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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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IMPROVEMENT OF SURGICAL TREATMENT OF ACUTE BILIARY PANCREATITIS

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Abstract.

This prospective study was conducted at the University Hospital of NCJSC "SMU" (Semey Medical University, Non-Commercial Joint-Stock Company (NCJSC) of Semey, Kazakhstan).

Purpose of the study: Improving the surgical treatment of biliary pancreatitis by using a universal retractor and improved methods of omentobursostomy with drainage of the omental bursa.

Study design: Non-randomized controlled clinical trial

Materials and methods: This study included thirty-nine patients who underwent surgical procedures between October 2022 and September 2023 in Semey, located in the Abay region. The study examined the general characteristics of surgical interventions performed for acute biliary pancreatitis using our proposed treatment methods and devices to improve the outcomes of acute biliary pancreatitis. Open surgery was indicated when simultaneous surgical intervention on the gallbladder, bile ducts, pancreas, and retroperitoneal space was necessary.

Results: The study included 39 participants (100%), with 26 women (66.7%) and 13 men (33.3%). The average age of the participants was 48.6±1.2 years. The most common clinical manifestations of acute biliary pancreatitis observed in the study were abdominal pain (100%), fever (46.1%), and chills (41%). Dyspeptic symptoms such as nausea and vomiting were present in 48.7% of participants, while symptoms of cholestasis and skin itching were observed in 23%. All 39 patients (100%) experienced pain, with 13 (33.4%) experiencing girdle pain and 12 (30.7%) experiencing epigastric pain. The most common location of pain was under the right hypochondrium in 14 (35.9%) patients. The most frequent surgical intervention was cholecystectomy with drainage of the common bile duct (CBD) performed in 43.5% (n=17) of cases. Other surgical interventions included choledochoduodenostomy (CDD) according to the Yurash-Vinogradov method in 18% (n=7), hepaticojejunostomy according to Roux-en-Y in 7.7% (n=3), and laparotomy with dissection of the pancreatic capsule with abdominalization in 7.7% (n=3). A developed method was applied in 5.1% (n=2) cases, where acute biliary pancreatitis was complicated by infected pancreatic necrosis, requiring urgent necrectomy, sanitation of the omental bursa and parapancreatic tissue. In these cases, laparotomy with cholecystectomy + drainage of the CBD with omentobursostomy and retroperitonealostomy was performed. Endoscopic interventions were used in 18% (n=7) cases.

Conclusions: Thus, complications after surgical treatment of biliary pancreatitis occurred in 17.9% (n=7) of patients, including bile leakage at the site of the drainage tube placement 2.6% (n=1), biliodigestive anastomosis failure 2.6% (n=1), scar stenosis of the terminal part of the common bile duct after drainage 5.1% (n=2), increased severity of acute pancreatitis 5.1% (n=2) after endoscopic lithotripsy, fluid accumulation in the subcutaneous tissue (seroma) 5.1% (n=2). There were 5.1% (n=2) deaths. The causes of death were recurrent erosive bleeding with total pancreatic necrosis and septic shock with the development of multi-organ dysfunction.

In complicated cases of acute biliary pancreatitis, when there was a need for simultaneous surgical intervention on the gallbladder, bile ducts, pancreas, and retroperitoneal space, we used our developed universal wound expander (EAPO No. 038346 dated 12.08.2021). The wound expander allows for better visibility of the surgical field and significantly facilitates the surgeon's work during the surgical procedure. The double-lumen spiral drain (No. 7691 dated 13.10.2023) provides adequate drainage and continuous flushing, as well as irrigation with medications to prevent further destruction of the pancreatic parenchyma and the development of purulent-septic complications. To monitor the dynamics of treatment for pancreatic necrosis during subsequent sanations, we also used the method of omentobursoscopy (No. 36736 dated 02.08.2024) in the postoperative period, which allowed for controlled manipulations in the omental bursa and retroperitoneal space, creating conditions for higher quality and safer work for the surgeon in the treatment of acute purulent pancreatitis.

Key words. Biliary pancreatitis, pancreatic necrosis, cholelithiasis, cholecystectomy, endoscopy, surgery.

Introduction.

One of the main causes of biliary pancreatitis is diseases of the biliary tract. The incidence of biliary pancreatitis accounts for 26% to 60% of cases of acute pancreatitis [1]. Chronicization of acute biliary pancreatitis reaches 43% of cases [2]. Etiopathogenetic predictors of the formation of biliary pancreatitis are impaired outflow through the extrahepatic biliary tract and the ductal system of the pancreas, the development of biliary-pancreatic reflux with the development of intraductal hypertension [3,4]. The prerequisites for the development of acute pancreatitis in cholelithiasis are its anatomical and physiological connection of the pancreatobiliary system [5].

Given the constant increase in the number of patients with cholelithiasis and biliary pancreatitis, the study of the role of surgical interventions in their treatment remains relevant and requires further development.

Objective. Improving the surgical treatment of biliary pancreatitis by using a universal retractor and improved methods of omentobursostomy with drainage of the omental bursa.

Research Methods.

