A. Baranov and V.V. Rybachkov [6], the largest surgical wound can cause significant

metabolic shifts and endotoxemia. The authors found that after LCE, the level of average molecular weight peptides in the blood was lower by 24.3% ($p < 0.05$), acetone - by 47.5%, and methyl ethyl ketone - by 44.5% than after TCE.

The hypothalamus, the anterior pituitary gland and the adrenal glands are given the main importance in the implementation of such an organism's response to trauma. A number of structures associated with these structures (pituitary - adrenal cortex) have been identified the so-called stress hormones. A.D. Timoshin et al. [58], A.L. Shestakov et al. [[63] the levels of the main stress hormones (cortisol, prolactin, triiodothyronine, thyroxine, TCH) were studied when using LCE, MLCE and TCE. Intraoperative hormone levels in all cases exceeded their preoperative values, but there were no statistically significant differences between them in these three groups of patients. The highest levels of stress hormones (especially prolactin) were in LCE. The authors associate such fluctuations in hormone levels precisely with the adverse effect of a stressed carboxyperitoneum. P S. Vetshev et al. [9] also consider prolactin to be the most informative among all stress hormones studied.

According to these authors, in LCE, the prolactin level at the time of application of the stressed carboxyperitoneum reached the highest value and exceeded intraoperative indicators in the MLCE and TCE groups. In other words, intraoperative trauma with any methods of cholecystectomy was always observed and was expressed to approximately the same extent. At the same time, there was a significant and faster decrease in stress hormone levels in the first hours after the intervention compared with intraoperative indicators in patients who underwent LCE (2.1-5.5 times), and slower normalization of hormone levels after MLCE (1.3-1.8 times)

and TCE (1.1-1.8 times) [58, 63]. On the 2nd-3rd day, these indicators remained elevated in patients of the last two groups.

Postoperative pain syndrome is one of the main components of the concept of «surgical stress» [30, 37, 51]. Significantly less need for narcotic analgesics was noted in patients after LCE [58]. According to A.M. Shulutko et al. [64], 98.7% of patients after MLCE did not need anesthesia with narcotic analgesics, and according to S. Oyogoa et al. [88], there was no difference in the amount of analgesics necessary for postoperative anesthesia in the groups of patients who underwent LCE and MLCE.

Some authors believe that the period of postoperative hospitalization is the most reliable indicator to be guided by when determining the degree of traumatic intervention [58]. However, the duration of the postoperative stay in the hospital is greatly influenced not only by clinical data and laboratory indicators, but also by the views and traditions of a particular clinic or surgical school, some organizational (administrative) restrictions and instructions, the presence or absence of the possibility of patronage of the discharged patient at home.

A comparison of three groups of patients who underwent cholecystectomy revealed significant differences in the degree of surgical trauma with different types of access [58]. LCE was accompanied by the least trauma and was characterized by the lightest and shortest course of the postoperative period. The analysis of the results of MLCE showed an intermediate position of these interventions with respect to the criteria of traumatism - this method of cholecystectomy is significantly less traumatic than TCE, but is inferior in a number of parameters (the amount of blood loss and the duration of the operation) to laparoscopic intervention.

However, the negative effect of stressed carboxyperitoneum on the function of vital organs and body systems requires careful intraoperative monitoring and timely correction of anesthesia in LCE.

Thus, all types of access have their own indications, primarily due to the presence of restrictions for performing laparoscopic operations, more than half of which are due to pronounced inflammatory changes in the gallbladder against the background of an acute destructive process, formed perivesical infiltration, as well as the need for intervention on the bile ducts. Mini-access operations are more convenient in the treatment of patients with such complications [56, 57].

A.A. Shalimov et al. [62] believe that the use of minilaparotomic access makes it possible to expand the indications for radical surgery for cholelithiasis in patients at risk, to perform operations with a pronounced adhesive process, i.e. in conditions of contraindications to LCE.

The accumulated experience of operations from minilaparotomic access allows us to highlight a number of their advantages in comparison with TCE and LCE.

MLCE in comparison with LCE has the following advantages: 1) considerable simplicity (experience shows that a surgeon who owns TCE, quickly masters the MLCE technique); 2) the comparative cheapness of the equipment - its cost is 8-10 times less, which is important from an economic point of view; 3) the absence of a tense car-boxyperitoneum and as a consequence of intraoperative changes in respiratory and hemodynamic parameters; 4) the possibility of direct visual and palpatory control of the gallbladder, extrahepatic bile ducts, the adjacent area of the liver, the head of the pancreas, duodenum and part of the stomach; 5) the possibility of performing cholecystectomy «from the bottom» and, if

necessary, suturing the bed of the gallbladder, choledochotomy, closure of the cholecystocholedocheal or cholecystoduodenal fistula, 6) if necessary, conversion access can be quickly expanded to a typical transrectal [23, 41, 43-45, 48, 56, 71, 83, 84, 87, 99].

According to A.M. Shulutko et al. [65], based on the experience of 904 mini-access operations, 585 patients were operated on for chronic calculous cholecystitis, 319 for acute calculous cholecystitis within 72 hours of the onset of the disease. The average age of patients was 60.3 ± 4.4 years, 36.4% of them had concomitant IHD, 18.3% had postinfarction cardiosclerosis, 7.9% had complex cardiac arrhythmias, 4.1% had advanced atherosclerosis, 18.7% had hypertension, 44.2% had pneumosclerosis and pulmonary emphysema, 65.6% - obesity of II-IV degree. Four women were operated on in the II-III trimester of pregnancy, and later they had a normal delivery. The authors successfully performed combined interventions through minilaparotomy - resection of liver cysts, choledocholithotomy, formed biliodigestive anastomosis, pancreatic cystojunoanastomosis, closed intestinal fistulas and performed other operations. According to A.D. Timoshin et al. [57], in the surgeon's arsenal, in addition to laparoscopic, tools are needed to perform a mini-access, which allows in most cases to perform an operation without abandoning the principles of mini-invasiveness (i.e., if laparoscopic access fails, switch to a mini-laparotomy).

The results of mini-access operations are generally more favorable compared to traditional ones. The duration of the operation, intraoperative blood loss and the number of complications do not exceed those in TCE and are usually lower. At the same time, minilaparotomic access facilitates the immediate postoperative period, significantly reduces the length of the

patient's stay in the hospital compared to those with TCE. It is very important that the frequency of intraoperative injury of extrahepatic bile ducts in MLCE is less than in LCE, and is only 0.2-2.5%. The duration of the operation and the frequency of postoperative complications in MLCE are also less than after LCE [33, 43-45, 48, 64, 65, 71, 83, 84, 86].

The conversion of the mini-access is necessary in 1.5-12.0% of observations [44, 52, 64, 71]. The causes of access conversion are pronounced cicatricial-adhesive process in the gallbladder and hepatoduodenal ligament, empyema of the gallbladder, perivesical inflammatory infiltrate, choledocholithiasis, choledochoduodenal fistula, as well as serious intraoperative complications (bleeding from the cystic artery, extensive trauma of the extrahepatic bile ducts).

Empyema of the gallbladder, choledochodenal fistula and choledocholithiasis are not always indications for access conversion. Thus, A.A. Shalimov et al. [62] successfully performed MLCE in 167 patients with acute destructive cholecystitis, which accounted for 18.2% of the total number of operations for cholelithiasis. G.V. Duman and M.V. Ekkelman [17] successfully applied a mini-step for applying biliodigestive anastomoses in patients with mechanical jaundice. M.I. Prudkov and K.V. Titov [45] used minilaparotomic access when performing bile-removing operations in patients with cicatricial strictures of the bile ducts. AM. Shulutko et al. [65] performed 112 mini-access operations for uncorrected endoscopic choledocholithiasis, while in 45.5% of cases, choledocholitotomy with the imposition of choledochodenoanastomosis was performed.

Good results of MLCE were noted in 97.0-99.3% of cases, the frequency of complications does not exceed 2,5-12,5% [33, 44, 49, 71, 98].

The immediate and long-term results of treatment of patients who have undergone MLCE and LCE are comparable, but significantly exceed the results of TCE. Significantly faster return of patients after MLCE and LCE to habitual social and labor activity was noted [9, 33, 38, 49, 64, 65, 83].

According to S. Oyogoa et al. [88], cholecystectomy from minilaparotomy access is an alternative to LCE, especially in patients who are contraindicated for one reason or another, and in those patients for whom the cost of surgery is of great importance.

Thus, all indications for TCE, LCE and MLCE in cholelithiasis are equivalent. MLCE is a full-fledged minimally invasive and relatively inexpensive operation that allows you to perform most of the necessary manipulations on the bile ducts without such difficulties that can be observed with LCE. A sufficiently extensive experience of successful MLCE in our country allows us to conclude that this operation has significant advantages over the LCE and deserves wider introduction into clinical practice, since it can be performed in any hospital by a surgeon with experience in the.

All the qualities of MLCE allow us to recommend it as the operation of choice in the surgical treatment of complicated and uncomplicated calculous cholecystitis along with LCE. TCE is appropriate only in the most difficult situations when minimally invasive cholecystectomy is not applicable.

Conclusion of the chapter

Thus, the analysis of the literature of the issues indicates the existing objective difficulties in the surgical treatment of AC, especially destructive forms. The technical ability and desire to effectively help the patient are limited by the fact that today indications and contraindications to urgent minimally invasive radical operations are insufficiently specifically and reasonably formulated, which are preferable due to low traumatism. With age, polymorbidity increases in patients, limiting active surgical actions.

Despite all the successes and achievements in the treatment of acute calculous cholecystitis, the question of choosing a variant of cholecystectomy for destructive forms of the disease remains open. All this was the reason for this study.

CHAPTER II.

CLINICAL CHARACTERISTICS OF MATERIALS AND RESEARCH METHODS USED

General characteristics of the clinical material

The work is based on the evaluation of the results of surgical treatment of patients with acute destructive cholecystitis treated in surgical departments 1-clinic of the Samarkand State Medical Institute (clinical base of the Departments of Surgical Diseases No. 1 and General Surgery of the Samarkand State Medical Institute) for the period from 2017 to 2021. Depending on the treatment tactics, patients are divided into two groups. The main group consisted of 119 patients who were on inpatient treatment from 2019 to 2021. The comparison group consisted of 82 patients who were on inpatient treatment from 2017 to 2018.

The study included all operated patients admitted to the hospital with clinical symptoms of acute destructive cholecystitis.

We excluded patients with the phenomena of mechanical jaundice or cholangitis from our study, since these complications are accompanied by a higher level of mortality and complications and may distort the data of our study.

The study included 201 patients, including 44 men and 157 women aged 17 to 87 years. The distribution of patients into groups and their comparative characteristics by gender and age are shown in Table 2.1.

Table 2.1

**Distribution of patients with acute destructive cholecystitis
by gender and age**

Patients	Studied groups	
	Main group (n=119)	Comparison group (n=82)
Men	16 (13,43%)	22 (26,8%)
Women	103 (86,6%)	60 (73,2%)
Average age, years	57,7±13,9 (from 17 to 85 years old)	59,6±14,2 (from 23 to 87 years old)

As can be seen from the table, the groups of patients were comparable by sex and age ($p < 0.05$).

The structure of morphological forms of acute cholecystitis in patients of the studied groups is shown in Figure 2.1.

The morphological form of acute destructive cholecystitis was identical in both studied groups.

When assessing the level of leukocytes in the general blood test, as an indicator of the intensity of inflammatory changes in the gallbladder wall, the following data were obtained, reflected in Table 2.2.

As follows from the table, there were no significant differences in the level of leukocytosis among the patients of the compared groups.

Among the patients of all groups, the duration of the attack before the operation was estimated, as shown in Table 2.3. As can be seen from the table, the duration of the attack in the studied patients varied widely and did not differ between the groups ($p < 0,05$).

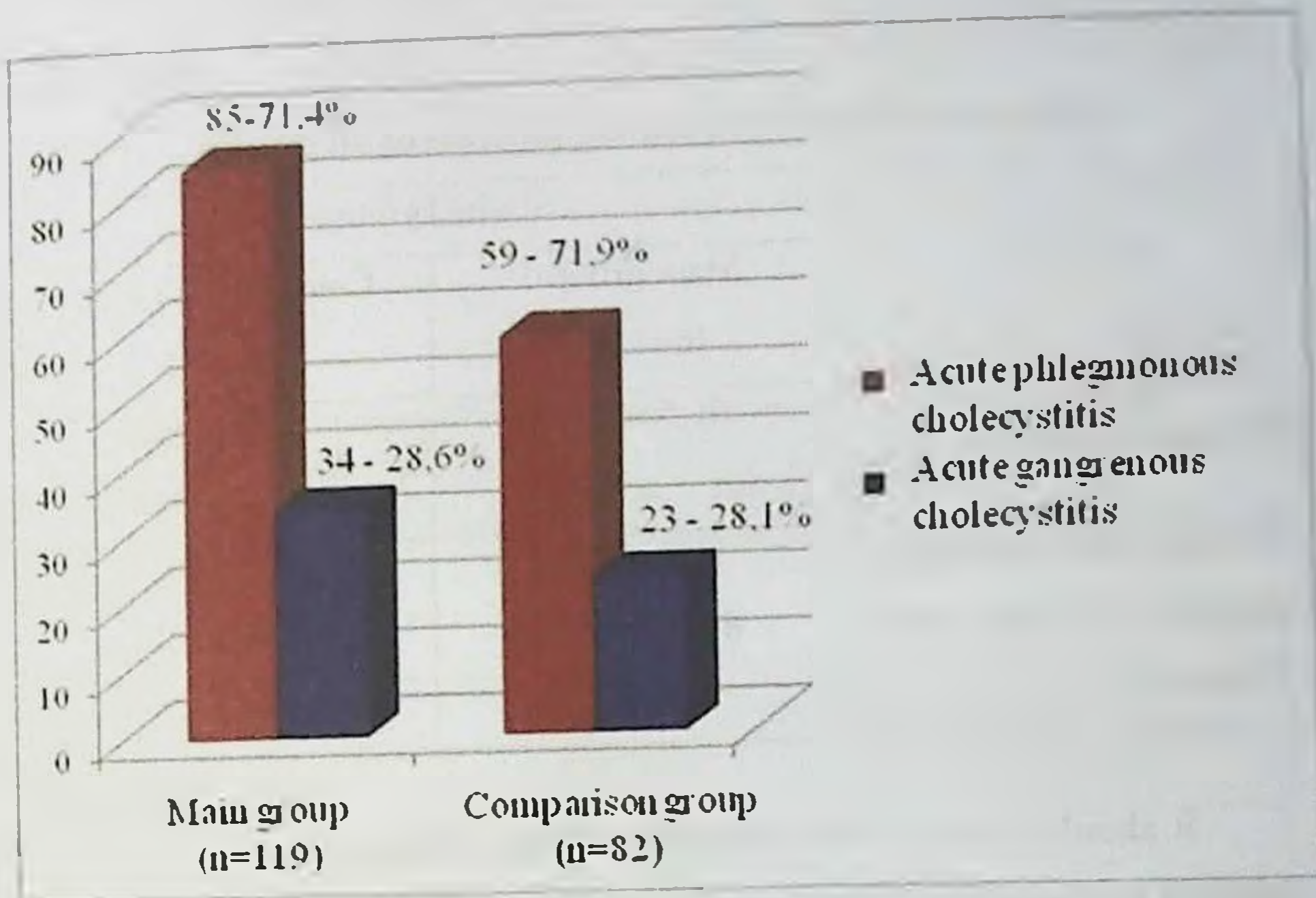


Figure. 2.1. Morphological forms of acute destructive cholecystitis in the study groups

Table 2.2

The level of blood leukocytes in patients of the compared groups

	Studied groups	
	Main group (n=119)	Comparison group (n=82)
Number of leukocytes, $\times 10^9/l$	$13,7 \pm 2,3$	$14,5 \pm 2,8$

Table 2.3.

Duration of the attack among patients of all groups

Patients	Studied groups	
	Main group (n=119)	Comparison group (n=82)
Duration, hours	61,5±62,9 (от 3 до 360)	76,3±74,8 (от 6 до 336)
Patients with an attack duration of more than 72 hours	84 (70,6%)	57 (67,8%)

It should also be noted that the number of patients with an attack duration of more than 72 hours in the main group was higher (11.8%) than in the comparison group (8.5%). Comparing these data with the results presented in Figure 2.1, it can be concluded that there is no direct dependence of the degree of destructive changes in the gallbladder wall on the duration of the attack.

We also took into account the frequency of perivesical complications (infiltrates, abscesses, local peritonitis), the data we obtained are presented in Table 2.4.

Judging by the data obtained, when diagnosing perivesical abscess or local peritonitis, mini-access cholecystectomy was performed more often in the main group of patients, and in the comparison group with these complications, conventional cholecystectomy was performed more often (the differences were significant compared with the comparison group, at $p < 0.05$).

It should be noted that in some patients a combination of local peritonitis with perivesical abscess or infiltration.

The structure of concomitant diseases in patients of all groups is presented in Table 2.5.

Table 2.4

Types and number of complicated forms of acute cholecystitis

Duration of the attack	Studied groups	
	Main group (n=119)	Comparison group (n=82)
Perivesical infiltrate	27 (22,7%)*	21 (25,6%)
Perivesical abscess	8 (6,7%)	7 (8,5%)
Local peritonitis	3 (2,5%)	4 (4,9%)

*Note: * – at $p < 0.05$*

The table shows that hypertension of 2-3 degrees, ischemic heart disease, and obesity of 2-3 degrees were most common in patients of both groups (the differences were significant in comparison with the comparison group, at $p < 0.05$). More than a third of patients have 2 or more concomitant diseases. The number of patients without concomitant diseases ranged from 19.3 to 20.7%.

According to the general status, severity of concomitant diseases, as well as the risk of surgery and anesthesia, patients were distributed according to a scale proposed by the American Association of Anesthesiologists (American Society of Anesthesiologists – ASA).

