

МЕДИЦИНА, ПЕДАГОГИКА И ТЕХНОЛОГИЯ: ТЕОРИЯ И ПРАКТИКА

Researchbib Impact factor: 13.14/2024

SJIF 2024 = 5.444

Том 3, Выпуск 11, Декабря

RATIONALE FOR THE ROLE OF LAPAROSCOPIC CHOLEDOCHOLITHOTOMY IN COMPLEX FORMS OF CHOLEDOCHOLITHIASIS

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Annotation: This article is dedicated to the role of laparoscopic choledocholithotomy in complex forms of choledocholithiasis.

Key words: cholecystectomy, fibrocholedochoscope, lithotripter, intraoperative cholangiography, antegrade papillosphincterotomy, hepatobiliary system

Since there are currently many options for interventions on the bile ducts both before, during and after surgery, the rational choice of techniques that allow for cholecystectomy and removal of stones from the liver duct system using minimally invasive methods is particularly relevant. The choice of surgical treatment for patients with choledocholithiasis depends on a number of factors. Three groups of factors can be distinguished.

The first group of factors: the patient's condition upon admission to the clinic - age, presence of severe concomitant diseases, severity of jaundice, degree of dilation of the common bile duct, size of stones in the liver ducts, presence of inflammatory changes in the pancreas, etc.

The second group of factors includes the technical equipment of the clinic, namely, in addition to a laparoscopic tower and a standard set of instruments, the availability of additional tools and devices such as a thin fibrocholedochoscope, a lithotripter, and a mobile X-ray fluoroscopic unit, which makes it possible to perform interventions on the bile ducts under X-ray guidance.

The third group of factors includes the technical capabilities of the surgical team, their experience in performing complex interventions on the common bile duct, as well as the experience and capabilities of the endoscopist–surgeon performing ERCP and endoscopic papillotomy. Without taking into account all of the above-mentioned factors, it is difficult to choose the optimal treatment strategy for patients with choledocholithiasis.

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According to multicenter studies conducted by the European Association of Endoscopic Surgeons, even in clinics with extensive experience in laparoscopic interventions on the bile ducts, the choice of treatment strategy for patients with choledocholithiasis should be individualized. In patients younger than 60 years without serious comorbidities, it is advisable to perform cholecystectomy and bile duct interventions during a single laparoscopic operation. In patients older than 60 years with concomitant diseases, such an approach is of limited suitability, since laparoscopic bile duct surgery is quite time-consuming (up to 3–4 hours), which may lead to life-threatening postoperative complications.

Most surgeons believe that if large calculi are detected in the hepatic bile ducts of elderly patients during surgery and their extraction is technically difficult, it is advisable to convert to an open procedure and promptly complete the operation. The choice of a particular method of intervention on the bile ducts largely depends on the surgeon's experience and technical capabilities.

A number of surgeons (J. Berthou, Petelin, A. L. DePaula, P. Rossi, A. Cuschieri, and others) with extensive experience in laparoscopic bile duct surgery report the feasibility of laparoscopic removal of bile duct stones during a single operation in almost all patients. Surgeons with less experience in bile duct interventions consider it more appropriate to perform surgery in two or even three stages.

The possible treatment strategies include the following:

- ERCP combined with endoscopic papillotomy and stone extraction prior to laparoscopic cholecystectomy;
- laparoscopic cholecystectomy with intraoperative cholangiography, and if stones that are technically difficult to remove are detected, conversion to open surgery, choledocholithotomy, and drainage of the bile ducts.
- laparoscopic cholecystectomy + intraoperative cholangiography + transcystic bile duct intervention, with stone removal using Dormia baskets or balloon catheters under fibrocholedochoscopic or fluoroscopic guidance;
- laparoscopic cholecystectomy + intraoperative cholangiography + laparoscopic choledochotomy, stone extraction, and external drainage of the bile ducts;
- laparoscopic cholecystectomy + intraoperative cholangiography, laparoscopic choledochotomy or transcystic bile duct intervention with internal duct drainage using stents;

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- laparoscopic cholecystectomy + intraoperative cholangiography, antegrade papillotomy (sphincterotomy);
- laparoscopic cholecystectomy + intraoperative cholangiography, retrograde papillotomy (sphincterotomy);
- laparoscopic cholecystectomy + intraoperative cholangiography, lavage of small stones from the common bile duct with pharmacological relaxation of the sphincter of the major duodenal papilla;
- ERCP combined with endoscopic papillotomy in the early postoperative period after laparoscopic cholecystectomy;
- endoscopic papillotomy combined with extracorporeal lithotripsy of common bile duct stones in the early postoperative period after laparoscopic cholecystectomy.

Since methods of bile duct interventions are continuously improving, new treatment options for patients with choledocholithiasis may emerge in the near future.

Below, we present an algorithm for surgical decision-making in selecting treatment strategies for patients with cholelithiasis, which is currently used in most clinics.

In patients without signs of choledocholithiasis, laparoscopic cholecystectomy is performed, along with careful intraoperative diagnosis of choledocholithiasis. In cases of a wide cystic duct, the presence of small gallstones, or dilation of the common bile duct, intraoperative cholangiography is indicated, or—if specialized equipment is available—*intraoperative ultrasonographic assessment of the hepatic ductal system.*

In patients with signs of choledocholithiasis, ERCP is performed, and if stones are detected in the bile ducts, endoscopic papillotomy with stone extraction is carried out. In the presence of stones larger than 1 cm in diameter, lithotripsy is performed; if stone extraction is not possible, bile duct intervention is planned using either an open or laparoscopic approach. Laparoscopic cholecystectomy is performed 24–48 hours after endoscopic papillotomy.

When bile duct stones are detected *intraoperatively* in patient groups in whom choledocholithiasis was not diagnosed preoperatively (according to international literature, this accounts for 8–10% of patients with cholelithiasis), laparoscopic bile duct intervention is performed. The least traumatic method is transcystic extraction of stones from the common bile duct. If this procedure cannot be performed (e.g., the cystic duct is not passable for a choledochoscope, a large stone in the common bile duct that cannot be removed via the cystic duct, or other reasons), laparoscopic

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choledochotomy is carried out, followed by stone extraction from the common bile duct and either external drainage using a T-tube or internal drainage using a stent.

In the presence of multiple small stones in the common bile duct and narrowing of the major duodenal papilla, antegrade papillotomy (sphincterotomy) may be performed during laparoscopic surgery.

If technical difficulties arise during laparoscopic bile duct interventions due to the patient's severe condition that does not allow prolongation of the operation, stones detected intraoperatively in the common bile duct may be removed 24–48 hours after laparoscopic cholecystectomy by means of endoscopic papillotomy and stone extraction. It should be emphasized that such a strategy is possible only if the diameter of the stones in the common bile duct does not exceed 10–15 mm. In the presence of large stones in the common bile duct, endoscopic intervention may be ineffective; therefore, conversion to open surgery and performance of standard choledocholithotomy is advisable.

Laparoscopic revision of the bile ducts makes it possible to accurately determine the cause of impaired bile outflow, which cannot always be achieved using noninvasive diagnostic methods. Schedule a consultation with the leading laparoscopic surgeons of our Center, who will help you permanently eliminate gallstones from the hepatobiliary system.

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