Smachylo R.M.

TREATMENT OF PATIENTS WITH BILE LEAKS AFTER LAPAROSCOPIC CHOLECYSTECTOMY

Kharkiv National Medical University, Ukraine

Abstract. *The analysis of treatment of 216 patients with bile leaks after laparoscopic cholecystectomy is done. In 56 patients bile leakage ceased on the background of conservative therapy, 22 patients had intra-abdominal bile collections, which required draining operations, most of them were performed by miniinvasive approaches. Endoscopic papillotomy was performed in 73 patients, in 29 with removal of stones, endoscopic stenting of common bile duct – in 14 patients. 47 patients underwent reconstructive surgery for common bile duct injuries. Minimally invasive interventions take a leading place in the treatment of postoperative bile leaks, but open surgery have not lost their importance in a number of indications.*
Key words*: laparoscopic cholecystectomy, bile leak, common bile duct injury*

Bile leaks after laparoscopic cholecystectomy (LCE) is one of the most common postoperative complications [1]. Its clinical significance ranges from self-controlled bile leaks to life-threatening early (bile peritonitis, sepsis) and late (biliary strictures) conditions. The most often sources of bile leaks after LCE are: gallbladder bed, cystic stump and common bile duct injury (CBDI) [2]. Conditions that predispose to bile leaks include obstruction of distal common bile duct, obscure anatomy and all risk factors of CBDI. Preoperative diagnosis of patency of the distal common bile duct remains a pressing problem of biliary surgery. On average, 10% of patients with chronic cholecystitis, and 15% of patients with acute cholecystitis have choledocholithiasis. With the introduction of laparoscopic cholecystectomy (LCE), the patients are operated on earlier for gallstone disease (GSD), which reduced the incidence of choledocholithiasis in the western countries to 5%. Unfortunately, a thorough medical history, physical examination, biochemical blood tests (total

bilirubin, transaminases, amylase, lipase), ultrasonography (USG) of the abdominal cavity is not always possible to detect a violation of patency of the distal common bile duct before the cholecystectomy and avoid CBDI. In addition, a number of patients are operated in emergency procedures when there is no way to do all necessary tests.

Aim: To develop a program of treatment of patients with bile leaks after LCE.

Materials and Methods. Results of treatment of 216 patients treated in the Institute of General and Urgent Surgery of AMSU in 2005-2013 is presented. Most patients (112) were transferred after primary operations in other hospitals of the city of Kharkiv and Kharkiv region. These patients were admitted in a period from 3 days to 4 weeks from the initial surgery. The rest 104 patients underwent LCE in Institute. There were 168 females and 48 males. Age ranged from 21 to 84 years. Patients were examined by routine clinical and laboratory tests, ultrasound, CT, ERCP fistulography.

Results. The primary intervention in all patients was LCE with subhepatic drainage. Bile leak volume ranged from 100 ml to 1000 ml per day, the last corresponded to the total external biliary fistula. The phenomena of jaundice occurred in 15 patients accompanied with cholangitis in 8. 22 patients had intra-abdominal bile collections, in 12 with signs of diffuse bile peritonitis. Following a comprehensive clinical-laboratory and instrumental examinations aimed at assessing the general condition of the patient, the presence of intra-abdominal complications, the presence of the common bile duct obstruction, further tactics was determined.

The primary goal was the resolution of intraabdominal complications caused by bile leaks. Thus bilomas were drained under ultrasound guidance in 6 patients, relaparoscopy, drainage of the abdominal cavity was performed in 14, laparotomy, choledocholithotomy, common bile duct drainage, drainage of the abdominal cavity was performed in 2. 3 patients from this group required further interventions to control bile leak after external drainage.

The next goal was to determine the cause of bile leaks. Patients with low-grade bile leaks without local and general complications undergo conservative treatment,

which was effective in 56 cases (in these patients the cause of bile leaks remain obscure). The remaining patients together with 3 patients that were drained for intraabdominal bile collections underwent diagnostic tests (ERCP and/or fistulography). The sources of bile leak were: gallbladder bed – 11 patients, cystic stump – 22, CBDI – 73, in the rest cases the source was not identified. ERCP diagnosed residual choledocholithiasis in 35 patients, stenosis of the distal common bile duct due to chronic pancreatitis – in 18, stenosis of major duodenal papilla – in 20, CBDI without obstruction of common bile duct – in 61. In 7 patients ERCP was not possible due to technical reasons (Billroth-II gastrectomy, a large parapapillar diverticulum).

The main treatment for these patients was endoscopic. Endoscopic papillotomy was performed in 73 patients, common bile duct stone removal – in 29 patients. These interventions have proved effective in 98 (90.7%). Among the complications acute pancreatitis was observed in 14 patients, of whom two with severe pancreatitis, bleeding from papilla incision – in 2, which was controlled conservatively. There were no deaths. 7 patients in whom ERCP was not possible and another 10 patients who failed endoscopic treatment underwent laparotomy, drainage of common bile duct. 57 patients had CBDI without obstruction of distal portion of common bile duct. Endoscopic stenting was successful in 14 patients. The rest 47 patients underwent open interventions for CBDI: repair of CBDI on T-drain or transhepatic drain in 7 cases; Rough-en-Y hepaticojejunoanastomosis in 40 patients. There were two deaths. One patient with biliary peritonitis died due to multiple organ failure, other patient died due to cardiac failure on the second postoperative day after Rough-en-Y hepaticojejunoanastomosis.

