



Echinococcal Cyst Blockade — the Rare Cause of Acute Pancreatitis and Obstructive Jaundice

Stanislav A. Budzinsky^{1,2}, Sergei G. Shapovaliants^{1,2}, Roman V. Plakhov^{1,2}, Margarita V. Murashkina^{2,*}, Elizaveta A. Vorobieva^{1,2}, Dinara R. Berdieva², Pavel V. Usyakiy¹, Evgeniy D. Fedorov^{1,2}

¹ City Clinical Hospital No. 31 named after academician G.M. Savelyeva, Moscow, Russian Federation

² Pirogov Russian National Research Medical University, Moscow, Russian Federation

Министерства здравоохранения Российской Федерации, Москва, Российская Федерация

Aim: demonstrate an algorithm for the diagnosis and treatment of acute pancreatitis and obstructive jaundice caused by obstruction of the terminal part of the common bile duct by daughter echinococcal cyst.

Key points. The article presents a clinical case of acute echinococcal obstruction of the terminal part of the common bile duct in a patient with a complicated course of liver echinococcosis. A 33-year-old man was hospitalized with epigastrium and right hypochondrium pains and jaundice. In 2019 the patient underwent the removal of a cyst in the 7th liver segment and cholecystectomy for liver and gallbladder echinococcal lesions. Laboratory research revealed leukocytosis, hyperbilirubinemia and an increase in the transaminases level. Transabdominal ultrasound showed signs of dilatation throughout bile ducts. Duodenoscopy revealed a fixed yellowish-white oval formation with translucent capsule, completely blocking bile and pancreatic juice outflow at the major duodenal papilla. After non-cannulation endoscopic papillotomy, migration of the substrate (echinococcal cyst) into the duodenum was noted, active flow of bile and pancreatic secretions was restored. Oral transpapillary cholangioscopy was performed for a detailed bile duct examination. It revealed no echinococcal cysts, residual parasitic structures or biliary tree lesions. The treatment was completed with pancreatic stenting. After complex treatment in the intensive care and surgery unit with complete condition stabilization, the patient was discharged with recommendations for further treatment in a specialized clinic.

Conclusion. Migration of a daughter cyst from the echinococcal liver focus can cause acute blockade of the terminal part of the common bile duct and acute obstructive pancreatitis. The combination of clinical, radiological and endoscopic methods allows to diagnose and eliminate this rare complication of liver echinococcosis with subsequent successful treatment.

Keywords: ERCP, cholangioscopy, acute pancreatitis, echinococcosis, obstructive jaundice, acute blockade of the terminal portion of the common bile duct

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Эхинококковая обструкция — редкая причина острого панкреатита и механической желтухи

С.А. Будзинский^{1,2}, С.Г. Шаповальянц^{1,2}, Р.В. Плахов^{1,2}, М.В. Мурашкина^{2,*}, Е.А. Воробьева^{1,2}, Д.Р. Бердиева², П.В. Усякий¹, Е.Д. Федоров^{1,2}

¹ ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ», Москва, Российская Федерация

² ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации, Москва, Российская Федерация

Цель представления клинического наблюдения: продемонстрировать алгоритм диагностики и лечения острого панкреатита и механической желтухи, вызванных обструкцией терминального отдела общего желчного протока дочерней эхинококковой кистой.

Основные положения. Представлен клинический случай острой эхинококковой обструкции терминального отдела холедоха у пациента с осложненным течением эхинококкоза печени. Мужчина 33 лет госпитализирован с жалобами на боль в эпигастрии и правом подреберье, пожелтение кожных покровов и склер. В анамнезе