This study is based on the results of a prospective analysis of data from the examination and treatment of 39 patients who were treated at the University Hospital of NCJSC "SMU" from 2022-2023. The majority of patients were women (26, 66.6%), while men comprised 13 (33.3%). The average age was (48.6±1.2) years. All patients had gallstone disease with acute pancreatitis.

Inclusion criteria included patients with gallstone disease (acute and chronic calculous cholecystitis) with clinical manifestations of biliary pancreatitis, confirmed by imaging (computed tomography, retrograde cholangiopancreatography, ultrasound) and biochemical methods, and patients with postcholecystectomy syndrome with clinical manifestations of biliary pancreatitis. Exclusion criteria included patients with gallstone disease (acute and chronic calculous cholecystitis) without clinical manifestations of biliary pancreatitis, patients in extremely critical condition, patients with mental disorders who were inaccessible for contact, patients with alcoholic and autoimmune pancreatitis. The study was conducted in accordance with the ethical guidelines of the Declaration of Helsinki and approved by the Ethics Committee of the State Medical University of Semey (Protocol 2 dated October 10, 2022, y).

Characteristics of Research Methods.

To determine the etiology of biliary pancreatitis, the degree of obstruction, and the severity of changes in the hepatobiliary system, we used standard sets of studies.

The following research methods were used in the study: 1. Physical examination of patients; 2. Laboratory diagnostics; 3. Ultrasound of the abdominal cavity and abdominal space (as the main screening method, it allows to clarify the presence of complications of cholelithiasis and the level of obstruction, the degree of biliary hypertension, as well as to identify changes in parenchymal organs); 4. Video esophagogastroduodenoscopy examination of the major duodenal papilla; 5. Electrocardiography; 6. Multislice computed tomography; 7. Intraoperative cholangiography; 8. Intraoperative fibrocholedochoscopy; 9. Postoperative fistulocholangiography; 10. Omentobursocopy.

Objective Examination and Laboratory Studies.

All patients underwent a general clinical examination including a complete blood count, urinalysis, biochemical blood test (general, direct and indirect bilirubin levels, amylase, total blood protein, blood glucose, aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase, urea, creatinine, residual nitrogen), coagulation test, blood type and Rh factor, and blood test for human immunodeficiency virus (HIV), hepatitis "B" and "C".

Before surgery, all patients were examined by a therapist and related specialists in connection with any coexisting diseases.

All patients were thoroughly informed about their illness, including the complications of cholelithiasis and biliary pancreatitis: choledocholithiasis, treatment methods, as well as possible complications in the intraoperative and postoperative periods. The possibilities of advanced methods in the clinic, recommended to patients, were fully explained before surgery.

Ultrasound examination (US): was performed on all patients upon hospital admission, as well as for dynamic monitoring on the 3rd and 7th days after surgery. The main significance of the generally accepted criteria for ultrasound examination of the pathology is reliable and indirect visualization.

During the examination, the following signs are taken into account: - the presence of gallstones and stones in the common bile duct (with an indication of the number, shape and size of stones); - the size of extrahepatic (outside the liver) and intrahepatic (inside the liver) bile ducts; - longitudinal scar narrowing (strictures) of the bile ducts; - the presence of stones in the terminal part of the common bile duct; - the volume and changes in the pancreas are assessed; - the presence of an increase in the common pancreatic duct; - the presence of fluid accumulation in the omental bursa; - the presence of other pathologies of the abdominal cavity.

The tactics, timing of surgery and prognosis of possible complications during the operation depended on the results of the ultrasound.

If pathological formations with the common bile duct, acoustic shadow are detected, this confirms choledocholithiasis, the conclusion of the ultrasound examination is presented in Figure 1.

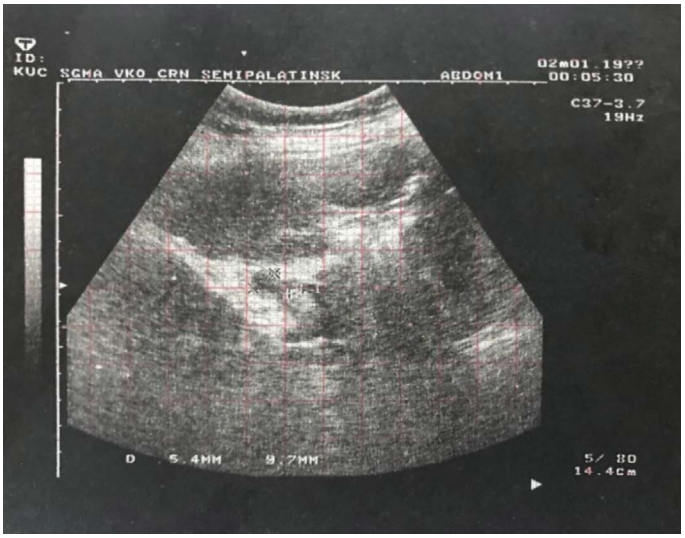

Figure 1. *Ultrasound (multiple stones in the common bile duct).*

Signs of choledocholithiasis are an increase in the diameter of the common bile duct more than 9-12 mm, echo structure without acoustic shadow and dilatation of the Virsung duct more than 3-4 mm.

