



The Role and Place of Mini-Approach Cholecystectomy in Surgery for Chronic Calculous Cholecystitis

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ARTICLE INFO

Published Online:
24 December 2022

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ABSTRACT

The authors note that cholelithiasis, according to epidemiological indicators, occupies one of the leading places in the structure of the incidence of the abdominal organs. At the same time, cholecystectomy (CE) from the mini-access is not considered an alternative to laparoscopic cholecystectomy (LCE) and is an independent method. It is also noted that mini-access CE has a number of advantages and preferences compared to laparoscopic access.

Compared to LCE, the incidence of postoperative complications after CE from the mini-access is significantly lower and amounts to 1.9%–4.9%. The percentage of postoperative mortality is approximately the same and ranges from 0.8–1.2%, but it should be borne in mind that CE from the mini-access is most often performed in patients with complicated forms of cholelithiasis. Along with LCE, who routinely use CE from a mini-access, its use is undeservedly limited by many surgeons due to lack of experience.

KEYWORDS: cholelithiasis, cholecystectomy, laparoscopic cholecystectomy, CE from mini-access.

The working-age population ranges from 10 to 20% [6; 35]. In the United States, GSD is found in 15–20% of the population over the age of 40 years, and in 50% after 40 years [40].

The high prevalence of cholesterol gallstones, the observed increase in the number of adolescent patients, the identification of new links in etiopathogenesis, and the excessive healthcare costs for the treatment of patients with cholelithiasis determine the particular relevance of this problem [31; 37]. Within the framework of the foregoing, the incidence of cholelithiasis has a general medical, socio-economic significance [1].

Cholecystectomy (CE) for complications of cholelithiasis ranks first in terms of frequency among surgical interventions in emergency and elective surgery [13]. About 2.5 million operations on the biliary tract (mainly cholecystectomy) are performed annually in the world. Of these, in Russia – 110 thousand, in the USA – 700 thousand, in the UK – 45 thousand, in France – 70 thousand [7; 12].

Laparoscopic cholecystectomy (LCE) is considered to be the best option in the world for CE, but it is not done with comorbidities from the side of cardiovascular and pulmonary pathology. As a rule, in such patients, surgeons are forced to

remove the gallbladder (GB) according to the traditional method. And it is very difficult to tolerate because of the large incision on the abdomen. That is why surgeons in recent years more often began to use the “intermediate” version of the operation – the so-called CE from a mini-access. However, along with the widespread use of LCE, specific complications have appeared, the main of which is damage to the bile ducts (BD).

Thus, in the published data of meta-analyses, the frequency of damage to the BD averages 0.5–0.6%, which is five times higher than the rates for open CE (0.1–0.2%), which significantly affects on the quality and duration of life [9; 10; 14; 18; 36]. According to D.R. Flum et al. [32], damage to the bile ducts increases the risk of death in patients by 3 times. According to one estimate, the annual cost of litigation associated with damage to the GI exceeds \$1 billion in the US alone. It is estimated that in this country 1400–3700 patients per year will suffer bile duct injury during CE [38]. Also, in a quarter of cases of duct injury, vessels are also damaged. Most often – in 92% – the right hepatic artery is injured, which in 10% of cases leads to necrosis of the right lobe of the liver [16].

CE from a mini-access has been used since the 70s of the last century in order to minimize trauma to the abdominal wall. The gallbladder is removed from a 3–7 cm incision. CE from the mini-approach is indicated in cases where, due to a concomitant disease, the imposition of pneumoperitoneum and, therefore, laparoscopic CE is contraindicated [17; 25; 26].

In recent years, along with LCE, minilaparotomic cholecystectomy has been widely used in clinical practice. Minilaparotomic cholecystectomy has been described in several modifications by different authors [20; 26]. Priority in Russia belongs to I.D. Prudkov. et al. [20]. A feature of cholecystectomy from a mini-access is a small (up to 4 cm) laparotomic transrectal access using an original retractor with illumination and a set of necessary tools. According to many experts, CE from the mini-access is appropriate in cases where there are serious contraindications to the laparoscopic method. This method allows you to remove the gallbladder in conditions of a pronounced inflammatory periprocess and with a pronounced adhesive process in the area of the hepatoduodenal ligament, with non-standard anatomy, etc. Although, in recent years, the above contraindications are conditional.

Some experts believe that CE from a mini-access is preferable in cases where it is undesirable to create a tense pneumoperitoneum if the patient has severe diseases of the cardiovascular and respiratory systems [3; 23].

CE from a mini-access using the Mini-Assistant tool kit, which in turn significantly expanded the range of surgical interventions performed not only on the gallbladder in complicated forms of cholelithiasis, but also on the extrahepatic biliary tract and major duodenal papilla, improving immediate and long-term results surgical treatment of patients with cholelithiasis. The main idea of mini-approach CE is to combine the advantages of the traditional visual method and laparoscopic intervention, minimizing intraoperative trauma and postoperative complications [8; 22].

The technology has several advantages over existing methods, the most important of which are the possibility of visual inspection, digital revision of the gallbladder and elements of the hepatoduodenal ligament, performing the operation not only from the neck, but also from the bottom, as well as maintaining the volume and natural color of the tissues. In addition, the preservation of the tactile sensations of the fingers of the operating surgeon is of no small importance [22; 34].