This scale is based on the presence and severity of severe concomitant systemic diseases in patients and implies the allocation of the following 5 classes.

Table 2.5

The frequency of concomitant diseases in the study groups

Concomitant pathology	Studied groups			
	Main group (n=119)		Comparison group (n=82)	
	abs.	%	abs.	%
COPD	5	4,2	1	1,2
IHD	15	12,6	11	13,4
HD 2-3 grade	20	16,8	16	19,5
Diabetes mellitus	8	6,7	5	6,1
Adhesive disease of the abdominal cavity	6	5,0	4	4,9
Obesity of 2-3 grade	8	6,7	6	7,3
Pregnancy 2-3 trimester	1	0,8	-	-
Chronic Gastritis	12	10,0	14	17,1
Chronic Pancreatitis	8	6,7	5	6,1
Peptic ulcer and duodenal	3	2,5	1	1,2
Chronic Pyelonephritis	4	3,4	5	6,1
Iron deficiency anemia	1	0,8	2	2,4
2 or more concomitant diseases	33	27,7	24	29,3
Without concomitant diseases	23	19,3	17	20,7

- Class I - patients without systemic diseases;
- class II - patients with a compensated systemic disease that does not significantly restrict physical and social activity;
- class III - patients with a systemic disease that restricts physical and/or social activity, but can be compensated as a result of treatment;

- Class IV - patients with decompensated disease requiring constant medication;

- Class V - patients who may die within 24 hours, regardless of whether or not medical care will be provided to them.

There were no patients at risk of class V anesthesia in the study groups. In our study, the risk class of ASA anesthesia in patients of all groups varied from I to IV, but there were no significant differences in this indicator in patients of different groups (Fig. 2.2).

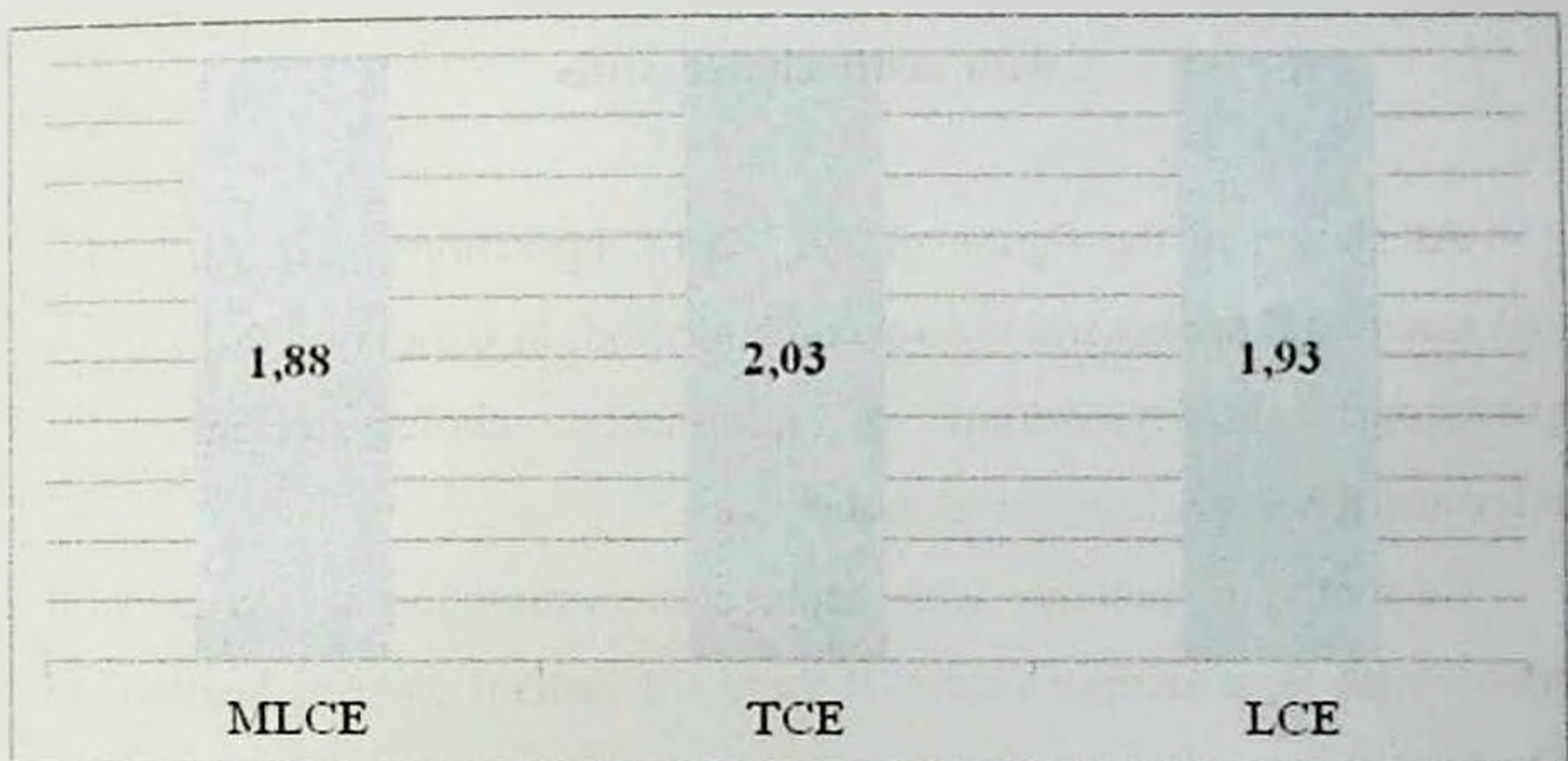


Fig. 2.2. Average ASA rate

It should also be noted that during the study period, laparoscopic access was introduced in the hospital and began to be used significantly more often, including in the treatment of acute cholecystitis. The frequency of cholecystectomies, depending on access during the study period, is shown in Figure 2.3.

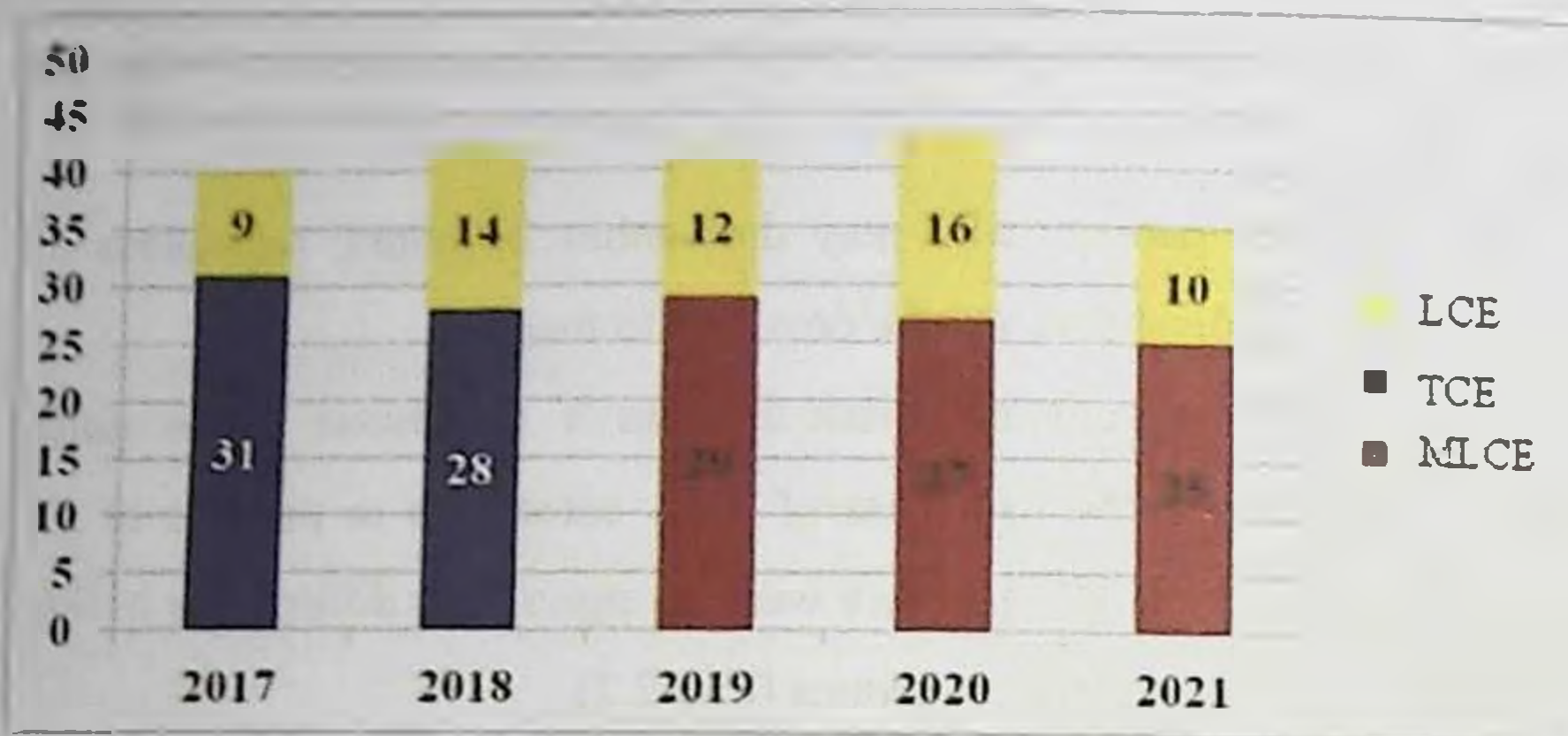


Fig. 2.3. Frequency of cholecystectomies by type of access in patients with acute cholecystitis

As shown in the figure, in 2017-2018, operations were performed from traditional access and laparoscopic method. In the period 2019-2021, laparoscopic cholecystectomy or mini-access cholecystectomy was performed for acute destructive cholecystitis.

Currently, in patients with acute cholecystitis, we try to perform surgery with laparoscopic access. If there are general contraindications to pneumoperitoneum or indications for access conversion appear, we use a mini-laparotomy access. Traditional open interventions are used when it is impossible to use minimally invasive approaches or with symptoms of widespread peritonitis.

Thus, a comparative analysis of the studied groups showed that the patients in both groups were comparable in gender, age and duration of the attack before surgery. Patients with perivesical infiltrate and concomitant pathology contraindications to pneumoperitoneum were more often subjected to cholecystectomy from a minilaparotomy access. According to the frequency and types of concomitant diseases, patients of the main

group are leading, although a comparative assessment of the risk of anesthesia (according to the ASA scale) did not reveal significant differences among patients of both groups. Based on the above, we can talk about the comparability of the compared groups of patients.

Characteristics of the research methods used

Instrumental preoperative examination was standard and included, in addition to general (general clinical blood and urine tests, biochemical blood analysis, ECG, chest X-ray, etc.), ultrasound examination of the abdominal cavity and pelvis, as well as endoscopic assessment of the upper gastrointestinal tract.

Preoperative examination of the patient is a very important moment in small-access surgery, and especially in minilaparotomy, since intraoperative manual examination of organs outside the operation area is impossible.

The diagnostic methods used were aimed at identifying, differential and topical characteristics of destructive changes in the gallbladder and bile ducts. All patients underwent a comprehensive examination, which included, along with an assessment of the clinical course of the disease and generally accepted laboratory and instrumental examination methods (general blood, urine, biochemical blood analysis, endoscopic examination of the stomach and duodenum). Various special research methods were used. Non-invasive: ultrasound, computed tomography (CT), magnetic resonance imaging (MRI). Invasive: ICH, ERCPG, videolaparoscopy and relaparoscopy.

Intraoperative cholangiography of ICH

Intraoperative cholangiography is considered absolutely indicated in anatomically difficult situations. Intraoperative cholangiography was performed either through the cystic duct, or a contrast triobmast was injected punctually, urographin 76% - 20.0.

Conversion should also be considered as a measure of diagnosis and prevention of damage to the EHBD. The basic principles in making a conversion decision include two cases: prudence and necessity. The prudent transition is associated with the discovery of more complex anatomical and topographic relationships than expected before surgery (pronounced inflammatory changes near the neck of the gallbladder, difficulties in differentiating extrahepatic bile ducts). The transition, due to necessity, is carried out in the event of complications, sudden bleeding that cannot be safely stopped with LCE or bile discharge when its source is not determined. According to our observations, out of 11 patients with damage to the IVS, 9 and 2 patients after LCE and MLCE, respectively, underwent conversion. With laparotomy, it is necessary to accurately determine and trace the CBD and the hepatic duct, and perform ICH.

Taking into account the variety of clinical manifestations of inflammatory diseases of the biliary tract and their frequent combination with other diseases, the severity of which was taken into account when choosing surgical access (cardiovascular and pulmonary diseases, etc.), the clinic used the entire arsenal of diagnostic and laboratory research methods to identify both major and concomitant diseases. Ultrasound scanning, which was performed in all operated patients, was leading in the diagnosis of the nature of pathological changes in the biliary tract.

Ultrasound examination (ultrasound). Ultrasound examination was carried out using the devices «Aloka SSD-630», «Aloka-500» and «Toshiba SAL- 38 AS» (manufactured in Japan). The method of ultrasound diagnostics is based on the difference in the absorption and reflection of ultrasonic waves by various tissues and structures of the body. Pulsed radiation and reception of reflected ultrasonic waves is carried out by a special converter (sensor). The higher the frequency of the echo signal, the lower the depth of its penetration. The technical features of the devices used made it possible to scan any kind of sensors located on the front control panel.

Sensors were used in the work: linear scanning with a frequency of 3.5 and 5 Mhz; convex sector scanning with a frequency of 3.5 Mhz; duplex convexing – 3.5 Mhz and a scanning angle of 60° with a phased array of 128 channels, which provided high spatial resolution and high-quality image with color mapping of flows through the vessel under study in real time at minimal ultrasonic flow. There was also a special linear scan biopsy sensor with an acoustic signal frequency of 3.5 Mhz.

The reflected echo signal, after transformation into electrical pulses, amplification and computer processing, was received on the monitor screen in the form of a planar image with various shades of gray. The brightness of each individual point was directly proportional to the intensity of the reflected signal: the higher it is, the greater the brightness. There was no image behind the formations that completely reflected ultrasound (calcifications). A similar phenomenon is called "acoustic shadow". On the contrary, for the liquid formations through which the waves passed, practically without weakening (for example, a cyst, a gallbladder), an echo signal amplification was determined in comparison with the surrounding

tissues of the echo signal and caused the effect of compensatory ("back") amplification. The large memory capacity of the converter (512x512 bits) made it possible to obtain an image with 64 gray gradations. On the monitor screen, it was possible to enlarge the image and simultaneously receive two different images without the slightest loss of information.

Any image processing was possible both in real time and with a fixed image. The measuring program made it possible to independently determine four parameters: linear distance, perimeter, plane and volume, and to read the effectiveness of these measurements simultaneously. For anatomical binding of the image, markers of the sensor location were provided. The device can operate in A, B, and M modes separately, as well as in their combinations by screen area.

In recent years, the Dopplerography method has been greatly developed, which provides valuable additional information about the state of the liver and the pathological focus in it. The Doppler effect underlying this method is that the frequency of ultrasonic signals when they are reflected from moving objects changes proportionally to the speed of movement of the object being lotted along the axis of signal propagation. When moving towards the sensor, the frequency of the reflected signal increases, when reflected from a receding object, it decreases (in the device, blood flow is encoded in red, outflow is blue). The Doppler frequency during graphical recording is fixed in the form of an analog curve. The higher the flow rate, the further from the zero line the peak of the Doppler signal is located and the higher the offset frequency. There is an alphanumeric keyboard for entering information (26 characters) and any test on the screen area.

If, as a rule, no special preparation of the patient was required for liver imaging, then for ultrasound diagnostics of the state of the bile ducts, it was preferable to conduct the study on an empty stomach after 8-10 hours of fasting, and with severe flatulence, 2-3-day preparation of the patient was required, including a slagless diet and intake of adsorbing drugs.

Intrahepatic bile ducts are normally not visible and are determined only with biliary hypertension in the form of tubular structures located exactly under the branches of the portal vein – a symptom of «double-barreled» or «parallel fingers».

The common bile duct is visualized in almost 100% of studies. Its detection is possible after identification in the area of the liver gate of the portal vein, above which it is located. Normally, in patients who have not undergone surgery on the biliary tract, its diameter does not exceed 0.6 cm. Its various changes – an increase in diameter, the presence of concretion shadows in its lumen were the basis for performing additional research methods (ERCPG in 6 patients – 5.2%).

The gallbladder on longitudinal scanning is visible as an echonegative formation located in the projection of segment IV on the visceral surface of the liver, rounded, pear-shaped or cylindrical, with a thin wall (normally its thickness does not exceed 0.3 cm). When evaluating ultrasound data, attention was paid to: the number and size of concretions, their mobility and localization, thickening of the gallbladder wall, the possibility of visualizing the neck of the latter, the presence of paravesical effusion.

According to ultrasound data, a reliable sign of technically complex cholecystectomy is:

- lack of free lumen of the gallbladder;
- thickened gallbladder wall and lack of visualization of the gallbladder neck;
- large fixed stones in the neck of the gallbladder (Fig. 2.4);
- paravesical fluid accumulations (Fig. 2.5);
- scleroatrophic gallbladder;
- expansion of the common bile duct;
- the presence of concretions in the common bile duct.