Ultrasonic signs suggestive of cholangitis include thickening of the bile duct walls; dilatation of the bile ducts; suspension, which determines further diagnostic and therapeutic measures in patients with biliopancreatic duodenal region pathology.

The informativeness of ultrasound in detecting biliary hypertension is high - 97.5% (36 patients).

Video esophagogastroduodenoscopy (VEGDS) is an endoscopic method of examination that allows for the assessment of the mucous membrane of the duodenum and the common bile duct (CBD), evaluating its shape, size, location, and identifying the presence of inflammatory changes. During the endoscopic examination, special attention was paid to the

descending part of the duodenum in the area of the Vater's papilla exit, assessing the presence of anatomical features of the minimally invasive surgical intervention zone, the condition of the CBD - the presence of papillitis, signs of an impacted stone, tension, and degree of edema of the CBD. Video esophagogastroduodenoscopy allows for the selection of the correct tactics for performing major surgical interventions. It provides a high possibility of assessing the condition and complications of the performed choledochoduodenostomy (CHD) both intraoperatively and postoperatively.

Multispiral computed tomography (MSCT) is a research method that allows for the determination of the cause of biliary pancreatitis in cases where ultrasound and MRCP cannot provide an accurate Figure. It was used as an additional method in complex diagnostic situations. The main goal of MSCT is to exclude tumors of the pancreatoduodenal region and research, which is of great importance in the diagnosis of stones, as well as defects of the pancreatobiliary system The conclusion of the study is shown in Figure 2.

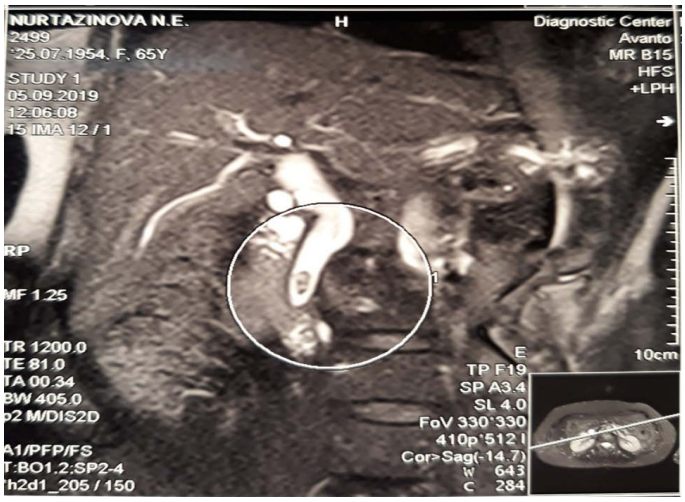

Figure 2. *Multispiral Computed Tomography (multiple choledocholithiasis).*

Results.

A comprehensive analysis of the experience of treating 39 patients with acute biliary pancreatitis who required surgical treatment was carried out Table 1.

Table 1. *Main clinical symptoms.*

Clinical features of the disease	General sample. N=39	
	Abc.	%
Fever	18	46,1
Chills	16	41
Pain syndrome	39	100
Nausea/vomiting	19	48,7
General weakness	21	53,8
Skin itching	9	23

Among the main clinical manifestations of acute biliary pancreatitis in the general sample: abdominal pain syndrome 100%, fever (46.1%), chills (41%). Acute gastrointestinal symptoms such as nausea and vomiting (48.7%). Symptoms of cholestasis, skin itching (23%). Table 2 shows data on the localization of pain syndrome.

All 39 (100%) patients experienced pain during the study. Girdle pain was observed in 13 (33.4%) patients, and epigastric pain in 12 (30.7%). The most common location of pain was under the right costal margin in 14 (35.9%) patients Table 3.

Table 2. *Localization of pain sensations.*

Localization of pain sensations	General sample, (n=39)	
	Abc.	%
In the upper central abdomen	12	30,7
In the upper right abdomen	14	35,9
Around the waist	13	33,4
Not localized to a specific area	4	10,2

Table 3. *The etiological factors in patients with acute biliary pancreatitis.*

Causes of biliary pancreatitis	General sample, (n=39)	
	Abc.	%
Cholelithiasis (gallstones) + multiple choledocholithiasis (stones in the common bile duct) + mechanical jaundice + acute biliary pancreatitis	21	53,8
CH + MCHL + wedged stone of Vater's papilla + MJ + acute biliary pancreatitis	9	23,1
Postcholecystectomy syndrome (PCSS), residual choledocholithiasis (RCHL) + acute biliary pancreatitis.	5	12,8
Post-cholecystectomy syndrome (PCS) + prolonged scar narrowing of the bile ducts and the terminal part of the common bile duct + acute biliary pancreatitis	3	7,7

Table 4. *The nature of concomitant diseases.*

Nature of concomitant diseases	General sample, (n=39)	
	Abc.	%
Ischemic heart disease	29	80,5
Hypertension disease	18	50
Type I and Type II Diabetes	9	25
Kidney and urinary system diseases	7	19,4
Gastrointestinal diseases	17	47,2
Respiratory disease	13	36,1
Vascular diseases of the extremities	9	25
Obesity	27	75

The main reasons for the development of pancreatitis were calculous cholecystitis (53.8%), calculous cholecystitis and multiple choledocholithiasis in combination with an impacted stone of the Vater's papilla (23.1%), a combination of PCSS and residual choledocholithiasis (12.8%), PCSS + extensive scar narrowing of the bile ducts and the terminal part of the common bile duct (7.7%).

