V.S. Petrov, A.V. Tobokhov, V.N. Nikolaev

Characteristics and Technical Aspects of Laparoscopic Cholecystectomy at Acute Cholecystitis

ABSTRACT

Results of the analysis of cases of surgical treatment of gallstone disease based on the National Medical Center of the Republic of Sakha (Yakutia) for 2008 - 2013 are presented. Due to inefficiency of conservative treatment during 12-24 hours the urgent laparoscopic cholecystectomy (LCE) was conducted. For patients with complicated forms of cholecystitis a two-stage treatment with LCE on the second stage was conducted. The study showed that the combination of acute cholecystitis disease with gepatoduodenopancreatic zone the urgent LCE can be successfully applied.

Keywords: acute cholecystitis, choledocholithiasis, laparoscopic cholecystectomy.

INTRODUCTION

Acute cholecystitis makes its adjustments and features in the technique of laparoscopic cholecystectomy and still remains one of the urgent problems of abdominal surgery [1]. Severe infiltration and increased bleeding tissues, inadequate visualization and poor differentiation of the structures that were observed during surgery in patients with acute cholecystitis, significantly increase the risk of surgical intervention and dictate the need for development of several techniques that contribute to the successful and safe implementation of laparoscopic surgery for acute cholecystitis.

MATERIALS AND METHODS

This paper presents the analysis results of 2778 surgical treatment cases of gallstone disease according to materials of the National Center of Medicine of the Republic of Sakha (Yakutia) in 2008 – 2013. The Average age of the patients was 49.2 years. Among patients, women made up the vast majority, forming 2303 (82,9 %), men 475 (17,1 %).

Indications for urgent laparoscopic cholecystectomy (LCE) mostly did not differ from indications for "open" emergency surgery: under absence of effect from conservative treatment within 12-24 hours, we resorted to urgent LCE, when over a 2 day-period had passed from the beginning of the attack [1]. It

should be noted that the conservative attempts to control an attack of acute cholecystitis was conducted only under absence of patients with diffuse peritonitis. The main reason-why factor that may tempt us to conduct or refuse performing urgent laparoscopic surgery, along with the inefficiency of conservative treatment, was duration of the disease from the beginning of the attack.

Basing on this indicator, as well as on a clinical picture of the disease, we judged on the extent of possible changes in pericholecystic tissues and the probability of executing the urgent LCE. In a number of cases of obstructed acute cholecystitis, the necessity occurred of a two-stage surgical approach: external or internal drainage of bile ducts with the following delayed LCE. To perform the first stage decompression of the gallbladder, we preferred the technique of percutaneous perhepatic micro cholecystostomy under ultrasound control (PPMC) as the most gentle and optimal way. The main advantages of PPMC before laparoscopic micro cholecystostomy were minimally invasive intervention, no need for imposing pneumoperitoneum and special training of the patient, the possibility of its implementation in terms of perivascular infiltrate. After puncture and drainage of the gallbladder antegrade cholecystocholangiography was performed. The study conducted under fluoroscopy, gave the opportunity firstly to get information about the location of a catheter in the gall bladder. The study of extrahepatic bile ducts was performed with the help of antegrade cholecystocholangiography. Under less informative antegrade radiographic contrast study ("blocked" cystic duct), under jaundice or anamnesis pointing to frequent acute pancreatitis episodes of jaundice, we performed endoscopic retrograde cholangiopancreatography. When determining the second stage timing of surgical interventions we primarily focused on data of the study's special methods. Results of the dynamic ultrasound and antegrade cholecystocholangiography allowed objectively assess the dynamics of the inflammatory process, the condition of the gallbladder and extrahepatic biliary tract, perivascular tissues, the functional state of the liver. In acute cholecystitis complicated by mechanical jaundice, we usually tried to do surgery in 3 weeks after normalization of the liver pigment metabolism.

RESEARCH AND DISCUSSION

At 123 (4.4%) patients with complicated forms of cholecystitis the two-stage treatment was used in the second phase of LCE. The age of patients ranged from 48 to 76 years, with patients of elderly and senile age accounting the vast majority - 91 (74,0%) persons. The most patients, 109 (88.6%) ones, had diseases of circulatory and respiratory systems. The combination of complicated acute cholecystitis and related therapeutic pathology in these patients was characterized by development of the mutual aggravation syndrome, which required the comprehensive corrective therapy before invasive surgery.

The combined study of the bile ducts has enabled to identify choledocholithiasis at 77 (2,8 %) patients, in one case combined with stenosis of large duodenal papilla. All 77 patients received endoscopic papillosphincterotomy (EPST) with correction of the extrahepatic bile ducts pathology. 19 patients got endoscopic lithoextraction along with EPST, the rest had spontaneous passage of stones after EPST.

LCE was performed in the period from 7 to 35 days after imposition of PPMS. The average length of preoperative hospitalization made up 23.5 ± 1.8 days.

Adhesive preprocess around the gallbladder was identified during surgery at the vast majority of patients with acute cholecystitis, and 45 (10,5 %) patients had the gallbladder in the infiltrate of various severity extent formed, as a rule, by greater omentum, stomach and duodenum. The selection of the gallbladder from adhesion and infiltration began with capture of the visible area of the gallbladder wall and cautious offset of pericholecystic tissues with soft clip or peanut. This was quite easily managed with loose infiltrate and "soft" adhesions. Under more dense growths we used electric anchor, electric scissors or electric dissector. While separating adhesions, infiltration and excretion of the gallbladder we evaluated the nature and extent of its changes, topographic-anatomic relationships, visualization and access to the bladder's neck, hepatoduodenal band, the gate of the liver. To that end, we changed position of the operating table (lifting the head end, rotation along the longitudinal axis to the left, extension of subhepatic operating roller), adjusted the location and type of used trocars, took the decision on necessity of entering an additional trocar.