Discussion. Bile leaks are rather frequent complication after gallbladder removal. Despite the fact that the manifestation of this condition is characterized by the bile discharge from the abdominal cavity, its causes and severity varies widely [1]. It may be self-controlled within 5-7 days bile leak, as well as life-threatening condition with the development of bile peritonitis or persistent external biliary fistula due to CBDI. All bile leaks are characterized by a particular source, which can be

both intrahepatic and extrahepatic biliary ducts, and therefore the problem is often discussed in the section of the LCE threatening complications like CBDI. The frequency of this complication in the literature varies widely, and about its treatment there are divergent points of view [2].

The first line tactical approach in patients with bile leaks after the LCE is the identification of possible intra-abdominal complications (biliary peritonitis, intraabdominal bile collections). For this purpose, thorough clinical assessment together with diagnostic investigations (ultrasound and CT) is used. In presence of the intra-abdominal bile collections minimally invasive techniques (drainage under ultrasound guidance and relaparoscopy) were used. We prefer to perform relaparoscopy in early period after LCE (14 cases) and percutaneous drainage under US-guidance in more late terms (6 cases). Only in cases of diffuse bile peritonitis we perform laparotomy, external biliary drainage, drainage of the abdominal cavity (2 patients). In the absence of intra-abdominal complications conservative tactic is used initially. In other cases, measures, aimed to identify both the source and cause of bile leak, are performed.

Carefully analyzing the clinical cases of bile leaks we noted the following anatomical, technical and clinical predictors of this complication. Leak from cystic duct stump develops usually for two reasons or their combination: on the one hand, it is difficult cystic duct stump closure (wide cystic duct, the presence of a small stones, severe inflammatory changes in the cystic duct), on the other hand the presence of bile hypertension in biliary tree (choledocholithiasis, constrictive papillitis, stenosis of the distal portion of common bile duct, acute pancreatitis).

Injury of the bile ducts in the gallbladder bed occurred in the traumatic separation of the gallbladder wall from the liver (especially in sclerosed gallbladder, when the wall of the gallbladder is intimately fixed to the liver parenchyma), or in the presence of aberrant duct in gallbladder bed.

The most dangerous cause of bile leak is CBDI. Its causes are listed in detail in numerous papers and most accurately are described by the triad: dangerous anatomy, dangerous pathology and dangerous surgery. In these patients, the elective tactics is

used depending on the type and level of injury, presence of jaundice or intra-abdominal complications. Minimally invasive approaches (endoscopic stenting) if possible is first line approach during the last decade [3, 4]. However, open surgical procedures do not loss their significance. They are considered in the following situations: 1) the inability to perform ERCP (gastrectomy after Billroth-II, contraindications), 2) the ineffectiveness of endoscopic interventions, and 3) major CBDI. It is very important to determine the optimal time to perform repeated surgery. In the presence of common bile duct drainage definite surgery can be postponed until a month later, which favors remitting inflammatory changes in the area of intervention and recovery of the patient.

Conclusions. The current trends of treatment of bile leaks after LCE are focused on the use of minimally invasive techniques. This is primarily endoscopic papillotomy, endoscopic stone removal if present and stenting. In addition, minimally invasive draining interventions (under ultrasound control, laparoscopic) should be used for intraabdominal bile collections. Open procedures are indicated for diffuse biliary peritonitis, major CBDI when ERCP is not possible or contraindicated.

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Резюме. У роботі проведений аналіз лікування 216 пацієнтів з жовчевитіканням після лапароскопічної холецистектомії. У 56 хворих витікання жовчі припинилось на тлі проведення консервативної терапії, 22 пацієнти мали інтраабдомінальні скупчення жовчі, що вимагало дренуючих операцій, більшість з яких виконано мініінвазивно. Ендоскопічна папілосфінктеротомія виконана 73 пацієнтам, у 29 з видаленням конкрементів, ендоскопічне стентування гепатикохоледоху – у 14. 47 пацієнтам проведені відновні і реконструктивні операції з приводу пошкоджень жовчних протоків. Малоінвазивні втручання мають провідне значення у лікуванні післяопераційних жовчевитікань, однак відкриті операції не втратили свого значення при низці показань.
Ключові слова: лапароскопічна холецистектомія, жовчевитікання, пошкодження жовчних протоків

Резюме. В работе проведен анализ лечения 216 пациентов с желчеистечениями после лапароскопической холецистэктомии. У 56 больных истечение желчи прекратилось на фоне проведения консервативной терапии, у 22 пациентов отмечены интраабдоминальные скопления желчи, что требовало дренирующих операций, большинство из которых выполнено миниинвазивно. Эндоскопическая папиллосфинктеротомия выполнена 73 пациентам, у 29 с удалением конкрементов, эндоскопическое стентирование гепатикохоледоха - у 14. 47 пациентам проведены восстановительные и реконструктивные операции по поводу повреждений желчных протоков. Малоинвазивные вмешательства имеют ведущее значение в лечении послеоперационных желчеистечений, однако открытые операции не утратили своего значения при ряде показаний.
Ключевые слова: лапароскопическая холецистэктомия, желчеистечение, повреждение желчных протоков

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