зе в 2019 г. по поводу эхинококкового поражения печени и желчного пузыря были выполнены удаление кисты 7-го сегмента печени и холецистэктомия. Выявлены лейкоцитоз, гипербилирубинемия и повышение уровня трансаминаз, при трансабдоминальном УЗИ — признаки дилатации желчевыводящих протоков на всем протяжении. При дуоденоскопии в устье большого сосочка двенадцатиперстной кишки (ДПК) обнаружено фиксированное желтовато-белое образование овальной формы с полупрозрачной капсулой, полностью блокирующее отток желчи и панкреатического сока. После выполнения неканюляционной эндоскопической папиллотомии отмечена миграция субстрата (эхинококковой цисты) в ДПК с возобновлением активного поступления желчи и панкреатического секрета. Для детального осмотра желчных протоков проведена пероральная транспапиллярная холангиоскопия. Эхинококковых цист, остаточных паразитарных структур и нарушения целостности билиарного дерева на всем протяжении выявлено не было. Вмешательство завершено панкреатическим стентированием. После комплексного лечения в отделении реанимации и хирургии и при полной стабилизации состояния пациент выписан с рекомендациями по дальнейшему лечению в специализированной клинике.

Заключение. Миграция дочерней цисты из эхинококкового очага печени может стать одной из редких причин острой блокады терминального отдела холедоха и острого обтурационного панкреатита. Сочетание клинических, лучевых и эндоскопических методов позволяет своевременно диагностировать и устранить это редкое осложнение эхинококкоза печени с последующим успешным лечением.

Ключевые слова: ЭРХПГ, холангиоскопия, острый панкреатит, эхинококкоз, механическая желтуха, острая блокада терминального отдела холедоха

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Echinococcosis of the liver is caused by cestodes of the family Taeniidae of the *Cyclophyllidae* order — *Echinococcus granulosus* (A. Batsch, 1786). *Echinococcus* has an indirect life cycle and must develop with the change of two hosts — intermediate and definitive. Human is an intermediate host, the main source of invasion for echinococcus are animals infected with mature helminths, or food grown in regions endemic for this disease. Parasites with the help of hooks fix themselves on the intestinal mucosa, from where they implant in the venous or lymphatic collectors. Most often they enter the portal vein via the superior mesenteric vein and accumulate in the liver [1].

Echinococcosis is dangerous with its complications and is rarely encountered in the clinical practice of endoscopists. Rupture of the contents of an echinococcal cyst of the liver into the biliary tract occurs in 8–35 % of all complicated cases of this parasitic disease [1]. Its clinical picture is associated with the presence of acute pancreatitis, mechanic jaundice, hepatic failure and marked immunosuppression [2]. The severity of the condition of such patients necessitates urgent diagnostic and therapeutic interventions.

Endoscopic retrograde techniques are actively used to extract echinococcal cysts migrating into bile ducts [3]. However, there are very few reports of emergency endoscopic treatment of acute blockage of the terminal portion of the common bile duct by echinococcal cysts.

Patient G., 33 years old, was urgently admitted to Clinical Hospital No. 31 named after Academician G.M. Savelyeva of the Moscow City Department of

Health on the 10th of November 2021, with complaints of epigastric and subcostal pain, skin and sclerae jaundice, nausea. These complaints had appeared four days before hospitalization and gradually increased.

From the anamnesis it is known that the patient is employed in farming industry, lives in an endemically unfavorable area for echinococcosis (Kemerovo region). In 2019, he underwent surgical removal of echinococcal cyst of the seventh liver segment and cholecystectomy for liver echinococcosis and echinococcal lesion of the gallbladder. In the postoperative period there were no clinical manifestations of disease recurrence, the patient did not receive medication.

Physical examination at the hospitalization date revealed scleral icterus and ochrodermia, moderate abdominal pain in upper regions without peritoneal symptoms.

Laboratory examination revealed leukocytosis ($11.2 \times 10^9/L$), bilirubinemia ($154.85 \mu\text{mol/L}$; direct bilirubin level — $97.86 \mu\text{mol/L}$) and increased activity of transaminases (ALT — 339.7 U/L , AST — 135.2 U/L). Transabdominal ultrasound revealed dilatation of the common bile duct up to 10.5 mm in the absence of visible inclusions in its lumen, dilation of intrahepatic bile ducts, in particular segmental bile ducts, up to 3 mm. In addition, diffuse changes of the pancreas without signs of acute inflammation were detected, the liver was unchanged.