Indications to introduction of the 5-th additional tool - endoscopic retractor Endo Retract - were inadequate excretion and visualization of the bladder neck, the liver entry, preventing the safe manipulation and dissection of tissues in this area. Most often this operating situation occurred under perpicholyctic infiltrate with markedly edematous and infiltrated tissues, under location of the Hartmann pocket below hepatoduodenal ligaments. In addition, the need to enter an additional tool occurs during surgery at obese patients with hypertrophic great seal, closing the surgical field. We chose place of entering the endoscopic retractor individually accounting the topographic-anatomical picture. Usually the endoscopic retractor was entered via an additional 10-mm trocar, which was installed in the left hypochondrium by 3-4 cm below the costal arch on midclavicular line.

When analyzing topographic-anatomical and technical aspects of preparation and identification of the cystic duct and artery in acute cholecystitis a number of regularities were established. In 75 % of cases, the cystic duct connects with the common hepatic one under acute angle of 45°, in 17-20% of cases it can pass parallel to the common hepatic duct and in 5-8 % cases it crosses the space in front of or behind the common bile duct, falling from the left side. Despite the fact that in none of 430 cases of

LCE in acute cholecystitis we have not met the true anomalies of the biliary tract, in general, adhesions in the form of infiltration in the field hepatoduodenal ligament created quite unusual topographic-anatomic relationship of the choledochus and the cystic duct. The most common mistake when selecting the cystic duct, which leads to damage of the common bile duct was medial and upper dorsal tension of Hartmann pocket, which contributed to its bias to the gate of the liver. This leads to the convergence of the gallbladder neck with the common hepatic duct, thereby causing a decrease in the angle of the cystic duct confluence. By using laparoscopic optics with a tilt angle of 0°, the common bile duct seemed to be a continuation of the gallbladder's one and located with it on the same plane. Accounting this mechanism of common bile duct injury, traction of Hartmann pocket of gall bladder was made in the lateral or lateral-ventral direction. This contributed to the increase of the angle between the cystic and common hepatic ducts, as well as location of the Calot triangle plane along axis camera view of the laparoscope.

First of all we tried to isolate and identify the cystic duct. After clipping and crossing the cystic duct the neck of the gallbladder became mobile that allows select the cystic artery at a sufficient period. In case of bleeding this technique allowed adequately visualize the area of artery passage and detect the source of bleeding and to conduct targeted hemostasis.

Considerable difficulties can arise at the stage of selecting the gallbladder from the bed of the liver. A layer of loose connective tissue between the gallbladder wall and liver tissue in result of inflammatory process underwent significant changes. Along with coarse fibrous degeneration infiltration was marked. Selection of the gallbladder should be done with careful coagulation of the bed, being careful to avoid damage of the right hepatic artery of the right hepatic duct, which passed in the immediate vicinity of the gallbladder bed. After separation of the gallbladder, a section of connective tissue should be left at the site of attachment of the bottom of the gallbladder to the liver. Holding this section by the clip inserted through a lateral trocar, we raised the liver up for examination of the gallbladder bed.

Thus, the study showed that combination of acute cholecystitis with hepatobiliopancreatic area diseases urgent LCE can be successfully applied. Its execution was the most worthwhile when the uncroped attack, in the absence of gross infiltrative scar pericholecystic changes and pathology of the biliary ductal system. Speaking about the security of running LCE, features and technical aspects of its implementation at patients with acute cholecystitis, it was necessary to consider that with development and introduction of endoscopic surgery only method of removing the gallbladder had changed, and the nature of cholecystectomy remained the same. In this regard, the main way to improve the LCE results,

the most careful adherence remained to principles of surgery on the gallbladder and bile ducts operating for over 100 years.

CONCLUSIONS:

1. The combination of acute cholecystitis with diseases of hepatobiliopancreatic area urgent LCE can be successfully applied. At that, it is the most appropriate to execute the surgery in the absence of gross infiltrative scar pericholecystic changes and pathology of the biliary ductal system;

2. With development and introduction of endoscopic surgery only method of removing the gallbladder has changed and the nature of the surgery, cholecystectomy, remained the same.

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Authors:

Valeriy Sergeyevich Petrov – Cand. of Med. Sciences, director of Republic Hospital N1 – National Center of Medicine, Yakutsk

Address: 677019, 4 Sergelyakhskoye Road, Yakutsk

Phone: 8 (4112)395000

Alexander Vasilyevich Tobokhov – Professor, Doctor of Medical Science, head of hospital surgery and radiology chair at the Medical Institute of the North-East Federal University named after M.K. Ammosov

Address to contact: 677010, 4 Sergelyakhskoye Chaussee, Yakutsk

Phone: 8 (4112)395644

e-mail: avtobohov@mail.ru

Vladimir Nikolayevich Nikolayev – Cand. of Med. Sciences, associate professor of the hospital surgery and radiology chair at the Medical Institute of the North-East Federal University named after M.K. Ammosov