

**COMPARATIVE ANALYSIS OF VARIOUS SURGICAL INTERVENTIONS IN
GALLSTONE DISEASES**

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ANNOTATION: The authors analyzed the results of surgical treatment of 1929 patients with chronic calculous cholecystitis (CCC). In the course of the study, the indications and contraindications to various methods of cholecystectomy were clarified, as well as the advantages and disadvantages of each of them were identified. This has significantly improved the effectiveness and safety of surgical interventions. The results of the study demonstrate the possibility of a personalized choice of surgery method, taking into account the individual characteristics of the patient and the characteristics of the disease.

Keywords. chronic calculous cholecystitis, laparoscopic cholecystectomy, traditional cholecystectomy, endosurgery.

Relevance. In cholelithiasis (GI) surgery, operative access should provide a good overview and the possibility of revision of the hepatobiliary zone.[1;2;4;6;9]

Unnecessarily wide or small access can lead to life-threatening complications during and after surgery. The different views of scientists on the solution of this problem highlights the ambiguous attitude towards this problem. At the same time, in recent decades, LCE and CE from mini-access have become widespread in the treatment of chronic calculous cholecystitis, but there is still no single standard of treatment. The known methods of cholecystectomy from mini access to LC are limited in use, which is due to the complexity of the design of the instruments, which caused limited use, and are also accompanied by complications due to existing disagreements among surgeons in determining indications and contraindications.[3;5;7;8;10]

The purpose of the study. to clarify the indications, contraindications, and substantiate the advantages and disadvantages of each of the three methods – laparoscopic cholecystectomy, mini-access cholecystectomy, and “traditional” cholecystectomy.

Materials and methods. The present study covers 1929 patients with chronic calculous cholecystitis (CCC) who underwent surgery in the 3rd surgical department of the AndSMI Clinic in the period from 2016 to 2021.

Two groups of patients were formed as part of the study: the comparison group (776 people, 40.3%) and the main group (1153 people, 59.7%). Patients from the comparison group who underwent surgery between 2016 and 2018 were included in a retrospective analysis to identify trends in the treatment of chronic cholecystitis before the introduction of innovative techniques. Patients from the main group who underwent surgery between 2019 and 2021 using improved surgical approaches, including new techniques and optimized tactical solutions, were included in the prospective analysis. This allowed not only to evaluate the

effectiveness and safety of the implemented innovations, but also to conduct a thorough comparative analysis of the results with the control group. This approach ensured the objectivity and reliability of the data obtained, which allowed us to draw informed conclusions and recommendations for further development and improvement of practices.

In the comparison group, which included 776 patients, traditional cholecystectomy (TCE) was performed in 75 (9.6%) patients, laparoscopic cholecystectomy (LCE) in 536 (69.1%), and mini-access cholecystectomy in 165 (21.3%).

In the main group consisting of 1,153 patients, the was performed in 76 (6.6%) patients, the LCE in 715 (62.0%), and the CE from the mini—access in 165 (21.3%). Additionally, 362 patients (31.4%) underwent the procedure using modified minimally invasive access, which emphasizes the focus on innovation and improvement of techniques.

Young patients (18-44 years old) prevailed in both groups, amounting to 379 (48.8%) and 535 (46.4%), respectively. This indicates that young patients are the main users of surgical services, regardless of the type of surgery.

The average age of patients in the comparison group was 45-59 years (211.27.2%), while in the main group this indicator was slightly higher — 356 (30.9%). Patients over 60 years of age were 128 (16.5%) and 182 (15.8%), respectively.

It is especially important to note that the age group of 75 years and older included 58 (7.5%) and 80 (6.9%) patients in each group. This indicates that even among the elderly, there is a tendency to choose minimally invasive surgical methods.

Results and discussion. When determining indications for known surgical procedures, researchers do not distinguish between acute and chronic forms of calculous cholecystitis. In this regard, in the course of our work, we clarified the advantages, disadvantages and contraindications to TCE, LCE and CE from the mini-access for chronic calculous cholecystitis.