Thirty-six hours after admittance to the surgical department against the background of complex therapy (hepatoprotective, infusion, antispasmodic) the patient's condition worsened: epigastric pain intensified and became girdle pain, multiple

vomiting started, alpha-amylase level increased up to 3390 U/L. A repeat transabdominal ultrasound revealed signs of acute edematous pancreatitis: the pancreas was thickened, head — 31 mm, body — 20 mm, tail — 27 mm, the contours were indistinct, echogenicity increased, in the omental sac in the projection of the head and body of the pancreas there was an acute fluid accumulation with the size of 43 × 21 mm. Based on the totality of clinical manifestations and examination results, the development of acute biliary pancreatitis on the background of acute blockage of the terminal choledochus was suspected, and emergency endoscopic intervention was performed.

When performing retrograde transpapillary surgery we used duodenoscope TJF-180 (Olympus, Japan), electrosurgical device ESG-300 (Olympus, Japan), instruments — needle and standard papillotome, Dormia basket, revision balloon, guide strings and pancreatic stent (Olympus, Japan; Boston Scientific, USA). An oral cholangioscope Spy Glass DSII (Boston Scientific, USA) was used for control revision of the biliary tract under visual control.

Duodenoscopy revealed a fixed yellowish-white oval-shaped mass with a translucent capsule, up to 1 cm in diameter, which partially prolapsed into the duodenal lumen and completely blocked the outflow of bile and pancreatic juice in the mouth of the large papilla of the duodenum (Fig. 1).

Using a needle papillotome (mode — Pulse Cut Slow 30, effect — 2), a non-cannulation endoscopic papillosphincterotomy (EPST) up to 10 mm long was performed, after which rapid migration of the echinococcal cyst into the duodenum and further into the jejunum was noted. Bile was actively flowing from the wide-open orifice of the common bile duct (up to 7–8 mm), and pancreatic secretion was flowing from

the mouth of the main pancreatic duct, located 4 mm lower and to the right. It is characteristic that against the background of long-term obstruction and stretching of the ampulla of the major duodenal papilla and the orifice of the common bile duct by an echinococcal cyst, there was no need for additional cannulation papillosphincterotomy (Figs. 2, 3).

On further examination, migration of the second daughter echinococcal cyst from the lumen of the choledochus to the duodenum was noted. However, both parasites could not be extracted due to their rapid withdrawal into the jejunum.

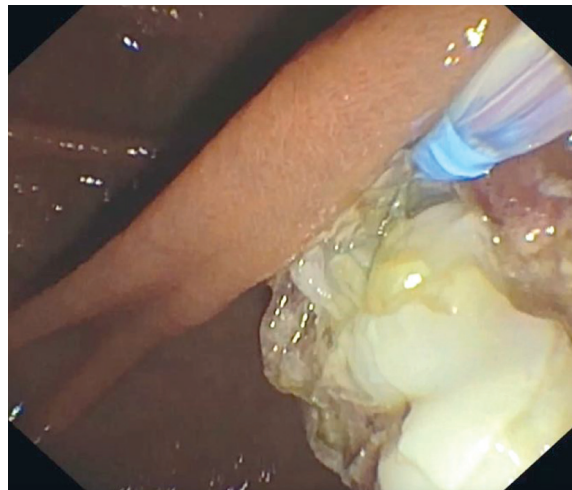


Figure 2. Non-cannulated endoscopic papillosphincterotomy with needle papillotome

Рисунок 2. Неканюляционная ЭПСТ игольчатым папиллотомом

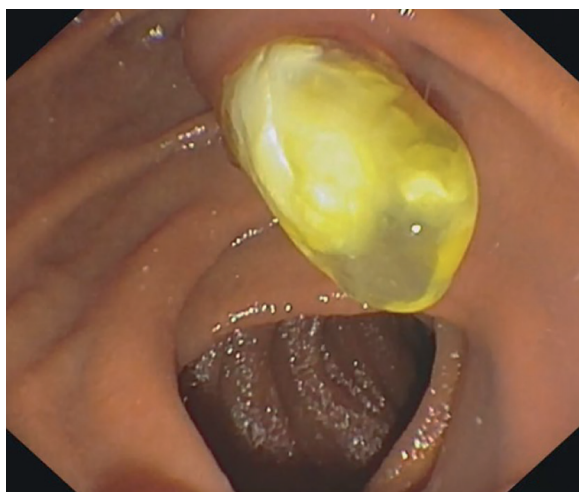


Figure 1. Duodenoscopy — blockage of the terminal portion of the common bile duct by the echinococcal cyst

