

was sutured to the mucosa of the "neo-vestibulum" along the lower edge of the vestibule-rectal defect. The proximal bowel segment was pulled through the retrorectal tunnel in order to create a low coloanal anastomosis, applying single sutures transanally.

### Results

There were no intraoperative complications requiring conversion to laparotomy. Patients start oral intake and walking the day after surgery. The operating time was about 180 min. Postoperative complications (bleeding), which had required additional surgery, occurred in 1 (2.7%) patients. No bowel anastomosis leakage was found. There were 4 (10.8%) patients who experienced a minor stricture of the vaginal introitus (treated successfully using dilation).

The mean postoperative hospital stay was 4.2 days. The mean follow-up period was 97 months (range 5–187 months). A gynecological examination showed good morphology of the artificial vagina, created both with a sigmoid colon autograft (35 cases) and with a rectal stump (2 cases). 33 (89.2%) patients reported a satisfying sexual life, and 21 (56.8%) of them got married.

### Conclusion

The sigmoid colon autograft method of vagina reconstruction produces results which are very close to the natural anatomy and vaginal function. For the patients with a vestibule-rectal fistula, we devised a laparoscopic technique of colpopoiesis using a rectal stump autograft. The laparoscopic technique of colpopoiesis is feasible, safe, and seems to

be the treatment of choice for the congenital vaginal agenesis.

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M. E. Nichitaylo, A. V. Skums, V. P. Shkarban, A. I. Litvin, A. A. Skums

## COMBINED INJURIES OF BILIARY DUCT AND BRANCHES OF A HEPATIC ARTERY FOLLOWING CHOLECYSTECTOMY

A. A. Shalimov National Institute of Surgery and Transplantology NAMS of Ukraine, Kiev, Ukraine

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М. Е. Ничитайло, А. В. Скумс, В. П. Шкарбан, А. И. Литвин, А. А. Скумс  
СОЧЕТАННЫЕ ПОВРЕЖДЕНИЯ ЖЕЛЧНЫХ ПРОТОКОВ И ВЕТВЕЙ ПЕЧЕНОЧНОЙ  
АРТЕРИИ ПРИ ХОЛЕЦИСТЭКТОМИИ

Национальный институт хирургии и трансплантологии имени А. А. Шалимова  
НАМН Украины, Киев, Украина

В работе изучены результаты лечения 29 больных с сочетанными повреждениями желчных протоков и ветвей печеночной артерии при холецистэктомии за период с января 1984 г. по июнь 2012 г. У 2 (6,9 %) пациентов предприняты попытки восстановления артериального кровотока с последующим реконструктивным вмешательством на желчных протоках. У 19 (65,5 %) больных в условиях адекватного коллатерального кровоснабжения печени сформирован гепатико-еюноанастомоз. В одном случае предварительно проведена эндоваскулярная эмболизация аневризмы печеночной артерии, осложненной гемобилией. Различные по объему резекции печени выполнены у 8 (27,6 %) больных. Послеоперационная летальность — 3,5 %. Положительные результаты получены в 86,2 % наблюдений. У больных с сочетанными повреждениями желчных протоков и ветвей печеночной артерии при холецистэктомии необходимо применение мультимодальной тактики лечения с учетом особенностей их клинического течения.

**Ключевые слова:** сочетанное повреждение желчного протока и ветвей печеночной артерии, холецистэктомия.

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M. E. Nichitaylo, A. V. Skums, V. P. Shkarban, A. I. Litvin, A. A. Skums  
COMBINED INJURIES OF BILIARY DUCT AND BRANCHES OF A HEPATIC ARTERY  
FOLLOWING CHOLECYSTECTOMY

A. A. Shalimov National Institute of Surgery and Transplantology NAMS of Ukraine, Kiev, Ukraine  
There were studied the results of treatment of 29 patients with combined injury of biliary ducts and hepatic branches at cholecystectomy during the period from January 1984 to June 2012. Attempts of arterial blood supply restoration with the subsequent reconstructive intervention on biliary ducts were



performed in 2 (6.9%) patients. Hepaticojejunostomy was formed in 19 (65.5%) patients under conditions of adequate collateral blood supply of the liver. Endovascular embolization of aneurism of the hepatic artery complicated by hemobilia was performed in one case. Resections of the liver different in volume were executed in 8 (27.6%) patients. A postoperative lethality was 3.5%. Positive results were received in 86.2%. The patients with combined damages of biliary ducts and hepatic branches at cholecystectomy needed multimodal management.