Among the total sample, 36 (92.3%) patients had concomitant diseases.

Note: The presence of a larger number of concomitant diseases compared to the number of patients is due to the fact that one patient had up to 2-3 concomitant diseases, shown in table 4.

Among the accompanying diseases, common ones are cardiovascular diseases, gastrointestinal diseases, as well as

Table 5. *Types of surgical interventions performed for acute biliary pancreatitis.*

Surgical operation	**Sample n=39 (100%)**	
	Abc	%
Cholecystectomy with drainage of the common bile duct.	17	43,5
Choledochoduodenostomy (CDD) according to Yurash-Vinogradov	7	18
Hepaticojejunostomy according to Roux-en-Y	3	7,7
Laparotomy with cholecystectomy + drainage of the common bile duct + omentobursostomy + drainage of the omental bursa	2	5,1
Laparotomy with pancreatic capsule incision and abdominalization.	3	7,7
Papillosphincterotomy + Lithoextraction	7	18

obesity, which somewhat exacerbates the general condition of patients in the intraoperative and postoperative periods.

Table 5 presents the types of surgical procedures performed on patients with acute pancreatitis of biliary origin. Cholecystectomy with common bile duct (CBD) drainage was the most frequent intervention, performed in 43.5% (n=17) of cases. Choledochoduodenostomy (CHD) according to the Yurash-Vinogradov method was performed in 18% (n=7), hepaticojejunostomy according to Roux-en-Y in 7.7% (n=3), and laparotomy with incision of the pancreatic capsule with abdominalization in 7.7% (n=3). The developed method was used in 5.1% (n=2) cases, where acute biliary pancreatitis was complicated by infected pancreatic necrosis, requiring urgent necrectomy, sanitation of the omental sac and parapancreatic tissue - laparotomy with cholecystectomy + CBD drainage with omentobursostomy and retroperitonealostomy was performed. Endoscopic interventions were used in 18% (n=7) cases.

In complicated cases of acute biliary pancreatitis, when simultaneous surgical intervention on the gallbladder, bile ducts, pancreas, and retroperitoneal space was necessary, we used the "Universal retractor" developed by us.

The task of the device we developed is to create a simpler design of the early expander, reduce the number of parts of the device, create comfortable conditions for the surgeon, and the technical result was to create a good view and access to organs as a result of translational and uniform spreading of the wound edges and removal of organs with rigid fixation to improve the quality of surgery.

The problem is solved in that the Universal retractor contains a fastening unit to the operating table (1), two vertical posts (2), four horizontal semi-arc consoles which are fastened to the posts by a clamping system (3); the semi-arc consoles (4) in turn can be connected into two arc-shaped consoles by means of a coupling sleeve; the upper arc-shaped console is directed towards the upper part of the operating table, which is divided into two equal parts; the two lower consoles are directed towards the lower part of the operating table; the consoles have narrowing's at the bending points so that the clamping mechanism of the toothed rack bar (5) moves freely along its entire length; clamping mechanisms with a toothed rack mechanism are carried into the semi-arc consoles, the distal ends of the bars of the toothed rack mechanism contain a mushroom-shaped retainer (6) for which mirrors of any size and shape (7) are fixed in turn. The complete set of the universal retractor is shown in Figure 3.

The proposed Universal retractor allows creating conditions for better and safer work of the surgeon during operations on abdominal organs. The invention allows for a better view of the surgical field and significantly facilitates the surgeon's work.

A Eurasian patent was obtained, and a formal expert review was passed, registration number EAPO No. 038346 dated August 12, 2021 for the "Universal Early Expander".

In the study, the universal early expander was used in n=12 (30.7%) patients, conversion from mini-laparotomy access was