Рисунок 1. Дуоденоскопия — блокада терминального отдела холедоха эхинококковой цистой

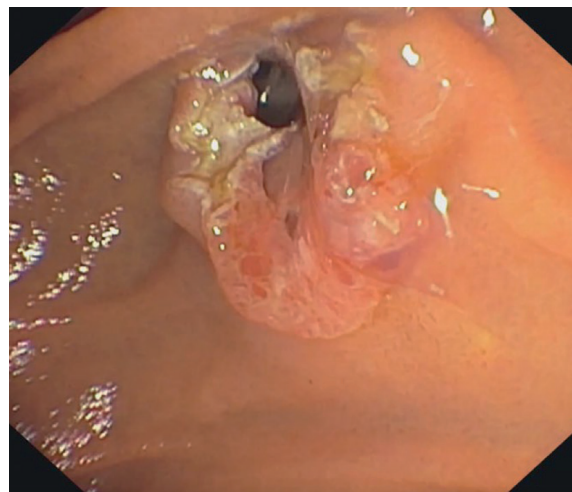


Figure 3. Wide opening of the choledochal orifice after incision and migration of the echinococcal cyst

Рисунок 3. Широкое раскрытие устья холедоха после выполнения разреза и миграции эхинококковой цисты

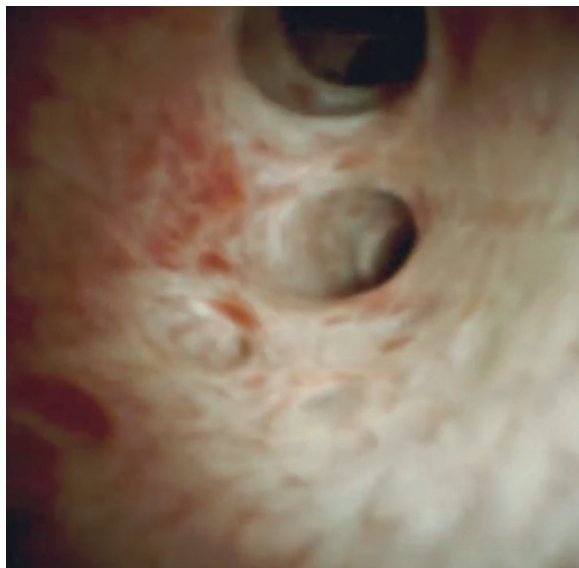


Figure 4. Peroral transpapillary cholangioscopy — hyperemia of mucosa bile ducts, increased vascular pattern, moderate focal infiltration of mucosa with petechial haemorrhages

Рисунок 4. Пероральная транспапиллярная холангиоскопия — гиперемия слизистой оболочки желчных протоков, усиленный сосудистый рисунок, умеренная очаговая инфильтрация слизистой оболочки с наличием петехиальных кровоизлияний

Peroral transpapillary cholangioscopy was performed for additional visual inspection of the biliary tract and verification of the diagnosis. The biliary tree was examined from the segmental ducts and the confluence to the EPST area. The lobular and segmental ducts on the left and on the right were dilated up to 7–8 mm, at that the mucosa of the bile ducts was hyperemic all over, vascular pattern intensification, its moderate focal infiltration with petechial hemorrhages were noted. The most pronounced changes were recorded in the ductal system of the left lobe of the liver. However, no foreign bodies, pathologic tissue formations, abnormally tortuous vessels and ulcerations were found (Fig. 4).