**Key words:** combined biliary and hepatic artery injury, cholecystectomy.

Bile duct injury is a severe and life-threatening complication of cholecystectomy, the frequency of which has increased to 0.5–1.4% with the introduction of laparoscopic methods into clinical practice [1]. Combined injuries of extrahepatic bile ducts and blood vessels are considered to be the main cause of the high frequency of poor treatment outcome and mortality [5; 6]. According to clinical studies combined injuries took place in 13.8–26% of all cases of bile duct injuries during cholecystectomy [6; 7], and in a series of patients undergoing routine diagnostic arteriography the number increases to 47% [1]. Predicting the result of hepatic branches occlusion is difficult: the effects may be absent, due to the presence of arterial collaterals, but, the development of ischemic necrosis of the liver, intrahepatic abscesses, pseudoaneurysm formation of the branches of the hepatic artery and its rupture, hemobilia, or intraperitoneal bleeding are possible [10; 13]. The problem is not studied enough because of poor experience of different clinics. The purpose of this study was to justify a differentiated surgical treatment depending on the clinical course of bile duct injuries and injuries of branches of the hepatic artery during the cholecystectomy.

### Material and Methods

In this paper we studied the results of treatment of 29 patients with combined injuries of the bile ducts and branches of the common hepatic artery during cholecystectomy within the period from January 1984 to June 2012. Among them, 24 (82.8%) women and 5 (17.2%) men. The patients' age was 26–73 years. All of them were direct-

ed to the clinic on different terms after cholecystectomy from regions of Ukraine. Patients have been operated on 1–3 times (excluding cholecystectomy) to eliminate complications arising from the duct injury, such as obstructive jaundice, biliary peritonitis, intra-abdominal abscesses.

Preoperative examination, together with common clinical and laboratory methods, including ultrasound of the abdominal cavity, the methods of direct biliary opacification (endoscopic retrograde, percutaneous transhepatic or fistulocholangiography), Doppler ultrasonography, angiography, helical computed tomography. Type of injury was determined according to the developed in the clinic classification, based on H. Bismuth's system. Long-term results were assessed using a scale of J. Terblanche et al. (1990). Statistical analysis was performed using a parametric analysis of variance for repeated measurements on one quantity category.

### Results

In the first group of patients, in 20 (69.0%) patients the injury was observed during the open cholecystectomy and in 9 (31.0%) — during laparoscopic one. Intraoperatively bile duct injury was detected in 6 (20.7%) cases. Depending on the level of bile duct injury, patients were divided into the following types of injury: I type by H. Bismuth — 1 (3.5%), II type — 7 (24.1%), III type — 15 (51.7%), IV type — 6 (20.7%).

Only in one case the injury of the common hepatic artery was suspected during the operation, but it has not been examined intraoperatively. In the early postoperative period (up to 7 days) the occlusion of branches of the

proper hepatic artery was diagnosed in 4 patients (13.8%), in late postoperative period (8–432 days) — in 25 (86.2%) patients. The occlusion of the proper hepatic artery was revealed in 5 (17.2%) cases, 22 (75.9%) — the right hepatic artery and 2 (6.9%) — the left hepatic artery.

The mechanism of injury was discovered only in 11 cases: ligation or suturing arteries in sudden bleeding — in 6 patients, clipping — in 3, crushing grip — in 2. Damage to blood vessels was found during angiography (15 patients) and spiral CT (14 patients).

The clinical course of combined injuries of the extrahepatic bile ducts and branches of the common hepatic artery was characterized by symptoms which are typical for bile duct injury, and complications caused by ischemia of the liver (Table 1).

*Table 1*  
**Type and Frequency of Complications in Patients with Combined Injury of Bile Ducts and Hepatic Arteries**

Complication	Number of patients, abs. (%)
Obstructive jaundice	6 (23.1)
Biliary peritonitis	3 (11.5)
Suppurative cholangitis	7 (26.9)
External biliary fistula	4 (15.4)
Liver abscess	15 (57.7)
Hepatic artery pseudoaneurysm, hemobilia	1 (3.4)
Necrosis of liver lobe	1 (3.8)
Failure of biliodigestive anastomosis	3 (11.5)
Early stricture	3 (11.5)
Acute liver failure	7 (26.9)
Biliary sepsis	7 (26.9)
Atrophy of the liver	5 (19.2)



Surgical approach and extent of operation depended significantly on lesions detection time. With the cases of early diagnosis in terms of 3–4 days after cholecystectomy attempts to restore the blood flow were taken in 2 patients: in one case the clip was removed from the right hepatic artery, in the other case — resection of the thrombosed area of proper hepatic artery and the end-to-end anastomosis. At the same time the correction of bile outflow was not performed, only the drainage of bile ducts was performed. In both cases on the 3rd and 4th months the high hepaticojunostomy formed, one of them — after endovascular stenting of the common hepatic artery due to stenosis of anastomosis. Two patients with combined injuries due to the bile peritonitis were not taken attempts to restore blood flow. Surgical intervention consisted of external drainage of bile ducts. The final correction of outflow was made in 2–3 months.