Fig. 2.4. Echographic picture of acute obturation calculous cholecystitis

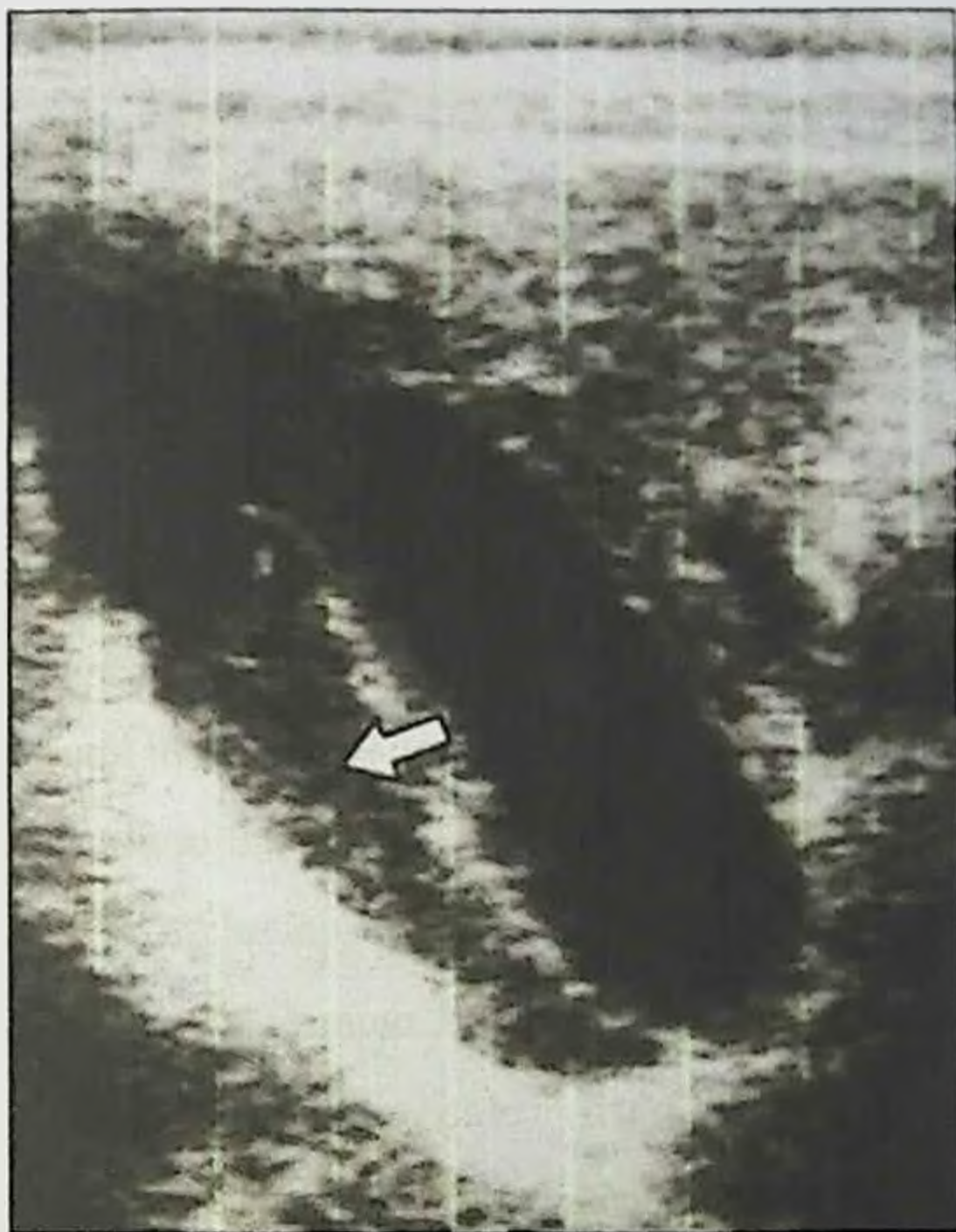


Figure 2.5. Echographic picture of acute destructive stone-free cholecystitis with complication of perivesical abscess

These prognostic data indicate the feasibility of performing a minilaparotomy.

The above ultrasound data on the condition of the gallbladder and hepaticocholedocha made it possible to determine not only indications for cholecystectomy, but also for ERCPG, that is, the possibility of using a two-stage tactic. The first stage is ERCPG, when pathological changes in hepaticocholedoch are detected, their simultaneous correction is carried out (endoscopic papillotomy, extraction of concretions, and others).

Thus, patients with benign lesions of the bile ducts remain a diagnostic complex category of patients, which is associated with both a

long history and complicated course of the disease, polymorphism of the clinical picture of the latter, the presence of scar-inflammatory changes in the hepatopancreatoduodenal zone in previously operated patients. Verification of all changes in the bile ducts should be carried out using a comprehensive instrumental examination of patients before and during surgery.

The data obtained during the study were subjected to statistical processing on a Pentium-IV personal computer using the Microsoft Office Excel-2016 software package, including the use of built-in statistical processing functions. The methods of variational parametric and nonparametric statistics were used with the calculation of the arithmetic mean of the studied indicator (M), the mean square deviation (σ), the standard error of the mean (m), relative values (frequency, %) The statistical significance of the measurements obtained when comparing the average values was determined by the Student's criterion (t) with the calculation of the probability of error (P) when checking the normality of the distribution (by the criterion of kurtosis). The level of confidence $P < 0.05$ was taken as statistically significant changes.

CHAPTER III.

COMPARATIVE ASSESSMENT OF THE LEVEL OF STRESS HORMONES DURING CHOLECYSTECTOMY FROM VARIOUS SURGICAL APPROACHES

Studied hormonal stress indicators in patients with acute destructive cholecystitis

For a comparative assessment of the traumaticity of various approaches during cholecystectomy (laparoscopic, minilaparotomy, laparotomy), we studied the state of stress hormones. When studying the hormonal response to stress, as a rule, the adrenocorticotrophic hormone is studied, which does not fully reflect the entire spectrum of the neurohumoral response, and therefore the study of various components of the neurohumoral response to stress (prolactin, cortisol, thyroid hormones) can more objectively show how the so-called minimally invasive interventions are in fact low-traumatic.

Surgical trauma – «stress» according to Selye (1935), is the sum of all non-specific phenomena that occur in the body under the action of various emergency stimuli-stressogens that trigger a systemic endocrine metabolic response aimed at restoring disturbed homeostasis.

At the same time, it is noted that the urgent adaptation of the body to the effects of any stressful factors, including surgical intervention, is carried out by many hypothalamic-pituitary hormones and various endogenous biologically active substances, such as catecholamines, cyclic

nucleotides and others that have a direct or indirect effect on vascular tone, myocardial contractility, tissue metabolism.

The main role in compensatory and adaptive reactions of the body is played by the hypothalamic-adrenal system, while the tropic hormones of the anterior pituitary gland stimulate the secretion of hormones of the adrenal cortex and other interested structures (thyroid and parathyroid glands and others).

In connection with the above, we set out to determine the quantitative nature of the functional activity of some endocrine regulation systems of the body as indicators of the degree of operational and postoperative stress in patients with various surgical approaches during operations on the biliary tract.

To obtain objective data, we examined 57 patients with ADCC, in whom, for various reasons, three variants of cholecystectomies were performed (Table 3.1) – laparoscopic, from minilaparotomy and laparotomy approaches.

The studied groups were identical ($p < 0.05$) in a number of parameters (by age, duration of the main lesion and frequency of concomitant diseases), which allowed us to obtain reliable information about the studied stress hormones, taking into account the compared groups of patients.

Due to the significant spread of literature data on the norm indicators of the studied hormones and the inability to apply them to each specific observation, we found it possible to abandon this parameter, and compared the results with the initial data.

Table 3.1.

Characteristics of patients in whom hormonal stress indicators were studied

Compared indicators	Group of operated patients:		
	LCE	MLCE	OCE
Number of observations	20	20	17
Average age (years)	59,6±5,5	66,9±3,3	62,5±7,5
Weight kg, (M±m)	68,8±3,47	75,6±3,11	71,5±3,12
Average duration of the disease (years)	7,2±2,2	5,1±1,4	5,2±2,3
Average duration of the operation (min)	56,3±7,1	55±4,5	66,8±8,2

Table 3.2

Stepwise hemodynamic parameters during surgery (M±m) on the biliary tract from various surgical approaches

Indicators of units of measurement:	Type of CE:	Research stage		
		Result:	During cholecystectomy:	After the end of the ALV
Blood pressure systole., mmHg:	1	115,5±3,43	108,0±3,23	117,8±4,15
	2	121,1±3,33	110,9±2,37	113,8±2,17
	3	117,9±3,73	107,3±2,43	111,3±3,21
Blood pressure dias., mmHg:	1	68,2±2,8	65,4±1,48	70,0±2,47
	2	73,9±2,93	66,7±2,01	69,1±1,98
	3	72,1±2,93	64,7±2,37	67,3±2,54
Average blood pressure, mmHg:	1	84,7±2,77	78,2±1,95	85,5±3,01
	2	89,1±2,88	81,5±2,09	83,1±1,79
	3	87,3±3,02	78,3±2,29	81,5±9,38
Heart rate, stroke/min:	1	75,7±3,67	72,9±1,87	77,2±1,39
	2	80,7±2,25	74,1±1,69	76,0±1,7
	3	76,3±2,59	72,4±2,13	74,1±2,53

Note: 1 – LCE; 2 – MLCE; 3 – OCE.

Control over the adequacy of anesthesia was carried out according to generally accepted criteria: indicators of hemodynamics and gas exchange, acid-base state of capillary blood, hemoglobin and hematocrit levels, ECG.

When analyzing the results, a greater degree of comparability of hemodynamic parameters of all three groups under study should be noted (Table 3.2). The stepwise hemodynamic profile was similar, which proved the adequacy of the anesthesia, as evidenced by the parameters of the acid-base state and blood gases at all stages of the study.

An objective confirmation of the adequacy of the anesthesia technique with ketamine is the stability of maintaining the level of one of the main stress hormones in the blood plasma – cortisol at all traumatic stages of the operation. The constancy of the concentration of thyroid-stimulating and thyroid hormones in the blood, which are involved in the regulation of metabolic processes in stressful conditions, also indicates the adequacy of anesthesia. Maintaining the functional activity of the pituitary-thyroid gland system within normal physiological values is of undoubted clinical importance for surgical patients in the light of available data on the relationship of these hormones and the traumatic nature of the operation.

However, there is no information in the literature on the assessment of the stress factor by studying the hormonal parameters noted above at various surgical approaches for operations on the biliary tract and during certain stages of surgical intervention.

According to our data, these studies are necessary for the correct interpretation of the advantages and disadvantages of various surgical approaches, the choice of which should maximize the safety of the intra- and postoperative period, especially in patients with various concomitant cardiovascular and other diseases.

To solve the questions raised, we have studied step by step the change in the indicators of «stress» hormones in patients operated from various surgical approaches at various stages of treatment:

- 1) Initial condition (3 days before surgery);
- 2) During the main stage of the operation;
- 3) In the immediate postoperative period (2-3 days after surgery).

The state of stress hormones during operations with acute destructive cholecystitis from different approaches

Considering that the stress hormones studied by us have a different mechanism of influence on homeostasis during surgery, even with adequate anesthesia, we considered it necessary to analyze the results of the study separately for each studied hormone at different stages of treatment from the three surgical approaches mentioned above.

When evaluating the results of our studies on changes in the level of "stress" hormones, all intra- and postoperative indicators were compared with the initial data, and not with the norm, the parameters of which fluctuate within large limits. Therefore, for greater objectivity in assessing the severity of surgical stress, we compared not absolute averages, but their variability in percentages during and after surgery compared to the initial data.

When choosing the hormones under study, we proceeded from the fact that one of the most important organizers of the adaptation syndrome during surgical stress is the hypothalamic-pituitary-adrenal system, which provides a rapid and adequate increase in the secretion of glucocorticoids

under any traumatic effects on the body, this is preceded by increased secretion of hypothalamus and ACTH by the pituitary gland. Based on the above, in order to assess changes in the neuroendocrine response to cholecystectomy from different surgical approaches, we studied changes in a number of so-called «stress» hormones before, during and on the third day after surgery (Fig. 3.1-3.4).

1. Prolactin, which is one of the hormones that respond most significantly to surgical stress, was studied in 57 patients. We found that before the operation, the average prolactin values ranged from 215.2 ± 21.6 to 283.0 ± 113 Mmu/ml, which was within the average norms.

The conducted studies have shown that during the gallbladder extraction operation, the variability of the average amount of prolactin showed that when the gallbladder was isolated, it was 1.5 times higher with laparoscopic technique (+832.2%) than with cholecystectomy from minilaparotomy (+315%) and laparotomy (+623.1%) approaches (Fig. 3.1).

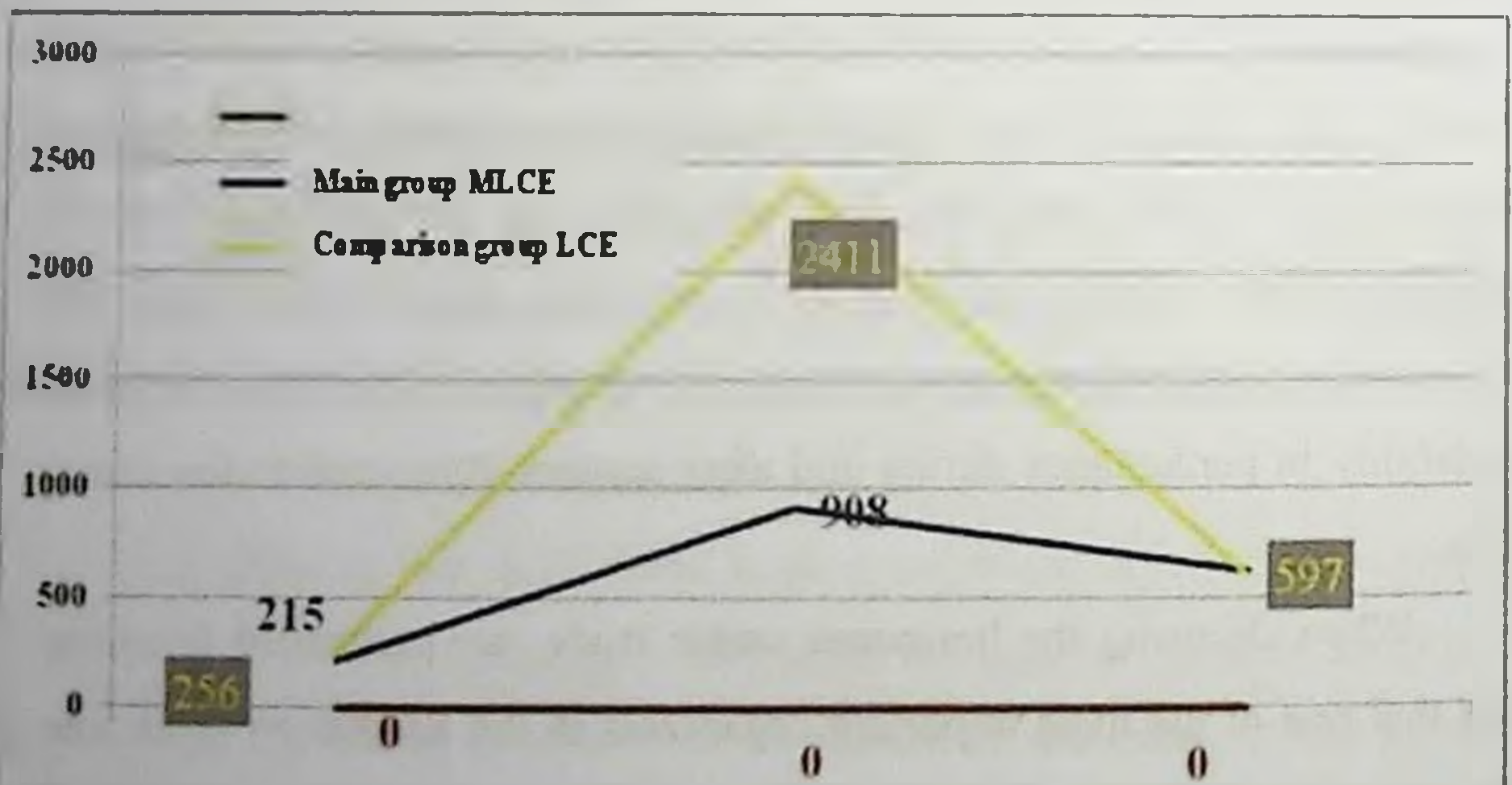


Figure 3.1. Prolactin level at all stages of the study

On the 3rd day after surgery, it was noted that the tendency to normalize prolactin was most noticeable after laparoscopic cholecystectomy – the deviation from the initial data was +123%, while with the laparotomy technique it was less pronounced (+286%).

Consequently, according to our data, a significant increase in prolactin occurred in LCE compared with operations from laparotomic and minilaparotomic approaches. According to the variability of prolactin levels during surgery and on the 3rd day after it, surgical interventions from the mini-laparotomic access occupy an intermediate value between laparoscopic and laparotomic operations.

1. Cortisol – in the patients examined by us, its initial level ranged from 252.1 ± 42.6 to 342.1 ± 48.2 nmol/l, which was within normal parameters. The maximum increase in cortisol levels was observed at the stage of gallbladder removal by laparotomy (+106.5%) than with other methods, laparoscopic (+56.1%) and minilaparotomy cholecystectomy (+19.6%). On the 3rd day after surgery, the most pronounced trends towards normalization of cortisol levels were noted in patients after laparoscopic and minilaparotomy cholecystectomies, in which the variability of the average amount of hormones compared to the baseline was +4.5% and 37.6%, respectively, and with laparotomy +59.2% (Fig. 3.2).

2. Thyroid hormones (T4, TSH) – functionally related to the pituitary gland and changing during various surgical interventions. During the operation, the T4 level in different variants of cholecystectomy was lower than baseline. Postoperative changes in T4 with laparoscopic and minilaparotomic techniques corresponded to intraoperative ones, and only

with laparotomic cholecystectomy a significant increase in hormone content (12.9%) was revealed (Fig. 3.3).