Taking into consideration the clinical findings of acute biliary pancreatitis, the intervention was completed by therapeutic pancreaticoduodenal stenting with a plastic endoprosthesis with bilateral Amsterdam-type flaps with a diameter of 7 Fr and a length of 5 cm (Figs. 5, 6).

Due to the severe current of acute pancreatitis after endoscopic intervention, the patient was transferred to the intensive care department, where complex treatment including infusion, antibacterial, anticoagulant and gastroprotective therapy was carried out for 6 days. On the background of positive clinical dynamics, pain relief and normalization

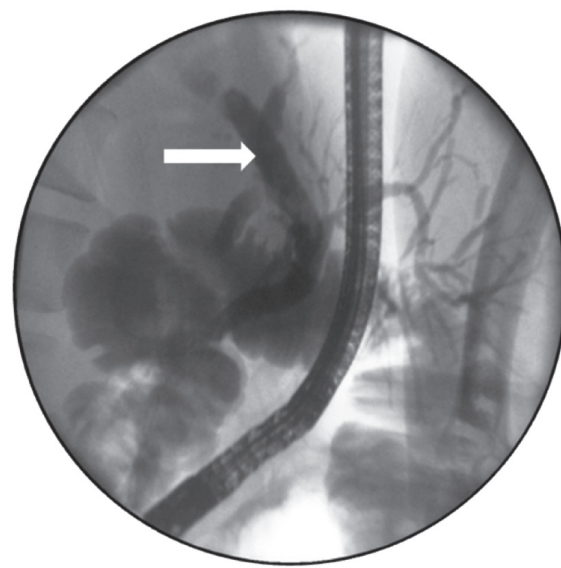


Figure 5. Endoscopic retrograde cholangiography — severe dilatation of the biliary tree with terminal choledochal blockage, mainly due to dilatation of the right lobe duct

Рисунок 5. Эндоскопическая ретроградная холангиография — выраженная дилатация желчного дерева при блокаде терминального отдела холедоха, преимущественно за счет расширения правого долевого протока

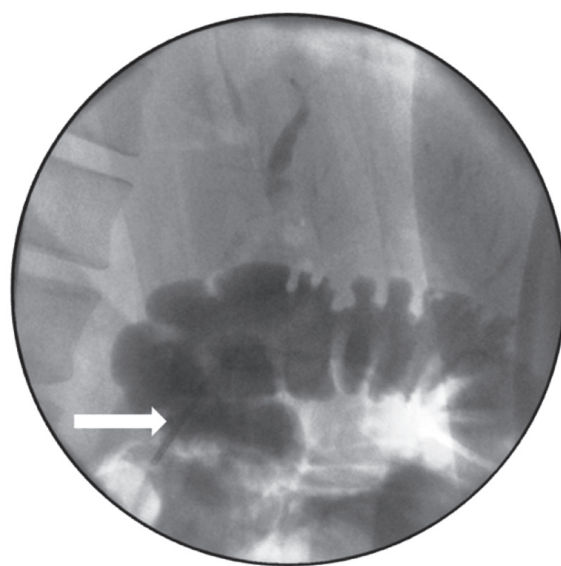


Figure 6. Pancreatic stent inserted

Рисунок 6. Установленный панкреатический стент

of biochemical blood parameters the patient was transferred to the surgical department.

Seven days after the endoscopic surgery, the control ultrasound of abdominal cavity organs registered the increase of parapancreatitis signs and the increase of the acute fluid accumulation focus volume