Concomitant injury of the arteries was diagnosed in 25 patients at the late postoperative period. Surgical approach was determined according to the developed collateral arterial blood supply to the liver and the presence of necrotic changes.

Development of adequate collateral arterial blood supply to the liver was noted in 9 patients with complete external bile fistula. In the case of hepatic artery aneurysm and hemobilia the endovascular embolization of hepatic artery aneurysm was performed at the first stage. In terms of 3–4 months they were performed reconstructive operations to restore outflow, in one case using a transhepatic drainage of Goetz–Saypol–Kurian.

Infarcts of the liver with the formation of single or multiple liver abscesses developed in 16 patients with combined injuries of the bile ducts and blood vessels in the postoperative period. The first stage of sepsis and liver failure treatment included the usage of antibiotic therapy, taking into

account the sensitivity of microflora, decompressing the bile ducts (mostly using minimally invasive techniques), percutaneous biliary drainage of abscesses and bile streaks, enteral and parenteral nutrition. Sepsis and liver abscesses were removed in 8 patients. In the future outflow was restored by the formation of biliary-enteric anastomosis. Despite the use of complex treatment liver abscesses could not be eliminated in 8 patients, and therefore the resection of different types was performed (Table 2).

Postoperative mortality was 3.5% (1 patient). Long-term results were followed within a period from 6 months to 10 years. Positive results were achieved in 25 (86.2%) patients. Unsatisfactory results were observed in 3 (10.3%) patients: cirrhosis of the liver developed in one patient 8 years after hepaticojunostomy with transhepatic drainage, 2 patients suffered from atrophy of the right lobe of the liver.

### Discussion

The clinical significance of associated vascular injuries with

the extrahepatic bile duct injuries during cholecystectomy is underestimated: their course is more severe, many patients die [9]. According to the analysis of J. F. Buell et al. it was found that the presence of associated injury of the hepatic artery is a harbinger of significantly higher mortality (38% vs. 3% without it,  $P < 0.001$ ) [3].

There is no doubt that the presence of combined injury of bile ducts the branches of the hepatic artery significantly affects the clinical course and, accordingly, on the surgical treatment strategy. However, several issues remain controversial. There is no single point of view on whether to restore arterial blood flow of the liver or not showed that simultaneous revascularization of the liver and restore outflow yields positive results in 81.8% of observations [11]. In contrast, almost 50% of patients, in which only biliodigestive fistula was formed, had primary failure of the hepaticojunostomy or stenosis of ischemic origin [8; 13]. Biliary complications were observed in 19% of pa-

Table 2

### Surgical Management of Combined Bile Duct and Vessels Injury

Management	Number of patients
Vessels anastomosis+endovascular stent, hepaticojunostomy	1
Removal of clip from right hepatic artery, hepaticojunostomy	1
Necrectomy of left liver	1
Left lobectomy	2
Left hemihepatectomy	1
Right hemihepatectomy	4
Transcutaneous drainage of hepar abscess, hepaticojunostomy	5
Hepaticojunostomy, transcutaneous drainage of hepar abscess	2
Endovascular embolization of hepatic artery aneurysm, hepaticojunostomy	1
Hepaticojunostomy	10
Hepaticojunostomy with transhepatic drainage	1
Total	29



tients, 6% of them led to death; in future 16,6% of patients developed strictures of the bile ducts and 9.26% — cirrhosis of the liver [12].

Due to late diagnosis and peritonitis development the restoration of arterial blood flow of the liver becomes technically impossible. J. Li et al. believe that the reconstruction of the right hepatic artery is possible only with the early (up to 4 days) diagnosis [9]. Revascularization, performed on the background of arising necrosis of the liver, is ineffective [4].