Advantages, disadvantages, and contraindications to surgical procedures. When determining indications for known surgical procedures, researchers do not distinguish between acute and chronic forms of GI. In this regard, in the course of our work, we clarified the advantages, disadvantages and contraindications to TCE, LCE and CE from the mini-access for chronic calculous cholecystitis.

Advantages of traditional CE. 1) Traditional CE is performed from upper-medial or oblique subcostal incisions according to Kocher and Fedorov, which provide wide access to the GB, extrahepatic bile duct, liver, pancreas and duodenum.

2) Currently, TCE is used for CCC complicated by peritonitis, with pronounced adhesions, intrahepatic location of the CCC, as well as large stones at the neck, partially wedged into the lumen of the common CCC.

Disadvantages of traditional CE.

1) significant injury to the structures of the anterior abdominal wall, moderate surgical trauma leading to the development of postoperative intestinal paresis; a significant number of early and late wound complications (iatrogenic complications – 14.7%, complications related to surgery – 14.7%, wound – 10.7%);

2) increased risk of Thromboembolic complications (TC - 6.6%, mortality – 1.3%) and adhesions; significant cosmetic defect; longer period of post-acute and postoperative rehabilitation (requires 4-6 weeks) (see Chapter 5).

Contraindications to "traditional" CE do not exist, although it is necessary to refrain in patients with high operational risk when the time factor limits the performance of traumatic surgery.

Advantages of endosurgical operations: instead of a wide incision of the abdominal wall (from 7 to 30 cm in length), three to five trocar punctures of 0.5 -1 cm are performed. As a result:

1) there is no severe pain in the postoperative period;

2) Provides excellent cosmetic;

3) after recovering from anesthesia, the patient can be activated on the same day (you can get out of bed and walk);

4) the duration of stay in the hospital after surgery is up to 3-4 days; 5) after 14-15 days after surgery, you can start regular work and household activities.;

5) purulent-septic complications, as well as postoperative hernias, are extremely rare;

6) Multiple optical magnification and mobility of instruments allows timely diagnosis and operation of combined surgical pathology on different floors of the abdominal cavity with minimal trauma to surrounding organs and tissues.

Disadvantages of the endosurgical technique.

1) Cost. Expensive equipment, short-lived instruments, disposable imported consumables, the need for special training, the uniqueness of the technique - all this leads to a relatively high cost of endosurgical operations.;

2) Anesthesia. To perform LCE, it is necessary to fill the abdominal cavity with gas at a pressure of 10-14 mmHg.;

3) Duration. Due to a certain loss in freedom of manipulation, the inability to use the hand directly, and for a number of other reasons, the LCE may take longer than from a mini-access.;

4) Two-dimensional image of the operating field. Comparative analysis showed that in the comparison group, the frequency of iatrogenic was noted in 14.2, up to 7.5%, which contributed to the choice of differentiated tactics in the main group (see chapter 5)

Contraindications to LCE include.

- 1) The risk of grade 3 and 4 anesthesia with an unstable course of concomitant diseases;
- 2) Grade 2-3 obesity, which does not allow the surgeon to confidently navigate the operating field;
- 3) Previously undergone major open surgeries on the organs of the upper floor of the abdominal cavity, as this dramatically increases the risk of damage to the abdominal organs with the introduction of trocars and reduces the likelihood of access to the LC due to organs soldered to the anterior abdominal wall and adhesions in the subhepatic space;
- 4) Uncorrectable blood clotting disorders;
- 5) The level of intra-abdominal pressure is more than 15 mmHg;
- 6) The third trimester of pregnancy;
- 7) In conditions of a sufficiently intense pneumoperitoneum;
- 8) concretions of the LC greater than 30 mm, fixed at its neck with localization at the entrance to the choledoch;
- 9) intrahepatic location of the liver with wrinkling and sclerosis;
- 10) biliobiliary or biliodigestive fistulas;
- 11) cancer of the gastrointestinal tract; pustular skin diseases of the abdominal wall;

CE from a modified mini-access is performed in patients with high anesthetic risk and concomitant diseases in which the use of laparoscopy is contraindicated. All this allows performing CE from a mini-access for: cardiovascular insufficiency; coronary heart disease; hypertension; history of myocardial infarction; heart defects; obstructive pulmonary diseases, including bronchial asthma.