Aliev D.G. et al. [2] when performing CE from mini-approaches, special retractor retractors are used with the installation of 4–6 mirrors with variable geometry. The size of the access is 5.5 cm. On average \pm 4.5 cm. The duration of the operation is from 40 to 210 minutes, on average 63.8 \pm 2.2 minutes (from the mini-access). The duration of the operation with traditional CE is 40–150 minutes (average 74

\pm 5.7 minutes). The authors conclude that the main advantages of CE from the mini-approach, in addition to minimally invasiveness, are the use of standard surgical techniques, the possibility of a full revision of the bile ducts and performing CE from the bottom, as well as suturing the gallbladder bed. Difficulties arise with obstructive calculous cholecystitis. The obtained data testify to the high efficiency of CE from the mini-access in GSD. CE from a mini-access can be considered as a full-fledged minimally invasive method of surgical treatment of patients with cholelithiasis.

The undoubted advantages of CE from the mini-access are: the similarity of the technique and techniques of operating with open laparotomy and visual control over the stages of the operation, which reduces the risk of iatrogenic complications, allows the surgeon to easily overcome the psychological barrier and quickly switch to open laparotomy if technical difficulties arise. In addition, the cost of the mini-access operation is 2.5–3 times less than the laparoscopic one [2; 8; 15; 22].

Mini-access conversion is necessary in 1.5–12.0% of cases [20; 29; 30; 33]. The reasons for the access conversion are pronounced cicatricial adhesions in the gallbladder and hepatoduodenal ligament, gallbladder empyema, perivesical inflammatory infiltrate, choledocholithiasis, choledochoduodenal fistula, as well as serious intraoperative complications (bleeding from the cystic artery, extensive trauma to the extrahepatic bile ducts). Gallbladder empyema, choledochoduodenal fistula, and choledocholithiasis are not always indications for access conversion. So, Shalimov A.A. et al. [28] successfully performed MCE in 167 patients with acute destructive cholecystitis, which accounted for 18.2% of the total number of operations for cholelithiasis. Duman G.V. and Ekkelman M.V. [11] successfully used a mini-access for the imposition of biliodigestive anastomoses in patients with obstructive jaundice. Prudkov M.I. and Titov K.V. [19] used a minilaparotomy approach when performing biliary operations in patients with cicatricial strictures of the bile ducts. Shulutko A.M. et al. [29] performed 112 mini-approach operations for choledocholithiasis not corrected by endoscopic method, while in 45.5% of cases, choledocholithotomy with choledochoduodenoanastomosis was performed. With the help of the “Mini-Assistant” apparatus, some authors perform reconstructive operations on the extrahepatic biliary tract for cicatricial strictures of hepaticocholedochus in the form of hepatico- and choledochojejunoanastomosis on an isolated loop according to Roux with frame drainage and biliobiliary anastomosis with a replaceable transhepatic drainage according to Pradery Smith. The main contraindication to hardware cholecystectomy is the presence of widespread biliary peritonitis as a complication of acute destructive cholecystitis [5; 21]. Compared with laparoscopic cholecystectomy, the incidence of postoperative complications after mini-access cholecystectomy is significantly lower and is 1.9% – 4.9%.

The percentage of postoperative mortality is approximately the same and ranges from 0.8 – 1.2%, but it should be borne in mind that mini-accessible cholecystectomy is most often performed in patients with complicated forms of acute cholelithiasis, obstructive jaundice and purulent cholangitis. At the same time, the main part of patients are elderly and senile people with the presence of concomitant diseases [15].

Assessing the financial and economic aspects, we can conclude that with the introduction of minilaparotomy technology, the administration of medical institutions is able to reduce the cost of treatment, for example, with cholelithiasis and its complications by 2 times, compared with laparotomy, and by 4–5 times compared with laparoscopic. The turnover of the bed increases, the cost of medicines and dressings decreases. Compared with laparoscopic methods of surgery, funding for the purchase of equipment and the implementation of the mini-access technique is 5–10 times less [22; 24; 39].

Comparison of three groups of patients who underwent CE revealed significant differences in the degree of surgical trauma with different types of access [22; 27]. LCE was accompanied by the least trauma and was characterized by the mildest and shortest postoperative period. Analysis of the results of MLCE showed an intermediate position of these interventions in terms of traumaticity criteria – this method of CE is much less traumatic than TCE, but inferior in a number of parameters (the amount of blood loss and the duration of the operation) to laparoscopic intervention. However, the negative impact of tense carboxyperitoneum on the function of vital organs and systems of the body requires careful intraoperative monitoring and timely correction of anesthesia in LCE.

CE from the mini-access is not considered an alternative to LCE and is an independent method. CE from the mini-access compared to the laparoscopic approach has the following advantages: the absence of carboxyperitoneum and, as a result, intraoperative changes in respiratory and hemodynamic parameters; the possibility of direct visual and palpation control of the gallbladder, extrahepatic bile ducts, adjacent organs; minimizing the risk of adhesion formation; the possibility of performing cholecystectomy “from the bottom” and, if necessary, suturing the gallbladder bed; the possibility of operating on patients who have previously undergone operations on the abdominal organs; reducing the length of stay in the hospital; the muscles are not dissected, but moved apart along the fibers, which does not cause severe pain in the postoperative period; the wound heals easily and quickly and without a visible scar; the ability to effortlessly remove the macropreparation from the abdominal cavity; if conversion is needed, access can be quickly expanded to a typical transrectal one [19; 22; 29].

CE from mini-approaches is preferred for diseases of the cardiovascular system, coronary heart disease, hypertension of 2–3 degrees, a history of myocardial

infarction, heart defects, exacerbation of lung diseases, including bronchial asthma, in the presence of a pacemaker and in those who underwent heart surgery [19; 22; 25; 26].

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CONCLUSION

Thus, CE from the mini-access is not considered an alternative to LCE and is an independent method. Mini-access CE has a number of advantages and preferences over laparoscopic access. Compared to LCE, the incidence of postoperative complications after CE from the mini-access is significantly lower and amounts to 1.9% – 4.9%. The

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