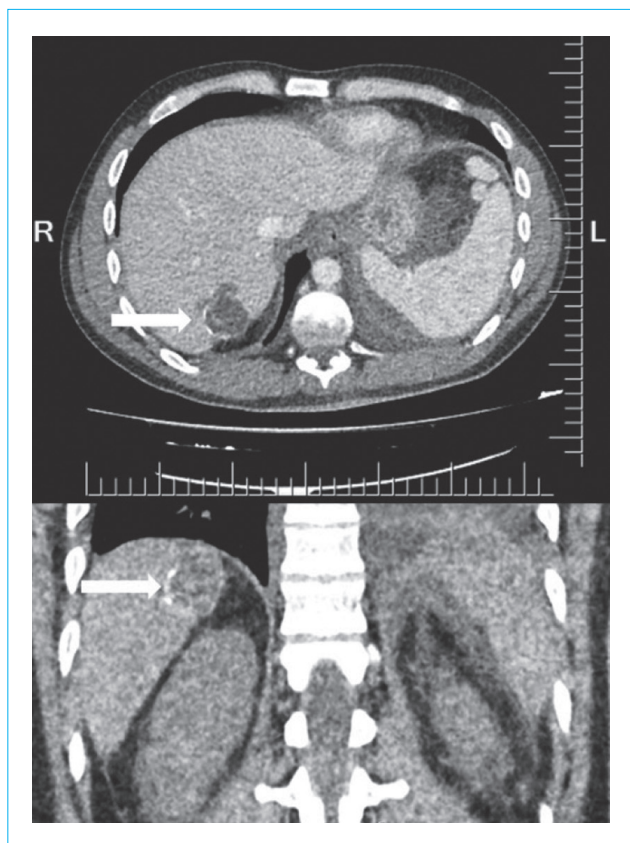


Figure 7. CT scan of the abdominal organs. Echinococcal focus of “honeycomb” structure in the seventh segment of the liver

Рисунок 7. Компьютерная томография органов брюшной полости. Эхинококковый очаг «сотовой» структуры в седьмом сегменте печени

in the omental sac 56×32 mm, in this connection its transcutaneous drainage was performed under ultrasound control with a 10 Fr (3.1 mm) diameter drain — a small amount (up to 30 ml) of turbid brown-colored fluid (culture-sterile) was obtained.

At the control CT scan of abdominal cavity organs on the 10th day after surgery, there were no signs of acute pancreatitis, and the phenomena of parapancreatitis resolved. A multiseptal echinococcal cyst of “honeycomb” structure, 5×4 cm in size, was visualized in the seventh segment of the liver. Thus, the fact of recurrence of hepatic echinococcosis was stated. The daughter cysts were located on the inner and outer sides of the cyst, which could indicate partial destruction of the chitinous shell and the risk of repeated migration of echinococcal cysts into the bile ducts (Fig. 7).

When performing repeated control peroral transpapillary cholangioscopy for dynamic assessment of inflammatory process and exclusion of repeated migration of echinococcal cysts into bile ducts on the 11th day after primary endoscopic intervention, no signs of echinococcal cysts presence in the lumen of

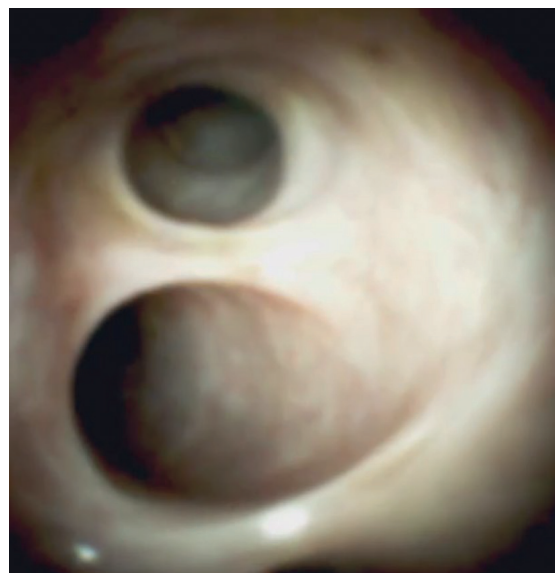


Figure 8. Peroral transpapillary cholangioscopy — positive dynamic

Рисунок 8. Пероральная транспапиллярная холангиоскопия — положительная динамика

bile ducts up to subsegmental ones were revealed. The supposed complication between multiseptal echinococcal cyst of the seventh segment and biliary tract was not detected either. At the same time complete disappearance of inflammatory changes of the biliary tree mucosa revealed at the initial examination was noted (Fig. 8).

In the serologic blood test, a high titer of IgG to echinococcus ($>1/200$) was recorded, which also confirmed the echinococcal nature of the disease.