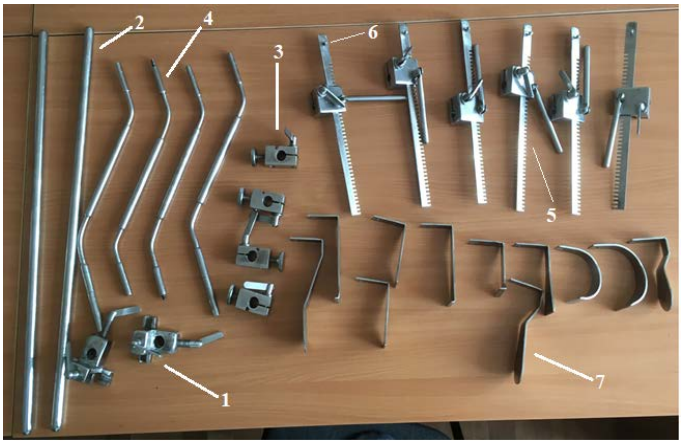

Figure 3. *Universal Early Expander: Configuration.*

Figure 4. *Universal wound expander in different assembly variations.*

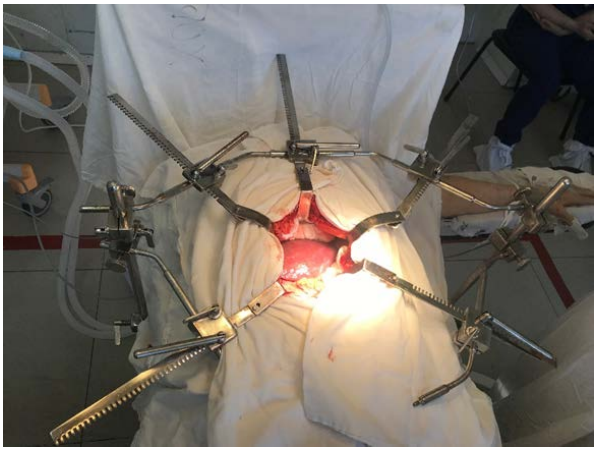

Figure 5. *Universal wound expander assembled during surgery.*

4 (10.2%) patients. The average duration of the operation was 80 minutes (Figures 4 and 5).

In patients who underwent open surgery, we installed a spiral double-lumen drain developed by us, consisting of two polyvinyl chloride tubes. The first one has a large diameter of up to 15 mm (1), which is inserted into the omentobursostomy opening in the area of the head and body of the pancreas and the retroperitoneal space. The tube is made in the form of a hollow cylinder, the internal space of which is an irrigation channel with one spiral, long, slit window, quite wide in size up to 0.3 cm, made helically at an angle (2). And also, the second one is inserted into it - a polyvinyl chloride tube with a smaller diameter of up to 5 mm (3) with multiple lateral, oval holes with a diameter of up to 2 mm (4), creating a double-lumen drainage for flow-through washing and local irrigation with drugs (antibiotics, enzyme inhibitors, etc.).

During surgery for pancreatic necrosis, the omental sac is opened. After decapsulation of the pancreas and necrectomy, omentobursostomy is performed. Then, a double-lumen drain is inserted into the omentobursostomy: the outer - polyvinyl chloride tube having one spiral, long, slit window and the inner - polyvinyl chloride tube with multiple, which are installed in the area of the head and body of the pancreas along and parallel to the pancreas.

Thus, the proposed device provides adequate drainage and flow lavage, as well as irrigation with drugs to prevent further destruction of the pancreatic parenchyma and the development of purulent-septic complications, for which a Patent of the Republic of Kazakhstan for a utility model “Spiral double-lumen drain for drainage of the omental sac in pancreatitis” No. 7691 dated 13.10.2023 was obtained (Figure 6).

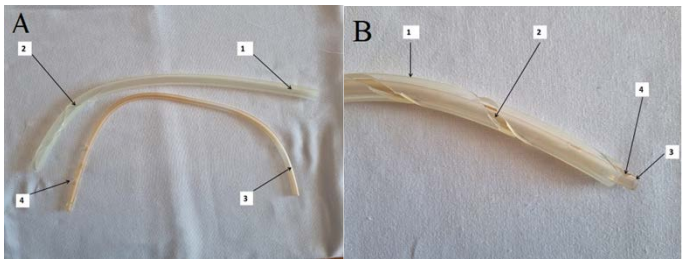

Figure 6. *“Spiral drainage”. (A)– Components, (B) – irrigation part of the drainage, general view.*

This two-lumen spiral drainage was installed in n=5 (12.8%) patients who underwent laparotomy with cholecystectomy + drainage of the common bile duct + omentobursostomy + drainage of the omental bursa and laparotomy with dissection of the pancreatic capsule with abdominalization. There were no complications in the postoperative period in these patients.

Method of omentoburso and retroperitonealostomy in pancreatic necrosis Currently, the use of open methods for treating complicated forms of acute pancreatitis has not lost its relevance. Despite the introduction of the new “step-up” approach, which involves the phased use of surgical methods from minimally invasive methods of draining the omental bursa to laparoscopic necrectomy, there are cases when it is necessary to perform surgical intervention with laparotomy access with drainage of the abdominal cavity and retroperitoneal space and formation of omentobursostomy.

The key to successful surgical treatment of pancreatic necrosis is adequate drainage of the omental bursa and retroperitoneal space to ensure free and constant drainage of wound discharge. For this purpose, different drainage options have been proposed, both for the omental bursa and the abdominal cavity.

The method is performed as follows: after opening the omental bursa, the pancreatic capsule is dissected along its upper and lower edges to the tail. Then, the retroperitoneal space is opened with removal of exudate and areas of necrosis. The retroperitoneal paranephric, paracolic space is opened, the retroperitoneal space of the root of the transverse colon and small intestine is opened. Drainage of the retroperitoneal space along the pancreas along its upper and lower edges with two drainage tubes with a diameter of - 7.0 mm. is performed after sanitation. The omental bursa is sanitized and drained with two drains with a diameter of 1.0 cm. Omentoburso and retroperitonealostomy are applied. Drainage of the left lateral canal, the lesser pelvis, the right subhepatic space with drainage tubes with a diameter of - 1.5 cm.