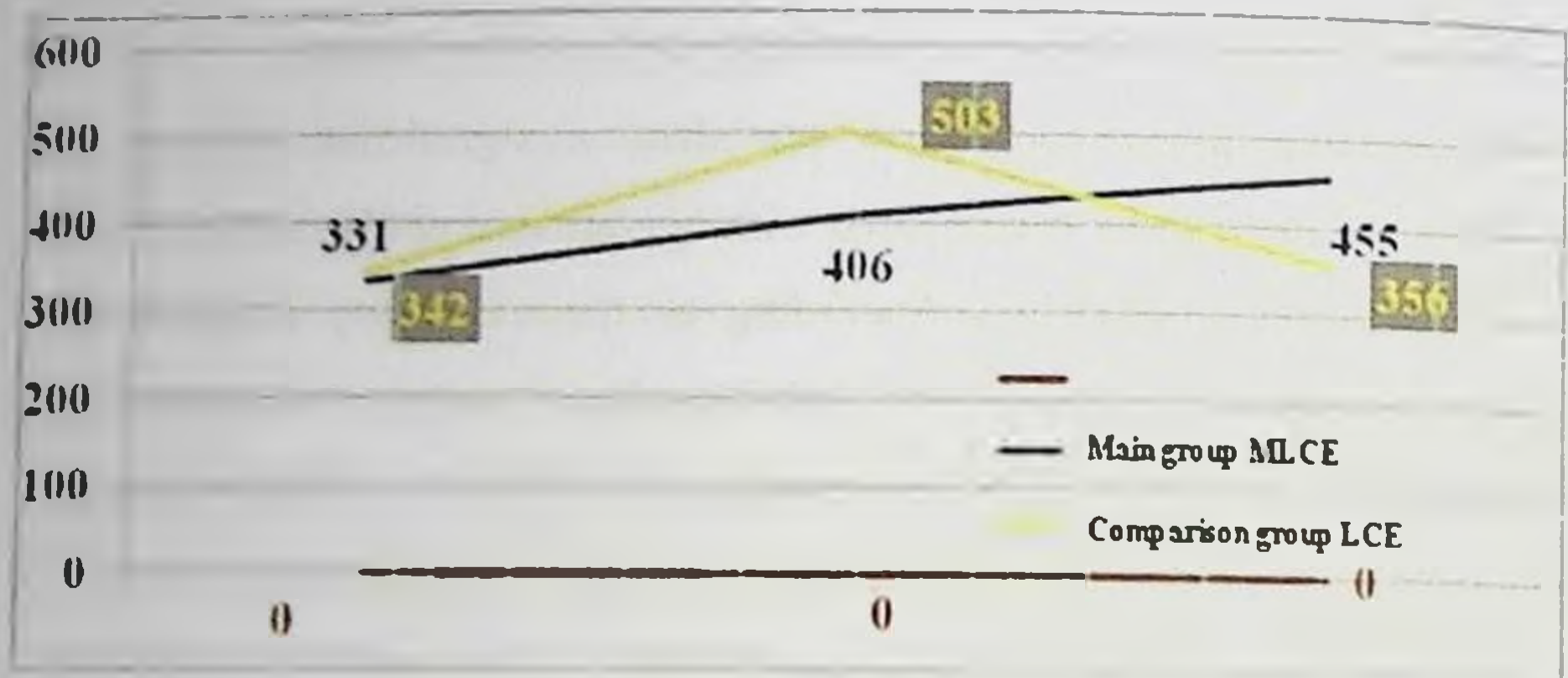


Figure 3.2. Cortisol levels at all stages of the study

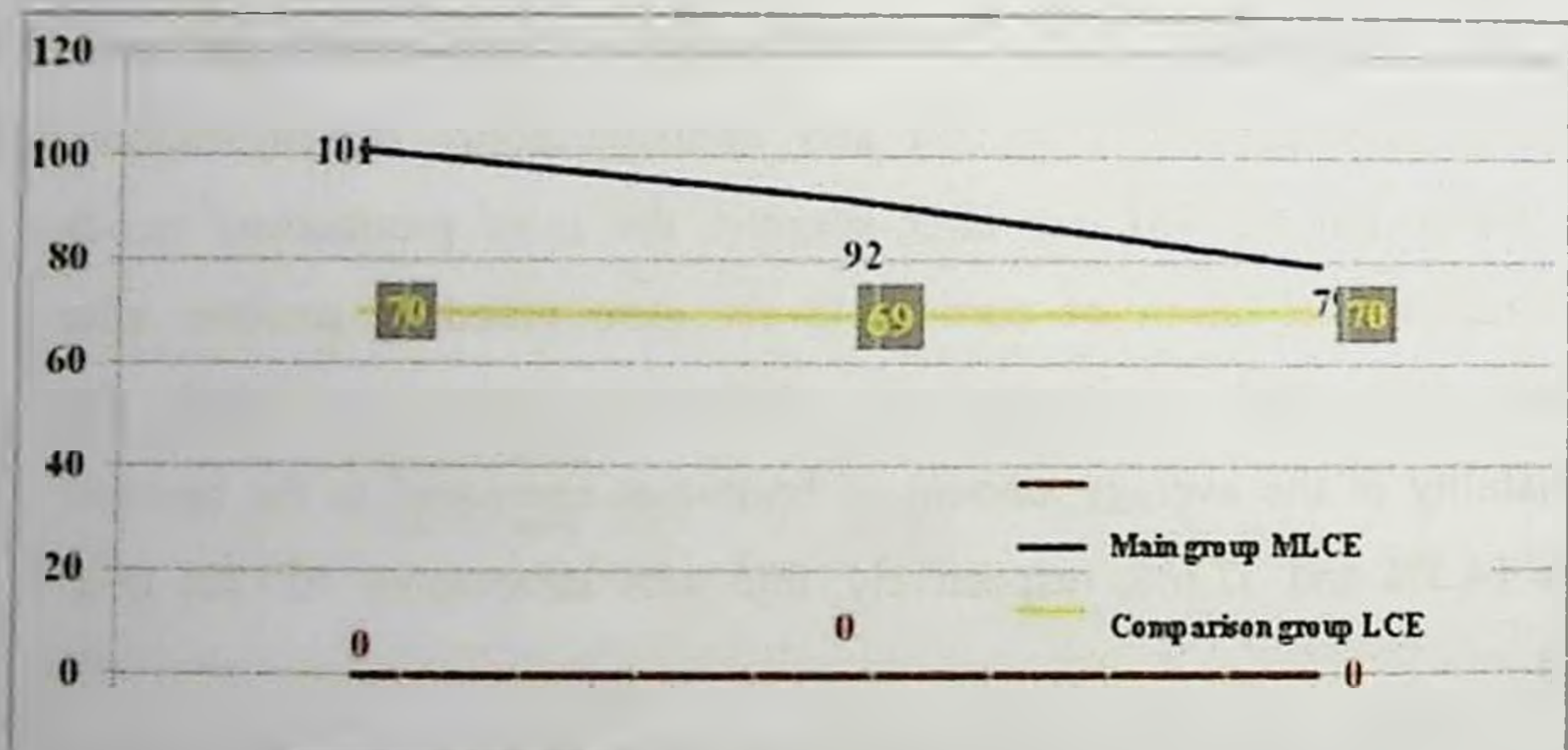


Figure 3.3. The T₄ level at all stages of the study

Changes in the concentration of TSH, the level of its deviation in comparison with the initial data is significantly higher with laparoscopic (+91.2%) and minilaparotomic operations (+71.6%) than with laparotomic

(+15.2%) cholecystectomies. After laparoscopic cholecystectomy, the percentage of deviation of the obtained data from the initial ones was significantly less (+11.2%) than during operations from minilaparotomic (+52.2%) accesses. After the operation, there was a tendency to increase TSH from laparotomy access (Fig. 3.4) and the degree of its deviation from the initial data was higher (+48.1%) than during the removal of the gallbladder (+15%).

The data of our studies allow us to conclude that with cholecystectomy from the mini-laparotomy access, there is an increase in the level of hormones during surgery, which is located in its severity between laparoscopic and laparotomic cholecystectomies.

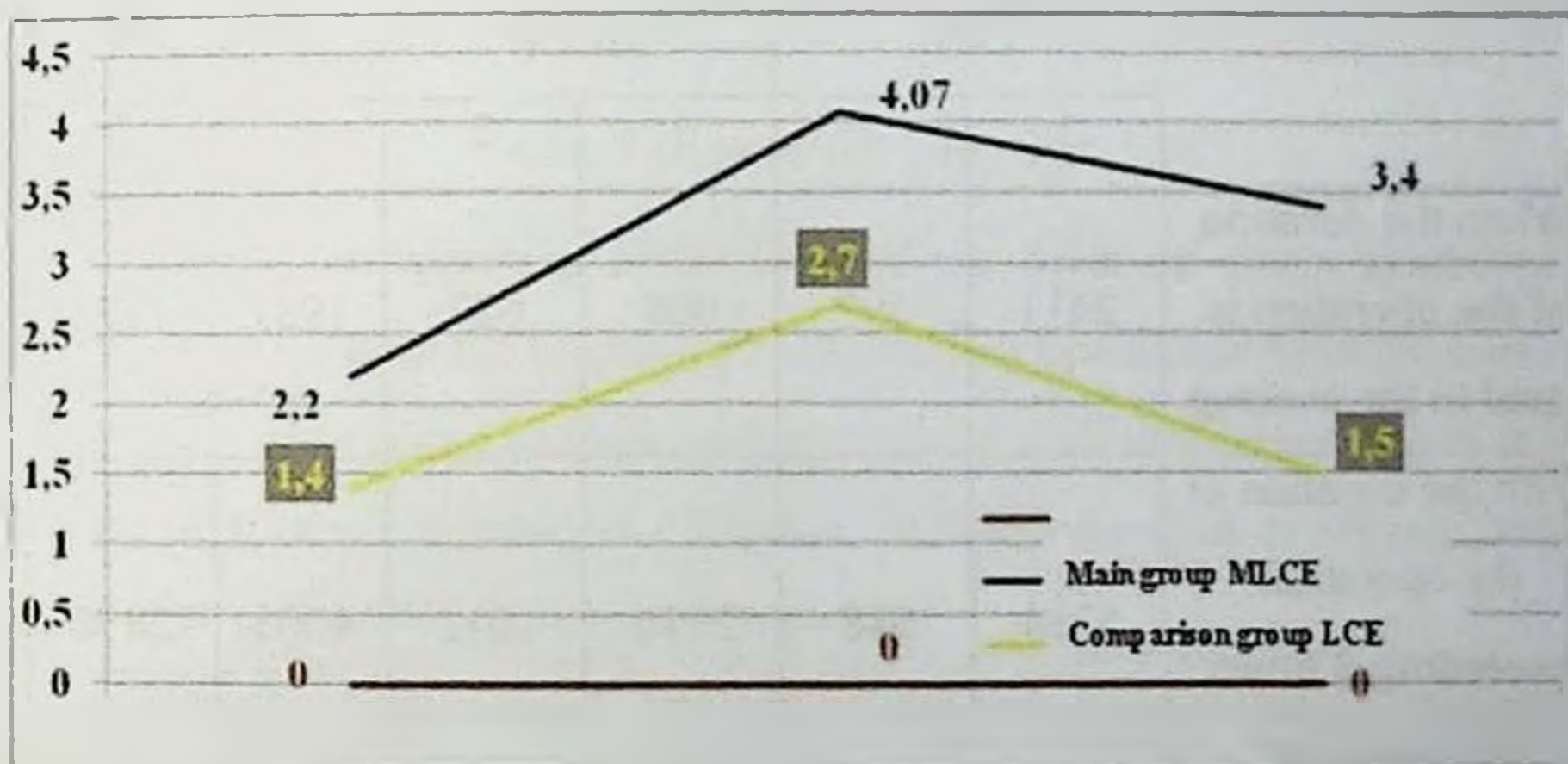


Figure 3.4. TSH level at all stages of the study.

A sharper rise in the level of certain hormones during laparoscopic cholecystectomy can be explained by the influence of a tense carboxyperitoneum, which in itself is quite a stressful factor associated with stretching of the peritoneum, rich in nerve endings. However, with laparoscopic cholecystectomy, the return to the initial level of stress

hormones occurs faster, which is apparently associated with less injury to muscle tissues during this operation.

At the same time, the study of the level of blood hormones revealed another feature. So it is noted that the longer the operation, the greater the fluctuations from the norm are noted. So if we take as a unit the performance of cholecystectomy from laparotomic access, then with prolonged laparoscopic or minilaparotomic cholecystectomy, the severity of the operation is equated. This dependence on the example of the prolactin level is reflected in Table 3.3.

Table 3.3.

The dependence of prolactin level on the duration of cholecystectomy

	LCE		MLCE		OCE	
	1	2	1	2	1	2
When the duration of the operation is equal to the average	2411	597	908	627	1981	1176
With the duration of the operation exceeding 2 times the average	5214	918	2110	1012	4605	2856

Note: 1 – intraoperatively; 2 – after surgery

As can be seen from Table 3.3, with the duration of LCE exceeding the average value by 2 times, the prolactin level after surgery exceeds its average value in the postoperative period, but at the same time approaches the prolactin level in the postoperative period after laparotomy cholecystectomy.

The conducted studies have shown that the most pronounced variability of most of the studied hormones in the direction of their increase occurred during laparoscopic cholecystectomy compared with traditional, but by the third day after surgery, after laparoscopic surgery, there was a faster return to the baseline level compared with the minilaparotomy and traditional methods ($p < 0.05$). In general, the comparison of the data obtained during the isolation and removal of the gallbladder with the minilaparotomy and laparoscopic methods was almost identical, but on the third day after the operation there was an advantage on the side of laparoscopic cholecystectomy, a faster return to the baseline level.

Conclusion of the chapter

Thus, a comparative assessment of the level of stress syndrome during operations on the biliary tract showed that operations from the mini-laparotomic access can be classified as minimally invasive according to the degree of surgical aggression. However, with the duration of surgery, the level of stress hormones increases in parallel.

Therefore, the optimal method of surgical intervention in patients with inflammatory diseases of the biliary tract with severe concomitant diseases (diseases of the cardiovascular system and chronic lung diseases, etc.), when laparoscopic cholecystectomy is contraindicated, is a mini-laparotomy access operation, which, according to our study, is less traumatic than the laparotomy method with an average duration of surgery.

CHAPTER IV.

SURGICAL TREATMENT OF PATIENTS WITH ACUTE DESTRUCTIVE CHOLECYSTITIS

Depending on the treatment tactics, the patients were divided into groups. In the period from 2017 to 2018, 82 (40.8% of 201) patients with acute destructive forms of cholecystitis underwent cholecystectomy by laparoscopic method and traditional wide access. They made up a comparison group.

From 2019 to 2021, 119 (59.2% of 201) patients with acute destructive cholecystitis underwent cholecystectomy by laparoscopic method and from minilaparotomy access. They made up the main group.

Surgical treatment of patients with acute destructive cholecystitis in the comparison group

In the comparison group, initially 43 (52.4% of 82) patients had cholecystectomy planned by laparoscopic method. Of these, only 23 patients had cholecystectomy completed by laparoscopic method, and 20 patients underwent conversion, i.e. cholecystectomy was completed by traditional wide access.

Laparoscopic cholecystectomy was performed with a set of instruments using a Karl Storz video laparoscopic rack (Germany) according to a standard 4-port technique: two 10-mm ports were inserted

above the navel and under the xiphoid process, two 5-mm ports were 2 cm below the edge of the right costal arch, one along the midclavicular line, the other along the anterior axillary. After a visual revision of the abdominal organs, the gallbladder was punctured and the area of the Calo triangle was isolated using monopolar coagulation. After identification of the common hepatic and common bile ducts, the cystic duct and artery were clipped and crossed separately. Having mobilized the gallbladder, its bed was coagulated.

The gallbladder was extracted through the umbilical trocar wound, the subhepatic space was necessarily drained through the trocar wound along the anterior axillary line.

The cause of conversion in 20 cases was associated with a pronounced destructive inflammatory process of the gallbladder wall and peripuzural fiber the causes of conversion are shown in Table 4.1.

In 15 cases, the conversion was caused by perivesical infiltration, of which intraoperative complications were detected in 5 cases, such as bleeding in 5 cases, excision of hepaticocholedocha in 1 case (the fate of a patient with excision of hepaticocholedocha after LCE is described in Chapter 5) and destruction of the integrity of the duodenal wall in 1 case. In 5 cases, the cause of the conversion was a perivesical abscess (Fig. 4.1).

In 39 (47.6% of 82) patients from the comparison group, cholecystectomy was planned with broad traditional access.

Traditional cholecystectomy was performed according to the standard procedure through an upper-median laparotomy or by performing an oblique incision of the tissues of the anterior abdominal wall in the right hypochondrium according to Kocher. Mobilization of the gallbladder was performed from the neck or from the bottom, depending on intraoperative

findings. The subhepatic space was necessarily drained through a contraperture in the right hypochondrium

Table 4.1

The reason for laparoscopic cholecystectomy conversion in the comparison group

Reason for conversion	Number of patients (n=20)	
	abs.	%
Perivesical infiltrate	15	75,0
Perivesical abscess	5	25,0
Intraoperative bleeding	5	25,0
Damage to hepaticocholedocha	1	5,0
Duodenal wall defect	1	5,0



Fig. 4.1. Intraoperative photo of patient M., 76 years old i/b № 5429/491. LCE conversion of TCE. Postoperative diagnosis: Acute calculous, occlusive gangrenous cholecystitis. Complication: Perivesical abscess.

Surgical treatment of patients with acute destructive cholecystitis in the main group

The tactics of treatment of patients in the main group differed from the comparison group in that the choice of optimal surgical access during cholecystectomy was more differentiated, and the access itself was less traumatic.

Successful radical surgery largely depends on the correctly chosen surgical access, which significantly affects the course of the operation, has a certain significance in the outcome of surgical treatment, and affects the course of the rehabilitation period.