According to A. Alves et al. bile duct injury combined with the injury of the right hepatic artery does not affect the result of reconstruction by the Hepp-Couinaud method, because arterial plexus in the area of the portal plate provides adequate blood flow to the contralateral lobe of the liver [1]. O. Bilge et al. obtained almost the same number of positive long-term results (100 and 96%) in patients with isolated and combined injuries of the bile ducts with a significantly higher rate of complications in the second group [2].

However, the combined injury occurs not only with complications associated with bile duct injury, but symptoms caused by liver ischemia or hemorrhage [10; 13]. According to analysis of the database PubMed in patients with combined injury of the bile duct (type E4 or E5 by the Strasberg classification) and arteries, risk of liver resection is 43.3 times higher than in patients with isolated duct injury [14]. In 8 patients (27.6%) of the analysed group liver resection was performed in different terms.

Thus, patients with combined injuries of the bile ducts and branches of the hepatic artery during cholecystectomy should use a multimodal treatment strategy, taking into account the time of diagnosis and clinical course. In cases with the early diagnosis — the restoration of blood flow is necessary. With the de-

velopment of adequate collateral blood supply optimal volume of surgical intervention is high hepaticojunostomy. With the development of necrotic changes of the liver, the first stage should be a complex treatment of sepsis and drainage of abscesses of the liver and biliary decompression, mainly using minimally invasive techniques. In case of failure of treatment of multiple liver abscesses, the resection should be performed.

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V. I. Pyrohova, I. V. Vernikovskyy, N. S. Veresnyuk, Kh. V. Kozak

## USING OF HYSTEROSCOPY IN THE DETERMINATION OF STATE OF THE ENDOMETRIUM IN PATIENTS SUFFERING FROM HYPERPROLACTINAEMIA

The Lviv National Medical University named after Danylo Halytskyi, Lviv, Ukraine,  
Lviv Regional Clinical Perinatal Center, Lviv, Ukraine

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В. И. Пирогова, И. В. Верниковский, Н. С. Вереснюк, Х. В. Козак  
ИСПОЛЬЗОВАНИЕ ГИСТЕРОСКОПИИ В ОЦЕНКЕ СОСТОЯНИЯ ЭНДОМЕТРИЯ У БОЛЬНЫХ  
С ГИПЕРПРОЛАКТИНЕМИЕЙ

Львовский национальный медицинский университет имени Данила Галицкого, Львов, Украина,  
Львовский областной клинический перинатальный центр, Львов, Украина  
В статье приведены результаты исследования эндометрия у 26 пациенток с функциональной гиперпролактинемией. Доказана эффективность использования гистероскопии в оценке состояния эндометрия и выявления внутриматочной патологии у данной категории больных.

**Ключевые слова:** гистероскопия, гиперпролактинемия, эндометрий.

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V. I. Pyrohova, I. V. Vernikovskyy, N. S. Veresnyuk, Kh. V. Kozak  
USING OF HYSTEROSCOPY IN THE DETERMINATION OF STATE OF THE ENDOMETRIUM IN  
PATIENTS SUFFERING FROM HYPERPROLACTINAEMIA

The Lviv National Medical University named after Danylo Halytskyi, Lviv, Ukraine,  
Lviv Regional Clinical Perinatal Center, Lviv, Ukraine

The results of research of the endometrium in 26 patients with functional hyperprolactinaemia are represented in the article. The aim of this study was the determination of state of endometrium in women with functional hyperprolactinaemia with the help of hysteroscopy and subsequent morphological study, obtained from the material from uterine cavity.

It is well-proven efficiency of the use of hysteroscopy in the determination of state of the endometrium and exposure of intrauterine pathology at this category of patients. In 46.2% of patients with functional hyperprolactinaemia endometrial pathology was revealed with the help of hysteroscopy. Correlation between hysteroscopy and histological diagnosis is observed in 92.9% of cases. In women with functional hyperprolactinaemia the main changes in the endometrium results from the insufficient level of progesterone because of the absence of valuable corpus luteum caused by anovulation.

**Key words:** hysteroscopy, hyperprolactinaemia, endometrium.

Hyperprolactinaemia is one of the most common neuroendocrine disorders. The incidence of hyperprolactinaemia during the examination of gynecologic patients ranges from 11 to 47% according to the data of different

authors [1–3]. After screening the patients suffering from infertility, hyperprolactinaemia was detected in 18.9% of cases, and with endocrine disorders of the menstrual cycle and endocrine infertility hyperprolactinaemia

was detected in 40% of cases [4–6]. There is a great number of works dedicated to the state of endometrium in women with hyperprolactinaemia. In 1937, J. Rock and M. K. Bartlett were the first who proposed to deter-