This drainage method fully ensures the active removal of exudate and lytic necrotic tissues from the area occupying the entire surface of the pathological focus, reducing the absorption of toxins into the bloodstream, as well as preventing the formation of purulent infiltrates and cavities, eliminates repeated surgical interventions, achieves constant controlled drainage, thereby minimizing the spread of pathological discharge into the free abdominal cavity and into the retroperitoneal tissue (Figure 7).

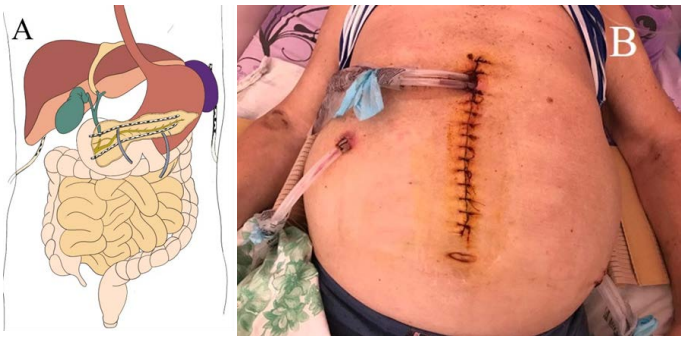

Figure 7. *(A) - Diagram of omentoburso and retroperitonealostomy in case of pancreatic necrosis. (B) - Patient after surgery.*

A patent of the Republic of Kazakhstan was obtained for the "Method of omentoburso and retroperitonealostomy in case of pancreatic necrosis" No. 36736 dated 02.08.2024.

The method of omentoburso and retroperitonealostomy in case of pancreatic necrosis was performed in n=2 (5.1%) patients, taking into account the presence of an infiltrate with multiple foci of hemorrhage in the parapancreatic tissue, as well as in the paranephric, paracolic and retroperitoneal space and foci of steatonecrosis. All patients were discharged in satisfactory condition.

A frequent problem after postoperative admission of patients with pancreatic necrosis is poor active lavage due to drainage blockage. In addition to solving this problem by introducing a two-lumen spiral drain into the omental sac (No. 7691 dated 13.10.2023), this problem was also solved using

omentobursocopy, which is also patented and proposed by us, which allows for controlled manipulations in the omental sac.

The method of ometobursostomy is carried out as follows: through the omentobursosoma (10) created earlier during surgical treatment of pancreatic necrosis, a camera is inserted, consisting of a long flexible wire (1) covered with an insulating material resistant to moisture, inside which the wires pass. At the proximal end of the videoscope there is a USB adapter (2) with two attachments micro-USB (3), USB Type-C (4), 10 cm from the adapter there is a backlight module (5) for turning it on and off, as well as a wheel for adjusting the brightness by moving the wheel for adjusting the brightness (6). At the distal end of the videoscope, an optical system (8) with 6 LEDs (9) is attached using a metal cylinder (7); the omental bursa (11) and pancreas are examined; the method also allows visualization of freely lying sequesters and washing of the omental bursa (12) under camera control; if necessary, drainage can be installed under videoscope control for subsequent fractional washing of the cavity; washing is performed until the washing water is clean.

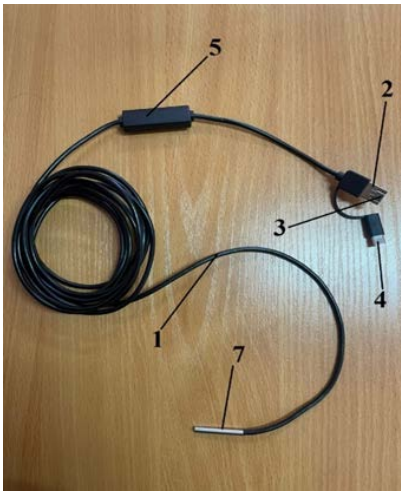

Figure 8. *General view of the endoscope.*

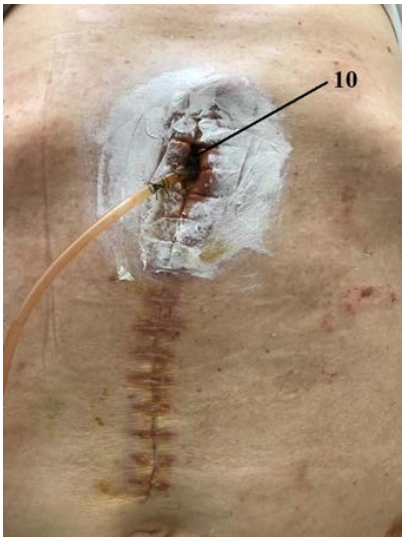

Figure 9. *Omentobursostoma.*

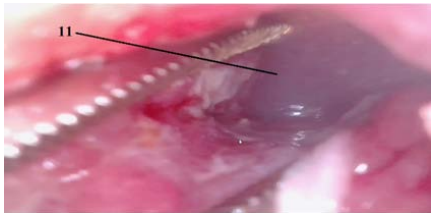

Figure 10. *The device is inserted into.*

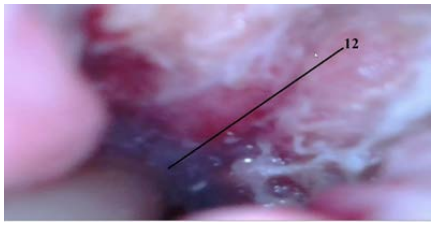

Figure 11. *Omentobursostoma after washing.*

Thus, the method of omentobursocopy allows for controlled manipulations in the omental sac, which creates conditions for more efficient and safe work of the surgeon in the treatment of pancreatic necrosis (Figures 8-11).