Until 2019, when performing cholecystectomy for acute destructive cholecystitis, they mainly used exclusively traditional wide incisions of the anterior abdominal wall, which greatly facilitate the surgeon to perform the main stage of the operation, but still have a number of serious and well-known disadvantages - high traumatic intervention, increased risk of postoperative wound complications, unsatisfactory cosmetic results, a long period of early rehabilitation, etc. These circumstances prompted us to search for more gentle, less traumatic and at the same time convenient for the operator surgical access to the gallbladder and revision of the biliary tract.

As a result, since 2019, in acute destructive cholecystitis, we have begun to widely use the so-called "mini-stop", taking into account the individual peculiarity for each patient.

When choosing cholecystectomy by laparoscopic method or from minilaparotomy access, we focused on the results of preoperative diagnosis. Clinical signs of the course of acute cholecystitis were combined with ultrasound data.

Clinical signs of acute cholecystitis, concomitant somatic pathology, as well as ultrasound examination and diagnostic laparoscopy data were taken into account. We evaluated these factors that affect the results of treatment on a point scale (certificate of official registration of the computer program № DGU 10682, Agency for Intellectual Property of the Republic of Uzbekistan "Program for determining indications for surgical treatment of cholelithiasis") (Table 4.2, Figure 4.2).

The developed program for scoring the factors influencing the choice of surgery in patients with acute destructive cholecystitis allowed choosing the optimal method of surgery taking into account the individual characteristics of the body and improved the results of treatment.

Table 4.2

A point system for choosing methods of cholecystectomy

№	Factors influencing the choice of surgery	Characteristics of factors	Scores
1	Clinical signs of acute destructive cholecystitis	Has not	0
		Has	1
2	Signs of ultrasound	The thickness of the gallbladder wall	4
		< 3 mm	6
		3 – 5 mm	8
3	Diagnostic laparoscopy	> 5 mm	10
		Perivesical infiltrate	12
4	Concomitant pathology	Perivesical abscess	0
		Has not	8
		Cardiovascular diseases	6
		Chronic respiratory diseases	4
		Diabetes mellitus	2
		Fatness	

Table 4.2.

Distribution of patients of the main group depending on the clinical form of acute destructive cholecystitis and concomitant somatic pathology

Clinical forms of acute destructive cholecystitis	Concomitant somatic pathology								Without concomitant pathology	Total
	CHD	HD	COPD	DM	Adhesive disease of the abdominal cavity	Obesity of II-III degree	Pregnancy 2-3 trimester	2 or more comorbidities		
Acute phlegmonous cholecystitis without complications	7	12	4	2	1	3	1	14	14	58
Acute gangrenous cholecystitis without complications	5	2	-	1	2	1	-	9	3	23
Perivesical infiltrate	3	5	1	1	2	3	-	8	4	27
Perivesical abscess	-	1	-	2	-	1	-	2	2	8
Local peritonitis	-	-	-	2	1	-	-	-	-	3
Total	15	20	5	8	6	8	1	33	23	119

Note: - patients who scored from 0 to 5 points, they produced LCE:

- patients who scored more than 5 points, they produced MLCE.

According to the developed point scale, we recommend laparoscopic cholecystectomy to patients who scored from 0 to 5 points and to patients who scored above 5 points, we recommend cholecystectomy through minilaparotomy access (Table 4.3).

In the main group of patients, cholecystectomy was initially planned for 47 (39.5% of 119) patients by laparoscopic method, but due to the complexity of continuing the operation and according to diagnostic laparoscopy data, 9 (19.1%) patients out of 47 patients scored above 5 points, they underwent conversion. The reason for the conversion is shown in Table 4.4.

Table 4.4.

The reason for the conversion of laparoscopic cholecystectomy in the main group

Reason for conversion	Number of patients (n=9)	
	abs.	%
The duration of the operation is more than 30 minutes.	3	77,8
The cystic and common bile duct are not identified	3	44,4
A wide cystic duct with a thickened wall is identified, there is a danger of the clip slipping off	2	22,2
Bleeding	1	11,1

As can be seen from Table 4.4, the cause of conversion in 3 patients was the duration of identification of the cystic duct and the main bile ducts for more than 30 minutes, in 3 more patients, due to dense infiltration in the subhepatic region, it took more than 30 minutes to identify the wall of the gallbladder (Fig. 4.2 - 4.3). In 2 cases, according to the developed

program. patients scored more than 5 points according to diagnostic laparoscopy, they had a danger of clips slipping due to a wide cystic duct with a thickened wall. In 1 case, the conversion was caused by bleeding from the vesicular artery with a favorable outcome.



Fig.4.2. Stages of diagnostic laparoscopy (patient Sh. 43 years old, i/b 6291/538). The duration of identification of the cystic duct and the main biliary tract was more than 30 minutes



Figure 4.3. Transition to cholecystectomy from the bottom of the mini access (patient Sh. 43 years old, i/b 6291/538).

72 (60.5% of 119) patients, taking into account the clinical signs of the course of acute cholecystitis, the existing concomitant somatic

pathology and ultrasound data, cholecystectomy was performed through a minilaparotomy access.

Thus, in the main group of patients, 38 (31.9% out of 119) patients underwent cholecystectomy by laparoscopic method and 81 (68.1% out of 119) patients with acute destructive cholecystitis underwent cholecystectomy through minilaparotomy access (Table 4.4).

Table 4.5.

Distribution of patients of the main group depending on the method of cholecystectomy

Cholecystectomy method	Total, n=119	
	abs.	%
Laparoscopic cholecystectomy	38	31,9
Cholecystectomy from minilaparotomy access	81	68,1

In the main group of patients, MLCE was carried out in terms of more than 72 hours from the onset of the disease, and at the beginning of the operation, attempts were made to standard surgery methods, and when technical difficulties arose, they sought to perform non-standard methods of MLCE.

Of 81 patients with acute destructive cholecystitis, standard MLCE was performed in 43 (53.1%) patients; MLCE from the bottom – in 27 (33.3%) patients, of which 6 (22.2%) had gallbladder amputation and 8 (29.6%) had cholecystectomy performed by the Fedorov method due to dense infiltration in the neck of the gallbladder and the danger of damage to hepaticocholedoch; MLCE according to the Device – in 11 (13.6%) patients (Fig. 4.4).

In the technique of performing MLCE from the bottom, the following stages were envisaged: opening the lumen of the gallbladder and removing its contents; crossing the gallbladder along the border of the body and neck; removal of the walls of the body and the bottom of the gallbladder; removal of the walls of the neck of the bladder and the cystic duct; completion of the operation.

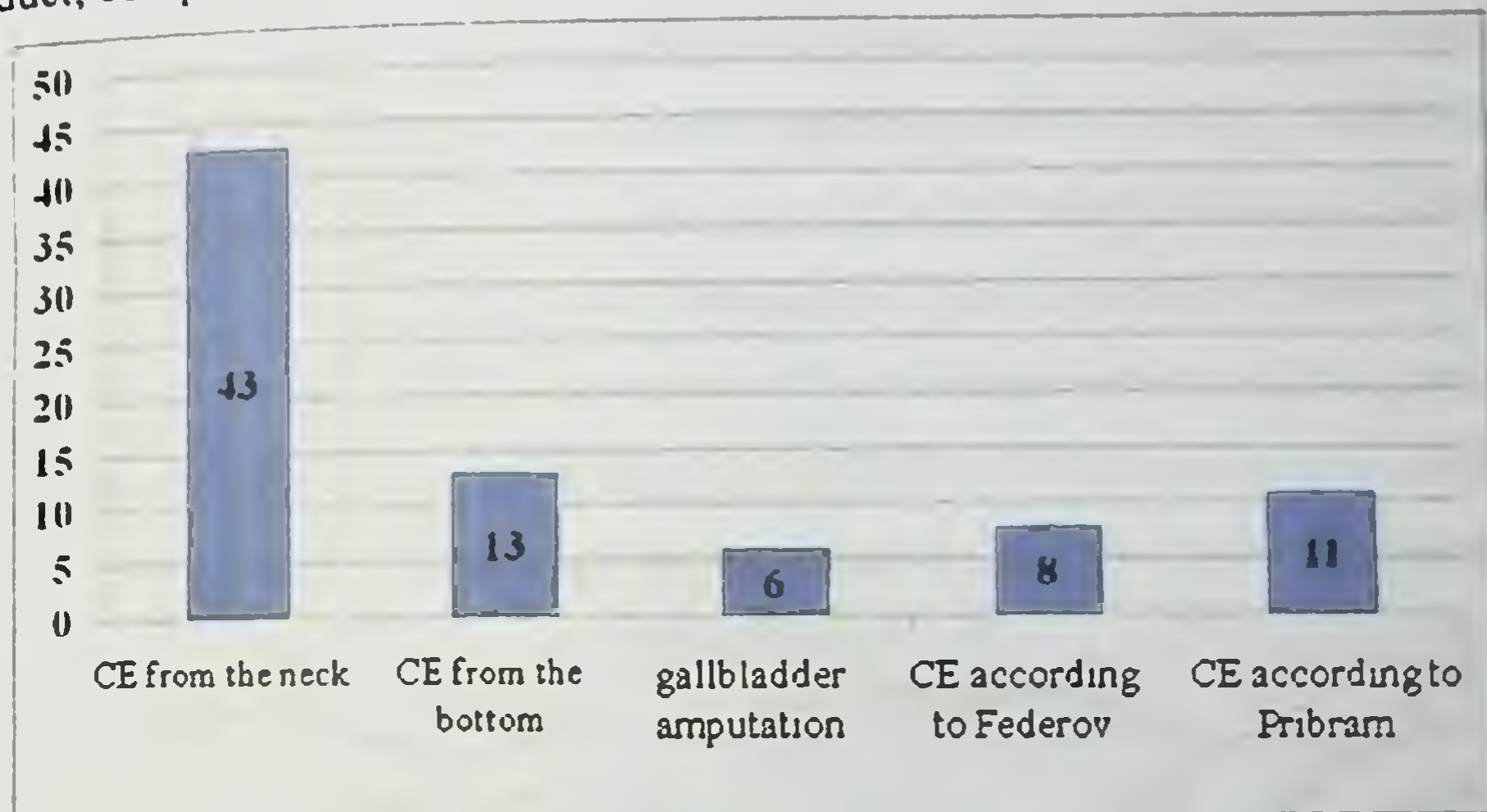


Figure 4.4. Distribution of patients in the main group depending on the performed method of cholecystectomy from the mini-laparotomy access

In particularly difficult situations, when there are significant technical difficulties in isolating the gallbladder from the surrounding tissues due to extensive fibrotic scar changes, radical isolation of the walls of the organ is fraught with iatrogenic damage to significant anatomical formations, a high probability of bleeding from the bed of the gallbladder. In such situations, cholecystectomy was completed by amputation of the

gallbladder or CE was performed according to the method of S.P. Fedorov (1904).

The essence of the operation according to S.P. Fedorov is the longitudinal opening of the lumen of the gallbladder, the insertion of a finger there and the gradual excision (with scissors or scalpel) of the walls of the organ from the bottom to the neck (Fig. 4.5). A particularly dangerous moment of the operation is the isolation of the neck of the gallbladder, sealed in the infiltrate. It must be remembered that large vessels are located behind it, and on the side, at the beginning of the cystic duct, hepaticocholedoch can be soldered. In this regard, the neck was isolated with extreme caution, as close as possible to the walls of the bladder and the cystic duct. All manipulations were performed under the control of the finger of the left hand inserted into the gallbladder cavity.



Figure 4.5. Atypical cholecystectomy according to S.P. Fedorov
(source of the picture Emergency surgery of the biliary tract // Guide for doctors // Edited by Professor P.G. Kondratenko, Donetsk – 2005. Page 318).

In the main group of patients in 11 cases, the main difficulty was that it was impossible to identify not only the neck, but also the part of the gallbladder adjacent to the liver. Separate from the liver without significant damage to its parenchyma and as a result of intense bleeding. In order to avoid this complication, the operation of choice was considered MLCE with mucoclasia according to Pribram (1928). The following surgery technique was used.

Along the midline at the border of the body and the bottom of the gallbladder, using straight scissors curved along the edge, its cavity was opened longitudinally. The length of the incision of the gallbladder wall, if necessary, was increased towards the neck. The concretions were captured with a compressed clamp and removed in stages. Then the walls of the gallbladder were excised along the border of the splices. Excision of free sections of the gallbladder wall was performed along the border of the line at the level of which tissue differentiation was lost. Hemostasis, coagulation with stitching of the branches of the vesicular artery. Then mucoclasia was performed. The use of electrocoagulation was considered the best option. It was produced from the bottom up, by linear parallel movements of the ball electrode in the coagulation mode. The uniformity and depth of mucosal coagulation were visually controlled by conducting exposure to the subserous layer. The last stage of the cystic duct was carefully examined for the presence of nodules in it. A safety drainage tube was installed in the subhepatic region according to the standard procedure (Fig. 4.6).

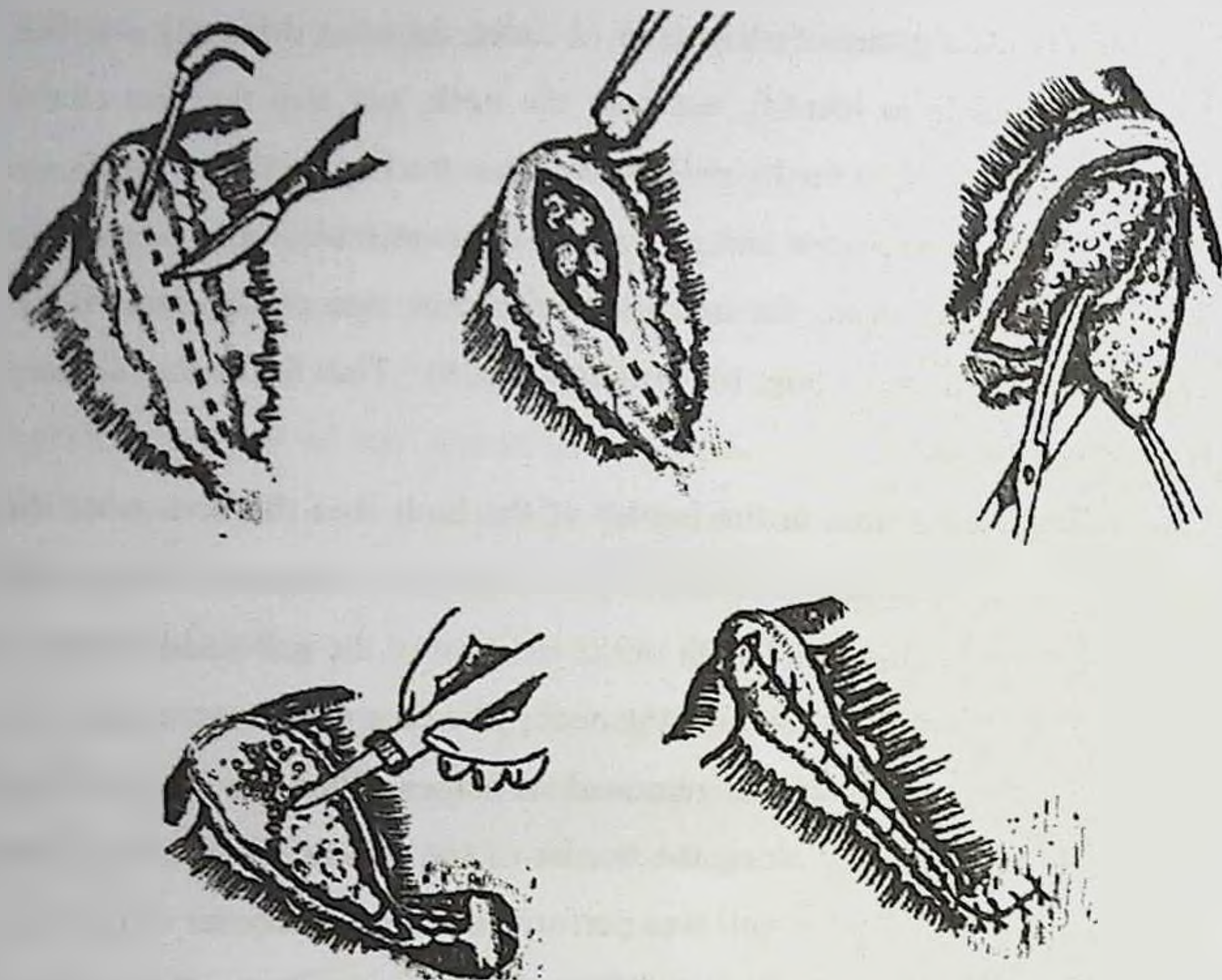


Figure 4.6. Atypical cholecystectomy according to the Device
(source of the picture *Emergency surgery of the biliary tract // Guide for doctors // Edited by Professor P.G. Kondratenko, Donetsk – 2005. page 320*).

Comparative indicators of the duration of the operation in minutes, depending on the attempted access, are shown in Figure 4.7. A significant difference was also noted for these values ($p < 0.001$).