The patient on the 19th day of hospitalization and on the 17th day after primary endoscopic intervention was discharged in satisfactory condition with the recommendation to continue treatment of liver echinococcosis in a specialized institution. The patient applied to the Institute of Parasitology, where the recurrence of hepatic echinococcosis was confirmed, therapy with albendazole (200 mg 2 times a day) and heptral (400 mg 2 times a day) was prescribed with the recommendation of further surgical treatment.

Conclusion

A migrated daughter cyst from an echinococcal focus in the liver may be a nontrivial cause of acute blockage of the terminal choledochus and rapidly developing acute obstructive pancreatitis. The combination of clinical, radiation and endoscopic methods of treatment allows timely diagnosis and elimination of this rare complication of hepatic echinococcosis.

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Information about the authors

Stanislav A. Budzinskiy — Dr. Sci. (Med.), Senior Researcher, Research Laboratory of Surgical Gastroenterology and Endoscopy, Department of Hospital Surgery No. 2, Faculty of Medicine, Pirogov Russian National Research Medical University; Physician-Endoscopist, Head of the Endoscopy Unit, City Clinical Hospital No. 31 named after Academician G.M. Savelyeva.

Contact information: stanislav.budzinskiy@mail.ru;
119415, Moscow, Lobachevskogo str., 42.
ORCID: <https://orcid.org/0000-0003-4255-0783>

Sergei G. Shapovaliants — Dr. Sci. (Med.), Professor, Head of the Department of Hospital Surgery No. 2 with Research Laboratory of Surgical Gastroenterology and Endoscopy, Faculty of Medicine, Pirogov Russian National Research Medical University.

Contact information: sgs31@mail.ru;
119415, Moscow, Lobachevskogo str., 42.
ORCID: <https://orcid.org/0000-0002-1571-8125>

Roman V. Plakhov — Dr. Sci. (Med.), Professor, Professor of the Department of Hospital Surgery No. 2, Faculty of Medicine, Pirogov Russian National Research Medical University; Surgeon, City Clinical Hospital No. 31 named after Academician G.M. Savelyeva.

Contact information: roma_vp@mail.ru;
119415, Moscow, Lobachevskogo str., 42.
ORCID: <https://orcid.org/0000-0001-7197-0985>

Margarita V. Murashkina* — Surgeon, postgraduate student of the Department of Hospital Surgery No. 2, Faculty of Medicine with the Research Laboratory of Surgical Gastroenterology and Endoscopy, Pirogov Russian National Research Medical University.

Contact information: Dr.Murashkina@yandex.ru;
119415, Moscow, Lobachevskogo str., 42.
ORCID: <https://orcid.org/0000-0002-1327-8912>

Elizaveta A. Vorobyeva — Researcher, Research Laboratory of Surgical Gastroenterology and Endoscopy, the Department of Hospital Surgery No. 2, Faculty of Medicine, Pirogov Russian National Research Medical University; Physician-Endoscopist, City Clinical Hospital No. 31 named after Academician G.M. Savelyeva.

Contact information: lizenok-mus@mail.ru;
119415, Moscow, Lobachevskogo str., 42.
ORCID: <https://orcid.org/0000-0002-5366-2492>

Сведения об авторах

Будзинский Станислав Александрович — доктор медицинских наук, старший научный сотрудник научно-исследовательской лаборатории хирургической гастроэнтерологии и эндоскопии при кафедре госпитальной хирургии № 2 лечебного факультета ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации; врач-эндоскопист, заведующий отделением эндоскопии ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ».

Контактная информация: stanislav.budzinskiy@mail.ru;
119415, г. Москва, ул. Лобачевского, 42.
ORCID: <https://orcid.org/0000-0003-4255-0783>

Шаповальянц Сергей Георгиевич — доктор медицинских наук, профессор, заведующий кафедрой госпитальной хирургии № 2 лечебного факультета с НИЛ хирургической гастроэнтерологии и эндоскопии ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации.