A Eurasian patent for the "Method of omentobursoscopy" No. 047489 was obtained on June 26, 2024.

Complications after surgical treatment of biliary pancreatitis occurred in 17.9% (n=7) of patients, including bile leakage at the site of the common bile duct drainage placement 2.6% (n=1), biliodigestive anastomosis insufficiency 2.6% (n=1), scar narrowing of the terminal part of the common bile duct after drainage 5.1% (n=2), increased severity of acute pancreatitis 5.1% (n=2) after endoscopic lithotripsy, fluid accumulation in the subcutaneous tissue (seroma) 5.1% (n=2).

There were 5.1% (n=2) deaths. The causes of death were recurrent erosive bleeding with total pancreonecrosis and septic shock with the development of multi-organ dysfunction.

Discussion.

This study was conducted in one medical institution, the University Hospital of the NCJSC "SMU" in the Department of Adult Surgery in Semey. In our study, we studied the surgical treatment of moderate and severe biliary pancreatitis. Among all surgical interventions, the most frequently performed were cholecystectomy with drainage of the common bile duct (CBD) 43.5% (n = 17), choledochoduodenoanastomy (CDD) according to the Yurash-Vinogradov method was performed in 18% (n = 7), hepaticojejunostomy according to Roux-en-Y in 7.7% (n = 3), laparotomy with dissection of the pancreatic capsule with abdominization - in 7.7% (n = 3). The developed method was used in 5.1% (n=2) of cases when acute biliary pancreatitis was complicated by infected pancreatic necrosis, and there was a need for urgent necrectomy, sanation of the omental bursa and parapancreatic tissue - laparotomy with cholecystectomy + drainage of the common bile duct with omentobursostomy and retroperitoneostomy were performed. Endoscopic interventions were used in 18% (n=7) of cases.

Management of patients with acute biliary pancreatitis is based on the principles of treatment of acute pancreatitis and

includes intensive therapy in the early stages, surgical treatment according to indications for sterile pancreatic necrosis, as well as staged interventions: percutaneous and endoscopic drainage with, if necessary, endoscopic or surgical (minimally invasive and classical open) necrsequestrectomy for infected pancreatic necrosis. Currently, numerous studies have confirmed the effectiveness and safety of early cholecystectomy for mild ABP. However, the issue of optimization of surgical tactics for moderate and severe ABP requires further serious study [5].

In complicated cases of acute biliary pancreatitis, when there was a need for a single-stage surgical intervention on the gallbladder, bile ducts, pancreas and retroperitoneal space, the "Universal Wound Retractor" developed by us was used.

In the study, a universal retractor was used in n=12 (30.7%) patients, conversion from minilaparotomy access was 4 (10.2%) patients. The average duration of the operation was 80 min.

In patients who underwent open surgeries, a spiral double-lumen drainage developed by us was installed. This double-lumen spiral drainage was installed in n=5 (12.8%) patients who underwent laparotomy with cholecystectomy + drainage of the common bile duct + omentobursostomy + drainage of the omental bursa and laparotomy with dissection of the pancreatic capsule with abdominization. There were no complications in the postoperative period in these patients.

What is drainage in their meta-analysis, the authors Zhang W, He S, Cheng Y, Xia J, Lai M, Cheng N, Liu Z described the results of the analysis of 6 studies and showed that routine drainage in pancreatic surgery reduces postoperative mortality [6].

The main disadvantages of the "closed" method are inadequate drainage, obstruction of drains by sequesters, detritus, formation of small and large intestinal fistulas, lack of visual control of the dynamics of pancreatic necrosis, relapse and occurrence of new foci of necrosis. The "open" drainage method is used for common infected forms of pancreatic necrosis, provides adequate access by forming a drainage channel for staged sanitation and sequestrectomy [7].

Currently, the use of open methods of treating complicated forms of acute pancreatitis has not lost its relevance. Despite the introduction of a new "step-up" approach, consisting in the step-by-step use of surgical methods from minimally invasive methods of drainage of the omental bursa to laparoscopic necrectomy, there are cases when surgical intervention by laparotomic access with drainage of the abdominal cavity and retroperitoneal space and the formation of an omentobursostomy is required. The omentobursostomy and retroperitoneostomy method for pancreatic necrosis proposed by us was performed in n = 2 (5.1%) patients taking into account the presence of an infiltrate with multiple foci of hemorrhage in the parapancreatic tissue, as well as the paranephric, paracolic and retroperitoneal space and foci of steatonecrosis. All patients were discharged in a satisfactory condition.