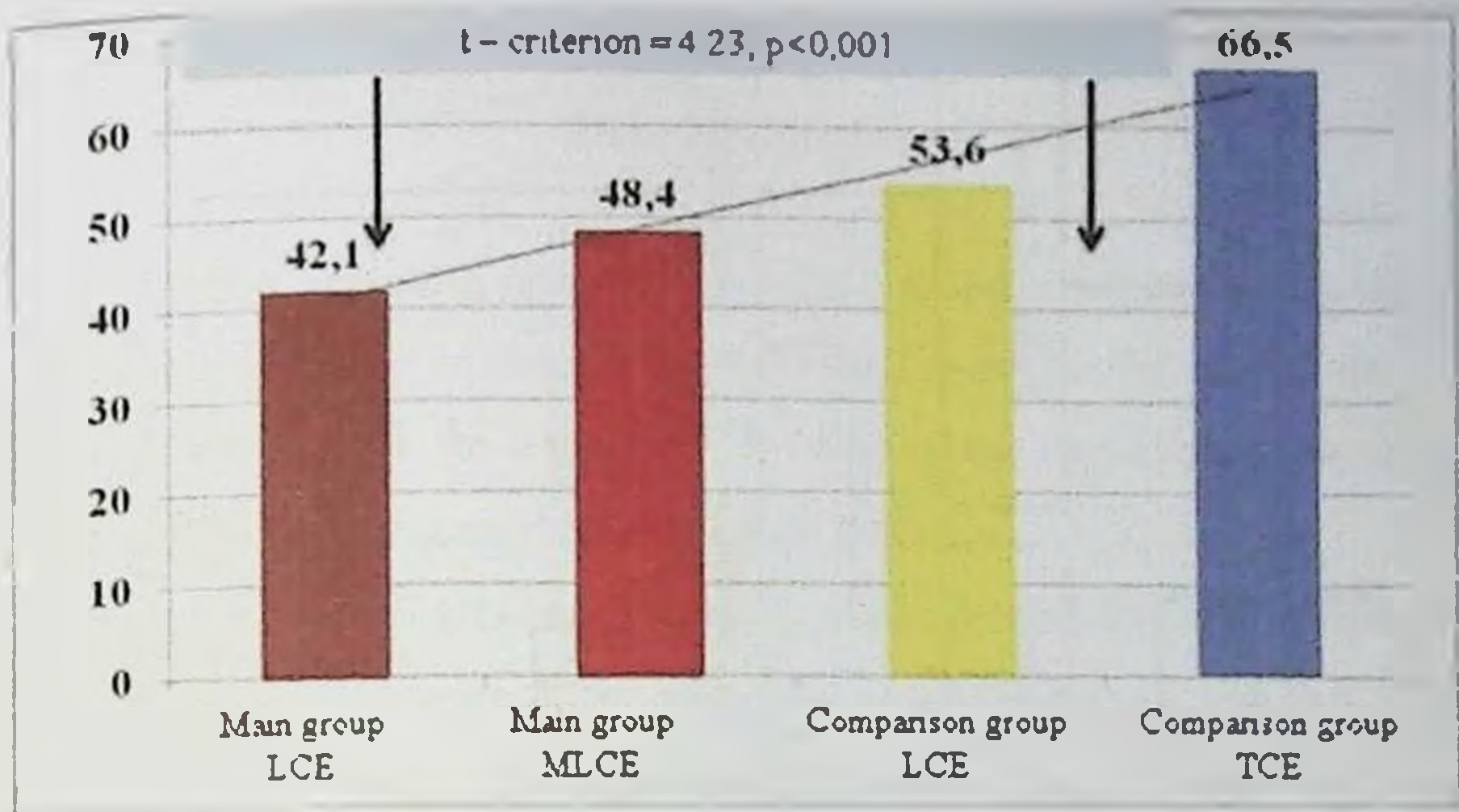


Fig. 4.7. Comparative indicators of the duration of the operation (min) depending on the attempted method of cholecystectomy

Thus, the proposed program for choosing methods of cholecystectomy in patients with acute destructive cholecystitis with a score assessment of the severity of the disease, taking into account the clinical signs of the disease, ultrasound and diagnostic laparoscopy data, allowed to reduce the duration of the operation from 66.5 ± 4.9 to 42.1 ± 2.9 minutes (t -criterion = 4.23; $p < 0.001$).

Based on the clinical course of the disease and the program for determining the choice of surgical tactics for acute destructive cholecystitis, we have developed and implemented in clinical practice an optimal therapeutic and tactical algorithm for managing patients with acute destructive cholecystitis (Fig. 4.8).

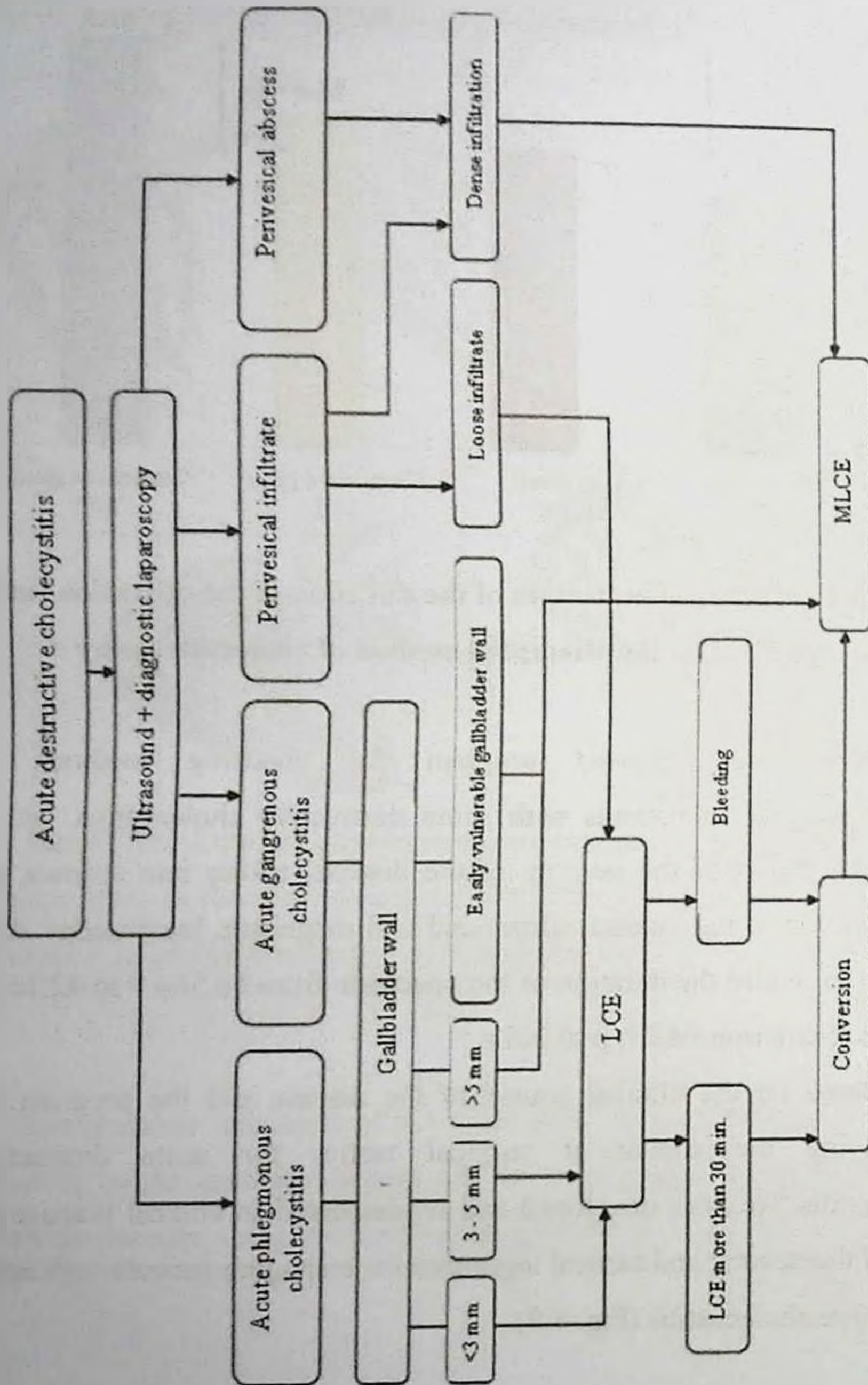


Figure 4.8. Therapeutic and tactical algorithm for the management of patients with acute destructive cholecystitis

Improving the technical aspects of cholecystectomy from mini access

Another important innovative solution aimed at increasing the angle of operational action with topical mini-access is to use the capabilities of the wound expander for a thorough revision of the hepatobiliary system, which allows you to inspect hard-to-reach places.

The surgical tactics and technique of performing the main stages of cholecystectomy did not differ from the generally recognized one. The operations from minilaparotomy were performed using a wound expander device developed by us (certificate of official registration of utility model No. FAP 01385, Agency for Intellectual Property of the Republic of Uzbekistan "Wound Expander").

The objective of the proposed device is to simplify, increase convenience and reduce injury during use. To solve the tasks set, we offer a wound expander containing a ring and fasteners attached to it, with channels fixed on the blades for bringing the drainage element and the light guide, characterized in that the wound expander is equipped with a handle, an additional ring, clamps, a hinge mechanism, the blades are connected to the hinge mechanism using rivets.

A comparative analysis with the prototypes shows that the device differs in that the wound expander is equipped with a handle, an additional ring, clamps, a hinge mechanism, the blades are connected to the hinge mechanism using rivets. These distinctive features indicate the novelty of the technical solution.

The connection of the blades with the hinge mechanism improves the reliability of fixation.

The essence of the utility model is explained by the drawings. Figure 4.9. shows a wound expander for cholecystectomy from a mini-laparotomy access in the initial position and shows the type of device in operation

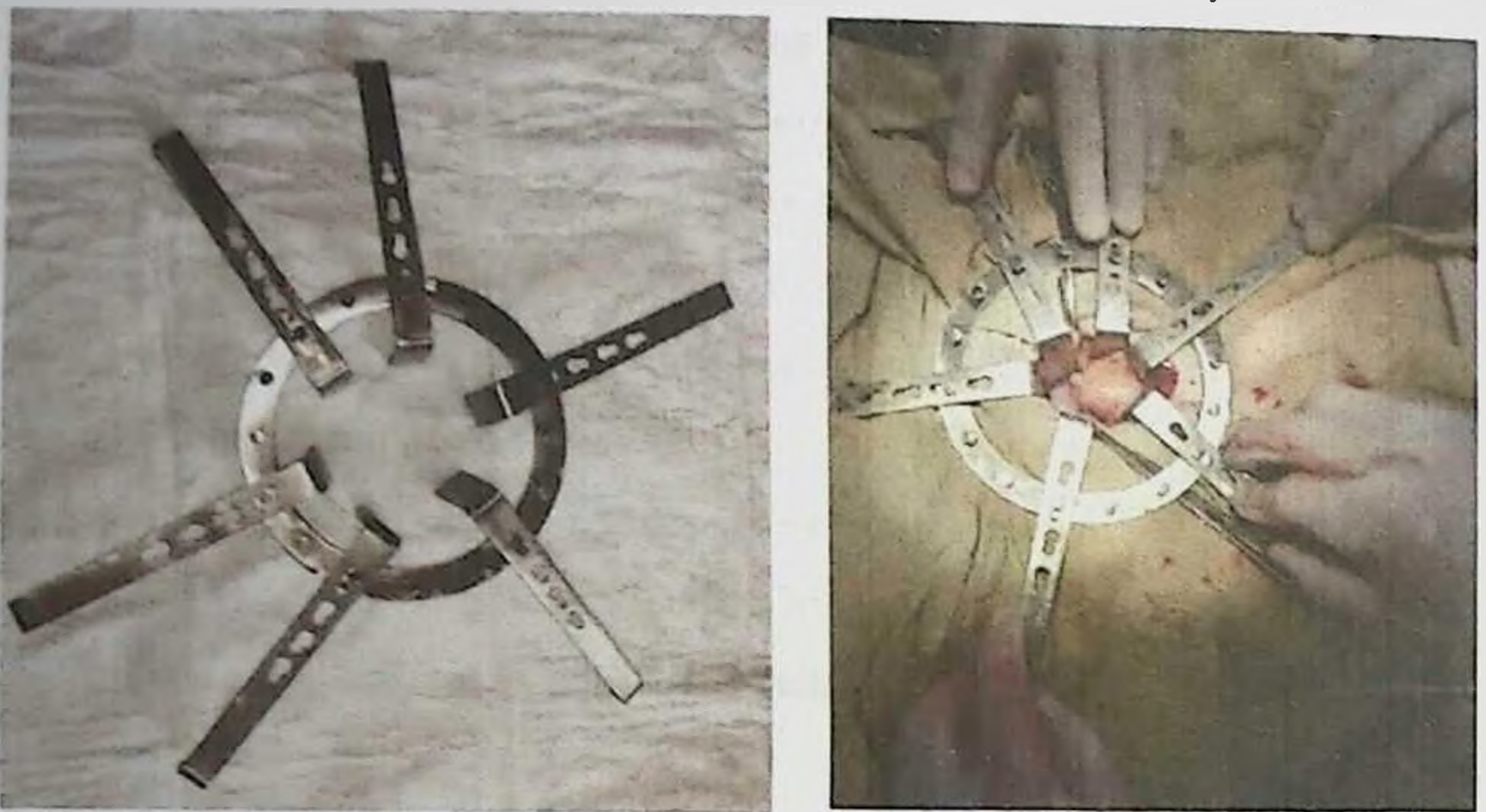


Fig. 4.9. Image of the proposed wound dilator for cholecystectomy from mini access (intraoperative photos)

After processing the elements of the neck of the gallbladder, the latter was removed subserously using an electrosurgical hook from the neck, from the bottom or in a combined way. Hemostasis in the bladder bed was performed using electrocoagulation and then the wound dilator was brought to its original position using the handle. The subhepatic space was necessarily drained through a contraperture in the right hypochondrium. The wound was sutured tightly in layers.

The device is convenient, simple and low-traumatic in use. It is recommended for wide use in practical medicine to expand the area of surgery.

Clinical example:

Patient Z., 49 years old, I b No. 9022/2025, was admitted to the clinic on 16.12.2019 with complaints of pain in the right hypochondrium, nausea, vomiting. Sick for 3 days. He associates his illness with overeating fatty foods. In the anamnesis, I noted several times attacks of similar pains in the right hypochondrium. On ultrasound, gallbladder concretions have been noted since 2016.

The general condition of the patient at the admission of moderate severity, the skin is subicteric. Auscultatively, vesicular breathing is heard in the lungs on both sides, there are no wheezing. The heart tones are clear, rhythmic. The tongue is a little dry, overlaid with plaque. The abdomen is of the usual shape, participates in the act of breathing, when palpation, muscle tension is noted in the right hypochondrium, the bottom of a painful, enlarged gallbladder is palpated under the rib. Murphy and Ormer-Grekov's symptoms are positive. The liver and spleen are not palpable. A chair of ordinary color. Urination is free.

General blood test: Hb-96 g/l, er.- $3.4 \times 10^{12}/\text{ml}$, F-0.8, thrombus-230, l.- $9.7 \times 10^9/\text{ml}$, VSK-3'50"-4'00", P.-3%, S.-65%, eoz.-1%, lymph.-20%, mon.-7, ESR-25 mm/h, Ht-24.

Biochemical blood test: bil.-19.65 mmol/l, straight.-14.27 mmol/l, ALT-0.96 mmol/l, AST-0.86 mmol/l, tim.pr.-2, urea.-4.66 mmol/l, ost.nitrogen-17 g/l, creatine-82.9 mmol/l, total.protein-70.5 g/l.



Fig. 4.10. Ultrasound of the gallbladder and biliary tract of patient Z., 49 years old.

Chest X-ray: pathology not detected.

Ultrasound: the gallbladder is 15x8cm, concretions with a diameter of up to 1 cm are detected in the lumen, one concretion is wedged into the neck of the gallbladder (Fig. 4.12).

With a clinical diagnosis: "Acute destructive calculous cholecystitis", the patient was operated on 17.12.2019. Under endotracheal anesthesia, cholecystectomy was performed according to the Device through a minilaparotomy access. A skin incision was made in the right hypochondrium with a length of 5 cm transrectally. After opening the abdominal cavity, the wound was expanded with a wound expander proposed by us. During the revision of the abdominal cavity, a large omentum is soldered to the gallbladder, loose adhesions are separated by sharp and blunt ways, the wall of the duodenum is tightly soldered to the area of the Hartmann pocket and to the neck of the gallbladder, hepaticocholedoch is not identified. The gallbladder is 15×6 cm in size. To isolate the neck of the gallbladder and try to identify the cystic duct from hepaticocholedoch is fraught with dangerous damage to the hollow organ or tubular structures. In this connection, the bottom of the gallbladder was opened and the wall of the bladder was dissected to a dense infiltration, concretions and thick bile with an admixture of pus were removed from the lumen of the gallbladder. Next, a cholecystectomy was performed according to the Device (Fig. 4.13 – 4.14). The subhepatic area is drained. The abdominal cavity is drained and stitched tightly in layers, stitches on the skin, iodine, alcohol, aseptic dressing.

The course of the postoperative period is smooth, wound healing by primary tension. From the drainage tube on the first day there was serous-hemorrhagic fluid in an amount of up to 5 ml. The drainage tube was

removed on the second day after the operation. The patient was discharged home in a satisfactory condition on the fourth day after the operation (12/21/2019).