Контактная информация: sgs31@mail.ru;
119415, г. Москва, ул. Лобачевского, 42.
ORCID: <https://orcid.org/0000-0002-1571-8125>

Плахов Роман Валентинович — доктор медицинских наук, профессор кафедры госпитальной хирургии № 2 лечебного факультета ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации; врач-хирург ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ».

Контактная информация: roma_vp@mail.ru;
119415, г. Москва, ул. Лобачевского, 42.
ORCID: <https://orcid.org/0000-0001-7197-0985>

Мурашкина Маргарита Владимировна* — врач-хирург, аспирант кафедры госпитальной хирургии № 2 лечебного факультета с НИЛ хирургической гастроэнтерологии и эндоскопии ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации.

Контактная информация: Dr.Murashkina@yandex.ru;
119415, г. Москва, ул. Лобачевского, 42.
ORCID: <https://orcid.org/0000-0002-1327-8912>

Воробьева Елизавета Александровна — научный сотрудник научно-исследовательской лаборатории хирургической гастроэнтерологии и эндоскопии при кафедре госпитальной хирургии № 2 лечебного факультета ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации; врач-эндоскопист ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ».

Контактная информация: lizenok-mus@mail.ru;
119415, г. Москва, ул. Лобачевского, 42.
ORCID: <https://orcid.org/0000-0002-5366-2492>

* Corresponding author / Автор, ответственный за переписку

Dinara R. Berdieva — Surgeon, postgraduate student of the Department of Hospital Surgery No. 2, Faculty of Medicine with the Research Laboratory of Surgical Gastroenterology and Endoscopy, Pirogov Russian National Research Medical University.

Contact information: dii_berdieva@mail.ru;

119415, Moscow, Lobachevskogo str., 42.

ORCID: <https://orcid.org/0000-0002-5019-2157>

Pavel V. Usyaky — Cand. Sci. (Med.), Surgeon, City Clinical Hospital No 31 named after Academician G.M. Savelyeva.

Contact information: Pavel.usyakiy@yandex.ru;

119415, Moscow, Lobachevskogo str., 42.

ORCID: <https://orcid.org/0000-0001-5738-1586>

Evgeniy D. Fedorov — Dr. Sci. (Med.), Professor, Chief Researcher, Research Laboratory of Surgical Gastroenterology and Endoscopy, the Department of Hospital Surgery No. 2, Faculty of Medicine, Pirogov Russian National Research Medical University; Clinical Supervisor, Endoscopic Surgery Unit, City Clinical Hospital No. 31 named after Academician G.M. Savelyeva.

Contact information: efedo@mail.ru;

119415, Moscow, Lobachevskogo str., 42.

ORCID: <https://orcid.org/0000-0002-6036-7061>

Бердиева Динара Руслановна — врач-хирург, аспирант кафедры госпитальной хирургии № 2 лечебного факультета с НИЛ хирургической гастроэнтерологии и эндоскопии ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации.

Контактная информация: dii_berdieva@mail.ru;

119415, г. Москва, ул. Лобачевского, 42.

ORCID: <https://orcid.org/0000-0002-5019-2157>

Усякий Павел Валерьевич — кандидат медицинских наук, врач-хирург ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ».

Контактная информация: Pavel.usyakiy@yandex.ru;

119415, г. Москва, ул. Лобачевского, 42.

ORCID: <https://orcid.org/0000-0001-5738-1586>

Федоров Евгений Дмитриевич — доктор медицинских наук, профессор, главный научный сотрудник научно-исследовательской лаборатории хирургической гастроэнтерологии и эндоскопии при кафедре госпитальной хирургии № 2 лечебного факультета ФГАОУ ВО «Российский национальный исследовательский медицинский университет им. Н.И. Пирогова» Министерства здравоохранения Российской Федерации; клинический руководитель отделения эндоскопической хирургии ГБУЗ «ГКБ № 31 им. академика Г.М. Савельевой ДЗМ».

Контактная информация: efedo@mail.ru;

119415, г. Москва, ул. Лобачевского, 42.

ORCID: <https://orcid.org/0000-0002-6036-7061>

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