The current level of surgical pancreatology indicates that, despite the emergence of new and improvement of proven methods for diagnosing acute pancreatitis, the use of a powerful arsenal of modern intensive care tools and the successes achieved in surgical methods for treating pancreatic necrosis, postoperative mortality in severe acute pancreatitis remains high and reaches 80% in infected pancreatic necrosis [8].

In patients with large-focal, subtotal-total pancreatic necrosis, which in most cases are accompanied by widespread enzymatic phlegmon of the parapancreatic and retroperitoneal tissue, there is always a high probability of infection of necrotic foci with subsequent formation of pancreatogenic abscesses, purulent-necrotic phlegmons, requiring an individualized approach to the choice of access and the method of their drainage [9].

Indications for laparotomy in infected pancreatic necrosis are compartment syndrome, widespread purulent peritonitis, and extensive infected parapancreatitis. The use of combined (minimally invasive and traditional) surgical interventions in infected pancreatic necrosis leads to a significant reduction in postoperative mortality and the duration of hospital treatment [10].

A common problem of postoperative administration of patients with pancreatic necrosis is poor active lavage due to drainage blockage. In addition to solving this problem by introducing a double-lumen spiral drainage into the omental bursa, we propose solving this problem using omentobursoscopy, also patented and proposed by us, which allows for controlled manipulations in the omental bursa.

Analogues of the proposed method of omentobursoscopy are the sanitation of purulent-necrotic foci of the abdominal cavity and retroperitoneal space in acute destructive pancreatitis, a method described by a group of authors Onopriyev A.V., Rogal M.L., Gladkiy E.Yu. et al., the essence of the method is as follows: an endoscope is inserted into the patient and he is laid on his stomach. A fistula opening is found along the posterior wall of the stomach or in the area of the posterior wall of the DNK. A gastroscope is inserted into the fistula opening, under visual and radiographic control. The endoscope is inserted into the purulent-necrotic cavity and its sanitation is carried out by washing it with antiseptic solutions [11]. The disadvantages of this method are the obligatory presence of a fistula between the stomach and the retroperitoneal space, the long, thin transnasal drainage installed along the working channel of the gastroscope does not provide adequate outflow of exudate and removal of sequesters.

There is also an analogue of the method described by Carter, C.R. Percutaneous necrosectomy and sinus tract endoscopy in the management of infected pancreatic necrosis: an initial experience. In this method, access is made under CT control through the gastrocolic ligament or between the lower pole of the spleen and the splenic flexure of the colon, an 8 Fr drainage with a "pig tail" design is inserted into the cavity, then the patient's channel is bougienaged to 30 Fr in the operating room. Using a nephroscope, using an intermittent irrigation and suction mode, freely lying sections of sequesters are removed, hard and tightly fixed sections are separated using soft clamp or forceps through the working channel by repeatedly inserting the instrument into the cavity [12]. The disadvantages of this method are the absence of formed wound channels, which increases the risk of leakage of exudate and lavage fluid into the free abdominal cavity; removal of fixed sequesters without the use of instrumental visualization methods increases the risk of intraoperative complications; alternating insertion of

a nephroscope and a working instrument prolongs the time of surgical intervention and complicates technical execution.

The relevance of the problem is due to the lack of a well-founded tactic for managing biliary pancreatitis, especially moderate and severe, accompanied by destruction of the gallbladder, choledocholithiasis, mechanical jaundice, cholangitis, necrotic accumulations of the pancreas, pancreatic necrosis without a tendency to delimitation.

Therefore, the problem of successful treatment of this disease is a priority area of scientific research in many clinics that provide emergency surgical care.

Conclusion.

Thus, complications after surgical treatment of biliary pancreatitis occurred in 17.9% (n=7) of patients, including bile leakage at the site of the common bile duct drainage placement 2.6% (n=1), biliodigestive anastomosis insufficiency 2.6% (n=1), scar narrowing of the terminal part of the common bile duct after drainage 5.1% (n=2), post-manipulation acute pancreatitis 2.6% (n=1), pancreonecrosis 2.6% (n=1), fluid accumulation in the subcutaneous tissue (seroma) 5.1% (n=2). There were 5.1% (n=2) deaths.

In complicated cases of acute biliary pancreatitis, when there was a need for simultaneous surgical intervention on the gallbladder, bile ducts, pancreas and retroperitoneal space, we used a universal early expander (EAPO No. 038346 dated August 12, 2021) developed by us, the retractor allows for better visualization of the surgical field and significantly facilitates the surgeon's work during the performance of the surgical procedure, and the two-lumen spiral drain (No. 7691 dated October 13, 2023) provides adequate drainage and flushing, as well as irrigation with medications to prevent further destruction of the pancreatic parenchyma and the development of purulent-septic complications, and as an addition to improving the treatment of acute pancreatitis, we also used the omentobursoscopy method (No. 36736 dated August 2, 2024) in the postoperative period, which allows for controlled manipulations in the omental sac, which creates conditions for more high-quality and safe work of the surgeon in the treatment of pancreonecrosis.

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