Advantages of CE from mini-access.

- 1) the possibility of CES for any patient's physique; reduced injury - minimal damage to the anterior abdominal wall (muscles do not dissect, but move apart along the fibers, which does not cause severe pain after surgery and accelerates wound healing) as a result, the wound heals easily and quickly, without visible scarring; the postoperative course is not much different from CES;

- 2) Reducing the risk of postoperative complications; the ability to operate on patients who have previously had surgery on the anterior abdominal wall;
- 3) the surgeon observes his actions not on a video screen, but directly with his own eyes (this reduces the risk of damage to the surrounding organs);
- 4) minimal use of anesthesia;
- 5) there is no need to use narcotic analgesics; the technique can be used in the 2nd and 3rd trimester of pregnancy; the possibility of cosmetic skin sutures;
- 6) intestinal paresis does not occur. CE from the mini-access is indicated in the presence of contraindications to LCE.
- 7) When switching to LCE conversions, you first need to switch to mini-access. If there are difficulties with HE from a mini-access, then the incision should be expanded to the size of the traditional one, but not more than 10 cm and with the obligatory preservation of the integrity of the right rectus abdominis muscle.

Comparative analysis showed that in the main group, compared to the comparison group, the incidence of postoperative complications related to surgery decreased by 3.9% (from 4.2% to 0.3%), with a decrease in the number of relaparotomies by 2.4% (from 2.4% to 0) (see Chapter 5).

Disadvantages of CE from mini-access.

- 1) there may be difficulties when surgical interventions on extrahepatic bile ducts are necessary, especially in obese patients;
- 2) atrophic changes of the liver with a high location from the edge of the costal arch.

Contraindications to CE from the mini-access. 1) the presence of diffuse and common biliary peritonitis, all common conditions when there are contraindications to endotracheal anesthesia.

Thus, by making adjustments to the preoperative preparation program, developing and implementing an improved therapeutic and diagnostic algorithm and a modified mini-access CE method, as well as clarifying the advantages, disadvantages and contraindications to TE, LCE and mini-access CE in CCH, we were able to optimize surgical tactics for this disease. If there are contraindications to LCE, the method of choice was a modified CE method from a mini-access.

By making adjustments to the preoperative preparation program, developing and implementing an improved therapeutic and diagnostic algorithm and a modified mini-access CE method, as well as clarifying the advantages, disadvantages and contraindications to TE, LCE and mini-access CE in CCC, we were able to optimize surgical tactics for this disease.

If there are contraindications to laparoscopic cholecystectomy, the modified CE method from the mini-access is the method of choice.

The differentiated use of the cholecystitis method with the determination of indications and contraindications to surgical procedures for CCC makes it possible to optimize the CE method and choose the most optimal method with a complex of preoperative preparation, as well as to improve the results of operations: the frequency of iatrogenic lesions decreased by 12.1%, postoperative complications associated with surgery - by 5.7%, purulent-septic – by 3.65%, mortality by 6.5 times, the number of re-operations by 1.9%.

Conclusion. The specified indications, contraindications, and justification of the advantages and disadvantages of each cholecystectomy method can significantly improve the effectiveness and safety of surgical intervention. This approach provides a personalized choice of surgery method based on the individual characteristics of the patient and the characteristics of the disease. As a result, we achieve a more accurate and predictable outcome, reduce the risk of complications, and improve the quality of life for patients.

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