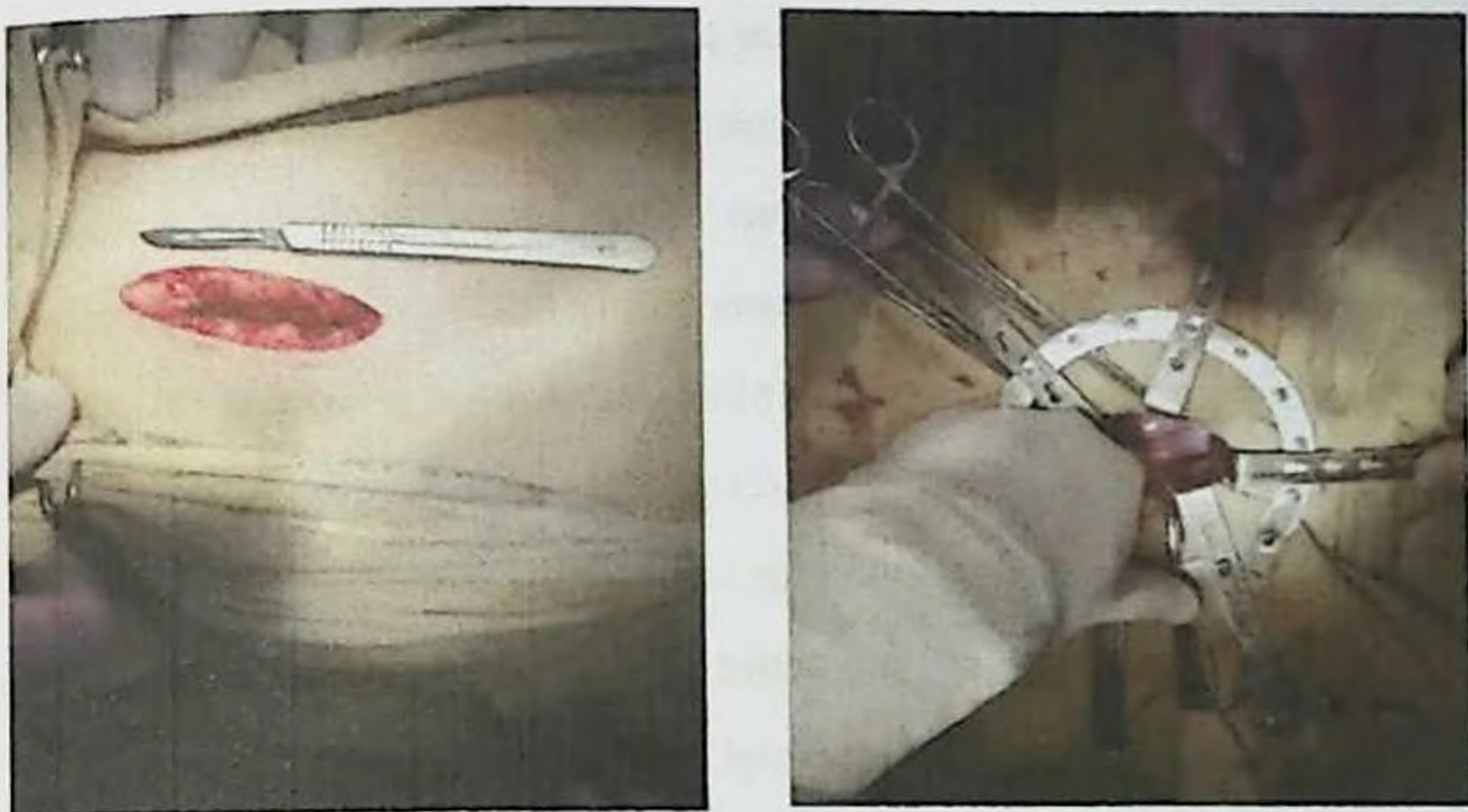


Fig. 4.11. Stages of cholecystectomy according to a Device from a mini-laparotomy access using an improved wound dilator (patient Z., 49 years old).



Fig. 4.12. Macro-preparation of the removed gallbladder with concretions and postoperative wound after mini-access (Patient Z., 49 years old).

Conclusion of the chapter

In the surgery of acute destructive cholecystitis since 2019, we have begun to widely use the so-called «mini-stop», taking into account the individual characteristics for each patient. When choosing cholecystectomy by laparoscopic method or from minilaparotomy access, we focused on the results of preoperative diagnosis. Clinical signs of the course of acute cholecystitis were combined with ultrasound data.

A program has been developed for scoring the factors influencing the choice of surgery in patients with acute destructive cholecystitis, which made it possible to choose the optimal method of surgery taking into account individual characteristics of the body and improved the results of treatment.

According to the developed point scale, we recommend laparoscopic cholecystectomy to patients who scored from 0 to 5 points and to patients who scored above 5 points, we recommend cholecystectomy through minilaparotomy access.

In the main group of patients, MLCE was carried out in terms of more than 72 hours from the onset of the disease, and at the beginning of the operation, attempts were made to standard surgery methods, and when technical difficulties arose, they sought to perform non-standard methods of MLHE.

Of 81 patients with acute destructive cholecystitis, standard MLCE was performed in 43 (53.1%) patients; MLCE from the bottom – in 27 (33.3%) patients, of which 6 (22.2%) had gallbladder amputation and 8 (29.6%) had cholecystectomy performed by the Fedorov method due to

dense infiltration in the neck of the gallbladder and the danger of damage to hepaticocholedoch; MLCE according to the Device – in 11 (13.6%) patients.

Thus, the proposed program for choosing methods of cholecystectomy in patients with acute destructive cholecystitis with a score assessment of the severity of the disease, taking into account the clinical signs of the disease, ultrasound and diagnostic laparoscopy data, allowed to reduce the duration of the operation from 66.5 ± 4.9 to 42.1 ± 2.9 minutes.

Another important innovative solution aimed at increasing the angle of operational action with topical mini-access is to use the capabilities of the wound expander for a thorough revision of the hepatobiliary system, which allows you to inspect hard-to-reach places.

The proposed device is convenient, simple and low-traumatic in use. It is recommended for wide use in practical medicine to expand the area of surgery.

CHAPTER V.

RESULTS OF SURGICAL TREATMENT OF PATIENTS WITH ACUTE DESTRUCTIVE CHOLECYSTITIS

Results of surgical treatment in the early postoperative period

The results of surgical treatment of patients with acute destructive cholecystitis were evaluated according to the following indicators: the course of the postoperative period, the timing of drainage removal, the presence of bile discharge from drains, the nature of wound healing, the patient's hospital stay (bed-day), duration of surgery (min), duration of temperature (day), ultrasound signs of intraperitoneal ulcers, subhepatic biloma and gallbladder peritonitis, residual gallbladder stump stones or forgotten choledoch stones.

Improving the choice of surgical treatment tactics for patients with acute destructive cholecystitis, techniques for performing surgical intervention, reducing the traumatic nature of surgical access and other innovations developed and implemented within the framework of this study could not but affect the immediate results of management of this category of patients. Thus, in comparison with 2017-2018, the frequency of postoperative complications decreased from 13.4 to 1.7%, i.e. by 8 times (Table 5.1). Complications such as bile discharge began to occur much less

frequently (5 times), there were no such formidable complications as biliary peritonitis and damage to the bile ducts.

When studying the frequency of local complications in our work, we took into account only those complications that were accompanied by a significant deterioration in the patient's condition, posed a threat to his life and required active conservative or surgical treatment.

Local postoperative complications included damage to the biliary tract, bile drainage through the abdominal cavity, massive bleeding from the abdominal cavity, infectious intra-abdominal complications (abdominal abscesses).

The frequency of damage to hepaticocholedocha in acute cholecystitis complicated by dense infiltration during standard LCE was observed by us in 1 out of 23 patients (4.3%) of the comparison group. The comparative characteristics of other local complications after CE by various methods in the study groups are presented in Table 5.1.

As follows from the data in Table 5.1, the frequency of local complications after CE in the comparison group was observed in 11 (13.4%) of 82 patients. This indicator was significantly higher than in patients of the main group, i.e. in 2 (1.7%) of 119 patients. In the main group of patients after LCE, after standard and non-standard MLCE, such formidable complications as damage to the hepaticocholedoch were not observed.

Table 5.1

The frequency of postoperative complications in patients after cholecystectomy

Type of complication	Group of patients										Total. n=201	
	Comparison group (n=82)			Main group (n=119)								
	condition after LCE (n=23)		condition after TC.E. (n=59)	condition after LCE (n=38)		condition after MLCE. (n=81)						
abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	
Bile drainage	1	4.3									1	0.5
	2	8.7									2	0.9
			1	1.7							1	0.5
			2	3.4			1	1.2*			3	1.5
Biloma in the subhepatic region	1	4.3			1	2.6				2	0.9	
Biliary peritonitis			1	1.7						1	0.5	
Bleeding	1	4.3								1	0.5	
Suppuration of a postoperative wound			2	3.4						2	0.9	
Total complications	5	21.7	6	10.2	1	2.6**	1	1.2		13	6.5	
Number of patients with complications	4	17.4	5	8.5	1	2.6	1	1.2		11	5.5	
Criterion χ^2	Df=1: $\chi^2 = 4.954$: p=0.027											

Note: * - differences with respect to the control group data are significant (* - $P < 0.05$. ** - $P < 0.001$).

The analysis of methods of treatment of local complications in patients with acute destructive cholecystitis, after CE in various ways in the study groups, is presented in Table 5.2.

As can be seen from the data in Table 5.2, in one case, intraoperative damage to the hepaticocholedoch was detected in the comparison group. This patient underwent conversion, due to a pronounced inflammatory process in the liver gate, external drainage of the hepaticocholedoch stump was limited. In 2 patients of the comparison group after LCE, bile discharge was noted due to the slipping of clips from the stump of the cystic duct. In one of them, due to partial slipping of the clip, dynamic observation was carried out, the flow rate of bile through the drainage tube from the subhepatic region per day was up to 50 ml, followed by a decrease, and on day 12, bile flow stopped after a control ultrasound, the drainage tube was removed on day 13 after surgery.

Another patient needed a laparotomy to stop bile flow. This patient had severe pain in the right hypochondrium, the flow rate of bile through the drainage tube from the subhepatic region was up to 400 ml per day, in addition, an ultrasound in the subhepatic region revealed an accumulation of bile. In 3 patients after CE, bile discharge was observed from a wide access due to the failure of the stump of the cystic duct in one case and from the Lyushko passages in 2 cases. Only in one case, repeated intervention with the stitching of Lyushko's moves was required, and the remaining two patients underwent conservative treatment with dynamic observation.

Table 5.2.

Methods of treatment of local complications after cholecystectomy in the study groups

Study groups	Type of complication	Treatment method			
		Conservative	Conversion, external drainage of the GC stump	Laparotomy	Puncture drainage under ultrasound control
Comparison group (n=82)	Bile discharge		1		
		damage to hepaticocholedocha after LCE (n=1)			
		due to the slipping of clips from the stump of the cystic duct after LCE (n=2)	1		1
		due to the failure of the stump of the cystic duct after TCE (n=1)	1		
	of Lyushko's moves after TCE (n=2)	1		1	
	Biloma in the subhepatic region after LCE (n=1)				1
	Biliary peritonitis after TCE (n=1)			1	
Main group (n=119)	Bleeding after LCE (n=1)			1	
	Suppuration of the postoperative wound after TCE (n=2)	2			
	Bile discharge from Lyushko's moves after MLCE (n=1)	1			
Total	Biloma in the subhepatic region after LCE (n=1)				1
		6	1	4	2

The clinical picture of diffuse biliary peritonitis developed in 1 patient with insufficiency of the cystic duct stump after performing standard TCE, which required laparotomy, sanitation and drainage of the abdominal cavity with additional ligation of the cystic duct. In 1 observation, a patient from the comparison group after standard LCE had a large (more than 100 ml per day) amount of blood released through the drainage of the abdominal cavity. A laparotomy was performed with the removal of a subhepatic hematoma and with ligation of the failed stump of the vesicular artery. In 2 cases (from each study group), the formation of biloma in the subhepatic region was observed, in both cases the biloma was drained under ultrasound control and subsequently resolved conservatively. One patient from the main group had bile discharge from Lyushko's passages, which also resolved conservatively. In 2 cases, suppuration of the postoperative wound was observed after TCE. The wound healed with secondary sutures after treatment with antiseptics.

The expansion of indications for topical mini-access did not negatively affect the duration of surgical intervention. On the contrary, this indicator has decreased. The duration of inpatient treatment after surgery decreased by 2 times compared to the control – from 7.2 ± 1.2 to 5.9 ± 0.3 days.

A decrease in the traumatic nature of surgical access with early activation of operated patients contributed to a twofold reduction in the duration of postoperative rehabilitation.

Compared with previous years of work with patients with acute destructive cholecystitis, we have significantly reduced the indications for cholecystectomy from the traditional wide access. This circumstance, combined with a decrease in the frequency of early postoperative

complications had a positive effect on the frequency of discharge of patients from the hospital – this indicator decreased by 5 times (Table 5.3).

Table 5.3.

The course of the postoperative period in patients after cholecystectomy

Group of patients		Number of bed days			
		total	before the operation	ICU	after the operation
Comparison group	condition after LCE (n=23)	6,4±1,2	1,3±0,3	2,1±0,1	3,2±1,2
	condition after TCE, (n=59)	12,4±0,6***	2,0±0,3**	3,7±0,1**	7,4±0,5***
Main group	condition after LCE (n=38)	5,4±1,2	1,3±0,3	1,1±0,1	2,2±1,2
	condition after MLCE, (n=81)	6,2±0,3***^	1,2±0,2**	1,8±0,1*	4,9±0,3*** ^^
Total, n=201		6,9±0,7	2,5±0,2	2,2±0,1	7,4±0,5

Note: * - differences relative to the data of the 1st subgroup of the comparison group are significant (* - P<0.05, ** - P<0.01, *** - P<0.001), ^ - differences relative to the data of the 2nd subgroup of the comparison group are significant (^ - P<0.05, ^^ - P<0.001)

Long-term results of surgical treatment of patients with acute destructive cholecystitis

The long-term results were analyzed in 129 (64.2%) of 201 operated patients for acute destructive cholecystitis (Table 5.4).

Table 5.4.

**Terms of studying long-term results in operated
patients, abs. (%)**

Group of patients		Total operated	Long-term results have been studied
Comparison group	condition after LCE	23	14 (60,9)
	condition after TCE	59	36 (61,0)
Main group	condition after LCE	38	21 (55,3)
	condition after MLCE	81	58 (71,6)
Total		201	129 (64,2)

To assess the long-term results, patients were subjected to a thorough questionnaire, outpatient and inpatient examination. Long-term results were studied in terms from 1 to 3 years. Approximately equal shares (60.9, 61.0, 55.3 and 71.6%) in the structure of patients examined in the long-term period are representatives of the groups compared with each other.

Table 5.5.

Frequency of postcholecystectomy syndrome in the study groups

Type of PCES	Group of patients									
	Comparison group (n=50)				Main group (n=79)				Total. n=129	
	condition after LCE (n=14)		condition after LCE, (n=36)		condition after LCE (n=21)		condition after LCE, (n=58)			
abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	
PCES caused by changes uncorrected during CE	1	7.1	1	2.8	1	4.8*	1	1.7	1	0.8
	1	7.1	1	2.8	1	4.8*	1	1.7	2	1.5
PCES caused by changes resulting from surgical interventions	1	7.1	1	2.8	1	4.8*	1	1.7	1	0.8
	1	7.1	1	2.8	1	4.8*	1	1.7	2	1.5
Lesions of the organs of the hepatopancreatoduodenal zone associated with long-term cholecystitis and not eliminated by cholecystectomy	1	7.1	1	2.8	1	4.8*	1	1.7	1	0.8
	1	7.1	1	2.8	1	4.8*	1	1.7	2	1.5
Organic and functional diseases of the gallbladder	1	7.1	1	2.8	1	4.8*	1	1.7	1	0.8
	1	7.1	1	2.8	1	4.8*	1	1.7	2	1.5
Total PCES	5	35.7	7	19.4	3	14.3**	2	3.4	17	13.2
Number of patients with PCES	4	28.6	5	13.9	2	9.5	1	1.7	12	9.3
Criterion χ^2	Df=1; $\chi^2 = 4.692$; p=0.031									

Note: - patients with PES with destruction of the integrity of the biliary tract; - patients with an organic form of PCES without destroying the integrity of the biliary tract; - patients with functional PCES; - differences relative to the data of the control group are significant (* - P<0.05, ** - P<0.001).

One of the main indicators characterizing the effectiveness of surgical intervention in acute destructive cholecystitis is the presence of postcholecystectomy syndrome in patients. When studying the nature of the PCES, we were guided by the classification of A. A. Shalimov (1988) (Table 5.5).

In the main group of patients, there were no such formidable forms of PES as iatrogenic damage to the bile ducts and cicatricial strictures, deformation of the bile ducts with impaired bile outflow, when in the comparison group after LCE, one patient had intraoperative excision of hepaticocholedocha. After the conversion, this patient underwent external drainage of the stump of hepaticocholedocha and after 1.5 months, hepaticoduodenoanastomosis was applied. The patient is under observation every 6 months, the patient is undergoing conservative therapy for an attack of reflux cholangitis. In two patients from this group, after LCE and TCE, 3 and 5 months later they were admitted with signs of cholangitis and mechanical jaundice, the examination revealed cicatricial stricture and deformation of the bile ducts with impaired bile outflow. These patients also underwent reconstructive hepaticoejunoanastomosis operations on replaceable transhepatic drainage according to Seipol-Kurian.

In 3 patients of the comparison group after LCE and TCE, there was an organic form of PCES without destroying the integrity of the biliary tract, of which 2 PCES, due to changes uncorrected in LCE and TCE. He performed ERCPG with the removal of "forgotten" stones from the main bile ducts and papillosphincterotomy. One patient after TCE had a concretion in the residual stump of the gallbladder, he underwent repeated intervention with the removal of the concretion from the residual stump of the gallbladder.

In the main group of patients in the long-term postoperative period, there were also 2 patients with an organic form of PCES without destroying the integrity of the biliary tract, of which one patient after LCE had stenosing papillitis and another patient after MLCE had a concretion of the residual stump of the gallbladder. A patient with stenosing papillitis underwent a papillosphincterotomy, and a patient with calculous stump underwent repeated intervention with the removal of concretion from the residual stump of the gallbladder.

In 8 cases in the long-term postoperative period, functional PCES were noted, of which 5 patients from the comparison group and 3 patients from the main group. These patients, together with other specialists, underwent appropriate conservative therapy.

Thus, patients with the organic form of PCES were more in the comparison group (10%) than in the main group (2.6%). The sharp decrease in the number of patients with PCES with destruction and without destruction of the integrity of the biliary tract, which has been noted since 2019, we associate with the transition to a differentiated approach of surgical treatment of patients with acute destructive cholecystitis. The use of a new wound dilator tool developed by us during cholecystectomy from a mini-access improved the results of surgical treatment of patients with acute destructive cholecystitis in the early and long-term postoperative periods.

Thus, the developed program, the developed algorithm for choosing the tactics of surgical treatment of patients with acute destructive cholecystitis and the developed device for a mini-access cholecystectomy made it possible to improve the quality of care by reducing the frequency

of immediate postoperative complications from 13.4% (11 patients in the comparison group) to 1.7% (2 patients in the main group) (criterion $\chi^2 = 4.954$; Df=1; $p=0.027$) and PCES in the long-term postoperative period from 24.0% (12 patients in the comparison group) to 6.3% (in 5 patients in the main group) (criterion $\chi^2 = 4.692$; Df=1; $p=0.031$).

Since 2019, the quality of life of patients who underwent cholecystectomy for acute destructive cholecystitis has been evaluated according to the program developed by us (certificate of official registration of the computer program No. DGU 05633, Agency for Intellectual Property of the Republic of Uzbekistan "Program for determining the quality of life of patients who underwent cholecystectomy"), including objective and subjective signs, instrumental data on which can be evaluated physical, mental and social daily activities of patients who have undergone cholecystectomy (Table 5.6, Figure 5.1).

The quality of life of each patient was assessed by the presence of the scores from the questionnaire on objective and subjective signs in the postoperative period. Patients who scored from 81 to 100 points were rated as «excellent», from 61 to 80 points – «good», from 41 to 60 points – «satisfactory» and patients with scores below 40 were rated as «unsatisfactory».

Table 5.6.

**Subjective criteria for determining the quality of life of patients
undergoing cholecystectomy**

N_i	Questions	Answers to questions	Scores
1.	How do You assess your overall health?	Badly	0
		Satisfactory	3
		Well	7
		Great	10
2.	Are You satisfied with the cosmetic result of the operation?	Badly	0
		Satisfactory	3
		Well	7
		Great	10
3.	How do You assess the overall result of the operation?	Badly	0
		Satisfactory	3
		Well	7
		Great	10
4.	How do You rate your physical activity	Badly	0
		Satisfactory	3
		Well	7
		Great	10

ОПЕРАТИВ АРАЛАШУВ УТҚА ЗИАНДАН СЎНГ БЕМОРЛАРДА ХАЕТ СИТУАЦИЯНИ АНИКЛАШ УЧУН ДАСТУР

Рис 5.6

Саволлар

1. Умуман, ўз соғлигингизни қандай баҳолайсиз?
 - Аъло
 - Қониқарли
 - Яхши
 - Емон
2. Операция ўтгандан 1 йилдан сўнг ўз соғлигингизни қандай баҳолайсиз?
 - Аъло
 - Қониқарли
 - Яхши
 - Емон
3. Операциядан олдин бажариб юрган оддий кунлик иш фаолиятигиз билан қай даражада шуғулланыласиз?
 - Иш фаолиятим яшилди
 - Бир оз чекланган
 - Илгаригидек
 - Чекланган
5. Операциядан 1 йил ўтган рўзгордаги оғир жисмоний зўриқишларни қандай қабул қилаясыз?
 - Яхши
 - Емон
 - Илгаригидек
5. Операциядан 1 йил ўтган рўзгордаги енгил жисмоний зўриқишларни қандай қабул қилаясыз?
 - Яхши
 - Емон
 - Илгаригидек
6. Операциядан 1 йилдан сўнг қанча масофани босиб ўта олаясыз?
 - 1 км дан зиёт
 - 200 м
 - 500 м
 - 50 м
7. Қўп қаватли бинонинг нечанчи қаватигача чиқа олаясыз?
 - 5 қаватгача ва ундан зиёт
 - 2 қаватгача
 - 4 қаватгача
 - 1 қаватгача
 - 3 қаватгача
8. Охири бир ойда оғрик интенсивлиги қай даражада бўлди?
 - Умуман оғри? сезмадим
 - Қучли
 - Қучсиз
 - Жуда қучли
9. Жамият орасида фаолиятигизни қандай баҳолайсиз?
 - Фаоллашдим
 - Бир оз тортичман
 - Илгаригидек
 - Жамоага қўшила олмайман
10. Ўтказилган операциядан кейин 1 йил ўтган қайфиятигиз қандай?
 - Аъло
 - Илгаригидек
 - Яхши
 - Емонлашди

Баллар	89	Хаёт сифати аниқлаш	Аъло	Баҳолаш	Тоғалаш
					Чизиш

Дастур муаллифлик ҳуқуқи томонидан ҳимояланган ©

Figure 5.1. Program for determining the quality of life of patients who have undergone cholecystectomy

According to the developed program, the quality of life of patients who underwent cholecystectomy was assessed - 40 (31.0%) patients out of 129 who were observed in the postoperative period. Of these, 18 patients from the comparison group and 22 patients from the main group (Table 5.7).

Table 5.7.

Distribution of patients depending on the assessment of the quality of life in the postoperative period

Study groups	Evaluation							
	Great		Well		Satisfactory		Unsatisfactory	
	abs.	%	abs.	%	abs.	%	abs.	%
Группа сравнения (n=18)	4	22,2%	11	61,1%	1	5,5%	2	11,1%
Основная группа (n=22)	18	81,8%	3	13,6%	1	4,5%	0	0%
Критерий χ^2 между группами	Df=3; $\chi^2 = 43.087$; p<0,001							
Всего (n=40)	22	65,0%	14	35,0%	2	5,0%	2	5,0%

As can be seen from Table 5.8, the quality of life of patients in the main group improved in contrast to patients in the comparison group. Thus, excellent and good results in the main group amounted to 95.4% (in 21 out of 22 patients), while in the comparison group this indicator was 83.3% (in 15 out of 18 patients). In general, according to all the results in the aggregate, a reliable best value was obtained in the main group (between groups, the criterion $\chi^2 = 43.087$; Df=3; p<0.001).

Conclusion of the chapter

Improving the choice of surgical treatment tactics for patients with acute destructive cholecystitis, techniques for performing surgical intervention, reducing the trauma of surgical access and other innovations developed and implemented within the framework of this study could not but affect the immediate results of management of this category of patients. Thus, in comparison with 2017-2018, the frequency of postoperative complications decreased from 13.4 to 1.7%, i.e. by 8 times. Complications such as bile discharge began to occur much less frequently (5 times), there were no such formidable complications as biliary peritonitis and damage to the bile ducts.

The long-term results were analyzed in 129 (64.2%) of 201 operated patients for acute destructive cholecystitis. Patients with the organic form of PCES were more in the comparison group (10%) than in the main group (2.6%). The sharp decrease in the number of patients with PCES with destruction and without destruction of the integrity of the biliary tract, which has been noted since 2019, we associate with the transition to a differentiated approach of surgical treatment of patients with acute destructive cholecystitis. The use of a new wound dilator tool developed by us during cholecystectomy from a mini-access improved the results of surgical treatment of patients with acute destructive cholecystitis in the early and long-term postoperative periods.

Thus, the developed program, the developed algorithm for choosing the tactics of surgical treatment of patients with acute destructive cholecystitis and the developed device for a mini-access cholecystectomy

made it possible to improve the quality of care by reducing the frequency of immediate postoperative complications from 12.2% (10 patients in the comparison group) to 1.6% (2 patients in the main group) (criterion $\chi^2 = 4.954$; Df=1; $p=0.027$) and PCEs in the long-term postoperative period from 24.0% (12 patients in the comparison group) to 6.3% (in 5 patients in the main group) (criterion $\chi^2 = 4.692$; Df=1; $p=0.031$)

In order to assess the quality of life of patients, a program has been developed that includes objective and subjective signs, instrumental data on which it is possible to assess the physical, mental and social daily activities of patients who have undergone cholecystectomy.

According to the developed program, the quality of life of patients who underwent cholecystectomy was assessed - 40 (31.0%) patients out of 129 who were observed in the postoperative period. Thus, excellent and good results in the main group amounted to 95.4% (in 21 out of 22 patients), while in the comparison group this indicator was 83.3% (in 15 out of 18 patients). In general, according to all the results in the aggregate, a reliable best value was obtained in the main group (between groups, the criterion $\chi^2 = 43.087$; Df=3; $p<0.001$).

CONCLUSION

The analysis of the literature of the issues indicates the existing objective difficulties in the surgical treatment of AC, especially destructive forms. The technical ability and desire to effectively help the patient are limited by the fact that today indications and contraindications to urgent minimally invasive radical operations are insufficiently specifically and reasonably formulated, which are preferable due to low traumatism. With age, polymorbidity increases in patients, limiting active surgical actions.

Despite all the successes and achievements in the treatment of acute calculous cholecystitis, the question of choosing a variant of cholecystectomy for destructive forms of the disease remains open. All this was the reason for this study.

The work is based on the evaluation of the results of surgical treatment of patients with acute destructive cholecystitis treated in surgical departments 1-clinic of the Samarkand State Medical Institute (clinical base of the Departments of Surgical Diseases No. 1 and General Surgery of the Samarkand State Medical Institute) for the period from 2017 to 2021. Depending on the treatment tactics, patients are divided into two groups. The main group consisted of 119 patients who were on inpatient treatment from 2019 to 2021. The comparison group consisted of 82 patients who were on inpatient treatment from 2017 to 2018.

The study included all operated patients admitted to the hospital with clinical symptoms of acute destructive cholecystitis. We excluded patients with the phenomena of mechanical jaundice or cholangitis from our study, since these complications are accompanied by a higher level of mortality

and complications and may distort the data of our study. The study included 201 patients, including 44 men and 157 women aged 17 to 87 years.

The morphological form of acute destructive cholecystitis was identical in both study groups.

It should also be noted that the number of patients with an attack duration of more than 72 hours in the main group was higher (11.8%) than in the comparison group (8.5%).

Judging by the data obtained, in the diagnosis of perivesical abscess or local peritonitis, mini-access cholecystectomy was performed more often in the main group of patients, and in the comparison group with these complications, conventional cholecystectomy was performed more often (the differences were significant compared with the comparison group, at $p < 0.05$). It should be noted that in some patients, a combination of local peritonitis with perivesical abscess or infiltration was detected.

Hypertension of 2-3 degrees, ischemic heart disease, and obesity of 2-3 degrees were most common in patients of both groups (the differences were significant in comparison with the comparison group, at $p < 0.05$). More than a third of patients have 2 or more concomitant diseases. The number of patients without concomitant diseases ranged from 19.3 to 20.7%.

It should also be noted that during the study period, laparoscopic access was introduced in the hospital and began to be used significantly more often, including in the treatment of acute cholecystitis.

In 2017-2018, operations were performed from traditional access and laparoscopic method. In the period 2019-2021, laparoscopic cholecystectomy or mini-access cholecystectomy was performed for acute destructive cholecystitis.

Currently, in patients with acute cholecystitis, we try to perform surgery with laparoscopic access. If there are general contraindications to pneumoperitoneum or indications for access conversion appear, we use a mini-laparotomy access. Traditional open interventions are used when it is impossible to use minimally invasive approaches or with symptoms of widespread peritonitis.

Thus, a comparative analysis of the studied groups showed that patients in both groups were comparable in gender, age and duration of the attack before surgery. Patients with perivesical infiltrate and concomitant pathology contraindications to pneumoperitoneum were more often subjected to cholecystectomy from a minilaparotomy access. According to the frequency and types of concomitant diseases, patients of the main group are leading, although a comparative assessment of the risk of anesthesia (according to the ASA scale) did not reveal significant differences among patients of both groups. Based on the above, we can talk about the comparability of the compared groups of patients.

Instrumental preoperative examination was standard and included, in addition to general (general clinical blood and urine tests, biochemical blood analysis, ECG, chest X-ray, etc.), ultrasound examination of the abdominal cavity and pelvis, as well as endoscopic assessment of the upper gastrointestinal tract.

Preoperative examination of the patient is a very important moment in small-access surgery, and especially in minilaparotomy, since intraoperative manual examination of organs outside the operation area is impossible.

The diagnostic methods used were aimed at identifying, differential and topical characteristics of destructive changes in the gallbladder and bile ducts. All patients underwent a comprehensive examination, which

included, along with an assessment of the clinical course of the disease and generally accepted laboratory and instrumental examination methods (general blood, urine, biochemical blood analysis, endoscopic examination of the stomach and duodenum). Various special research methods were used. Non-invasive: ultrasound, computed tomography (CT), magnetic resonance imaging (MRI). Invasive: ICH, ERCPG, videolaparoscopy and relaparoscopy.

Patients with benign lesions of the bile ducts remain a diagnostic complex category of patients, which is associated with both a long history and complicated course of the disease, polymorphism of the clinical picture of the latter, the presence of scar-inflammatory changes in the hepatopancreatoduodenal zone in previously operated patients. Verification of all changes in the bile ducts should be carried out using a comprehensive instrumental examination of patients before and during surgery.

A comparative assessment of the level of stress syndrome during operations on the biliary tract showed that operations from the mini-laparotomy access can be classified as minimally invasive according to the degree of surgical aggression. However, with the duration of surgery, the level of stress hormones increases in parallel.

Therefore, the optimal method of surgical intervention in patients with inflammatory diseases of the biliary tract with severe concomitant diseases (diseases of the cardiovascular system and chronic lung diseases, etc), when laparoscopic cholecystectomy is contraindicated, is a mini-laparotomy access operation, which, according to our study, is less traumatic than the laparotomy method with an average duration of surgery.

In the surgery of acute destructive cholecystitis since 2019, we have begun to widely use the so-called "mini-stop", taking into account the

individual characteristics for each patient. When choosing cholecystectomy by laparoscopic method or from minilaparotomy access, we focused on the results of preoperative diagnosis. Clinical signs of the course of acute cholecystitis were combined with ultrasound data.

A program has been developed for scoring the factors influencing the choice of surgery in patients with acute destructive cholecystitis, which allowed choosing the optimal method of surgery taking into account the individual characteristics of the body and improved the results of treatment.

According to the developed score scale, we recommend laparoscopic cholecystectomy to patients who scored from 0 to 5 points, and to patients who scored above 5 points, we recommend cholecystectomy through minilaparotomy access.

In the main group of patients, MLCE was carried out in terms of more than 72 hours from the onset of the disease, and at the beginning of the operation, attempts were made to standard surgery methods, and when technical difficulties arose, they sought to perform non-standard methods of MLCE.

Of 81 patients with acute destructive cholecystitis, standard MLCE was performed in 43 (53.1%) patients; MLCE from the bottom – in 27 (33.3%) patients, of which 6 (22.2%) had gallbladder amputation and 8 (29.6%) had cholecystectomy performed by the Fedorov method due to dense infiltration in the neck of the gallbladder and the danger of damage to hepaticocholedoch; MLHE according to the Device – in 11 (13.6%) patients.

The proposed program for choosing methods of cholecystectomy in patients with acute destructive cholecystitis with a score assessment of the severity of the disease, taking into account the clinical signs of the disease,

ultrasound and diagnostic laparoscopy data, allowed to reduce the duration of the operation from 66.5 ± 4.9 to 42.1 ± 2.9 minutes.

Another important innovative solution aimed at increasing the angle of operational action with topical mini-access is to use the capabilities of the wound expander for a thorough revision of the hepatobiliary system, which allows you to inspect hard-to-reach places.

The proposed device is convenient, simple and low-traumatic in use. It is recommended for wide use in practical medicine to expand the area of surgery.

Improving the choice of surgical treatment tactics for patients with acute destructive cholecystitis, techniques for performing surgical intervention, reducing the trauma of surgical access and other innovations developed and implemented within the framework of this study could not but affect the immediate results of management of this category of patients. Thus, in comparison with 2017-2018, the frequency of postoperative complications decreased from 13.4 to 1.7%, i.e. by 8 times. Complications such as bile discharge began to occur much less frequently (5 times), there were no such formidable complications as biliary peritonitis and damage to the bile ducts.

The long-term results were analyzed in 129 (64.2%) of 201 operated patients for acute destructive cholecystitis. Patients with the organic form of PCES were more in the comparison group (10%) than in the main group (2.6%). The sharp decrease in the number of patients with PCES with destruction and without destruction of the integrity of the biliary tract, which has been noted since 2019, we associate with the transition to a differentiated approach of surgical treatment of patients with acute destructive cholecystitis. The use of a new wound dilator tool developed by us during cholecystectomy from a mini-access improved the

results of surgical treatment of patients with acute destructive cholecystitis in the early and long-term postoperative periods.

Thus, the developed program, the developed algorithm for choosing the tactics of surgical treatment of patients with acute destructive cholecystitis and the developed device for a mini-access cholecystectomy made it possible to improve the quality of care by reducing the frequency of immediate postoperative complications from 12.2% (10 patients in the comparison group) to 1.6% (2 patients in the main group) (criterion $\chi^2 = 4.954$; Df=1; p=0.027) and PCES in the long-term postoperative period from 24.0% (12 patients in the comparison group) to 6.3% (in 5 patients in the main group) (criterion $\chi^2 = 4.692$; Df=1; p=0.031).

In order to assess the quality of life of patients, a program has been developed that includes objective and subjective signs, instrumental data on which it is possible to assess the physical, mental and social daily activities of patients who have undergone cholecystectomy. According to the developed program, the quality of life of patients who underwent cholecystectomy was assessed - 40 (31.0%) patients out of 129 who were observed in the postoperative period. Thus, excellent and good results in the main group amounted to 95.4% (in 21 out of 22 patients), while in the comparison group this indicator was 83.3% (in 15 out of 18 patients) In general, according to all the results in the aggregate, a reliable best value was obtained in the main group (between groups, the criterion $\chi^2 = 43.087$; Df=3; p<0.001).

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LIST OF ABBREVIATIONS

GL – gallbladder

LCE – laparoscopic cholecystectomy

MLCE – cholecystectomy from minilaparotomy access

ADCC – acute destructive calculous cholecystitis

ICU – Intensive Care Unit

PCES – postcholecystectomy syndrome

ESR – erythrocyte sedimentation rate

TCE – traditional (open) cholecystectomy

Ultrasound – ultrasound examination

CE - cholecystectomy

ECG – electrocardiography

ASA – American Association of Anesthesiologists

(American Society of Anesthesiologists)

SF-36 – The Short Form-36

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