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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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No 6 (363) 2025

Содержание:

N. Nachkebia, Kh. Bezhanishvili, N. Maglakelidze, N. Rogava, E. Chkhartishvili, M. Babilodze, M. Shavgulidze, N. Pipia, O. Mchedlidze, V. Tsomaia, I. Khachidze, E. Chijavadze.
INCIDENCE AND CHARACTER OF SUBJECTIVE SLEEP DISORDERS IN THE GEORGIAN POPULATION OF CHILDREN AND ADOLESCENTS WITH AUTISM SPECTRUM DISORDER (ASD)…….....…….6-11

Vu Nguyen, Tan Minh Hoang.
SPINAL CANAL SIZE IMPROVEMENT AFTER XLIF FOR LUMBAR SPINAL STENOSIS…….....……12-17

Bi-Yun Sun, Wei Peng.
APPLICATION OF SHELL TECHNIQUE IN C-TIRADS COMBINED WITH STE IN DIAGNOSIS OF C-TIRADS GRADE 4-5 NODULES…….....……18-22

Talgar Abilov, Irina Ismailova, Zhangeldy Shaimbetov, Nauryzbay Imanbayev, Yerbolat Iztleuov.
IMPACT OF VITAMIN D METABOLISM DISORDERS ON THE DEVELOPMENT OF AUTOIMMUNE KIDNEY DISEASES: A SYSTEMATICREVIEW…….....……23-30

Abdullayev Anar Sardar.
COMPARISON OF AGE-RELATED CHARACTERISTICS OF CEPHALOMETRIC INDICATORS: BIORBITAL BREADTH (EC–EC) AND INTERORBITAL BREADTH (D–D) IN ARTIFICIALLY DEFORMED AND NORMAL SKULLS……...……31-36

Olena Babkina, Svitlana Danylchenko, Ihor Korobko, Oleksandr Yanchevskyi, Artem Kravchenko.
FEATURES OF DIAGNOSTICS OF FATAL KIDNEY INJURY IN MEDICAL PRACTICE…….....……37-45

Uday Mahajan, MERAJ AKHTAR, Arnab Sain, Ariz Raza, Mohammad Yousaf, Asif Afridi, Bilal Ahmad, Mohamed Kabary, Ahmed Sham Nasir, Musab Mohamed, Hoosai Manyar, Holly Hathaway, Vivek Deshmukh.
INTRA-OPERATIVE ASSESSMENT OF TIBIAL PLATEAU FRACTURE REDUCTION IN LOW-RESOURCE SETTINGS……..…46-48

Ardiana Dragobuzhda Ismaili, Adelina Ismaili Murati.
THE ASSOCIATION BETWEEN QUALITY OF TEACHING AND STUDENT'S SUCCESS AT THE FACULTY OF MEDICINE IN KOSOVO…….....……49-53

Yurevych N, Pokotylo P, Podoliuk M, Seleznova R, Voinytska O, Vdovichenko V, Sukhonosov R, Alekseeva V.
ANATOMICAL VARIABILITY OF THE ETHMOID AND SPHENOID SINUSES…….....……54-58

Premtim Rashiti, Bujar Shabani, Jeton Shatri, Leotrim Berisha, Ardita Kafexholli, Dijon Musliu.
TYPE A INTERCONDYLAR FOSSA CONFIGURATION SIGNIFICANTLY INCREASES ACL RUPTURE RISK: A MORPHOMETRIC MRI STUDY…….....……59-64

Amrit Goyal, Vivek Mittal, K.S. Dinkar, Mayur Gupta, Amit Agarwal, Hari Singh.
FEMOROACETABULAR IMPINGEMENT: PREVALENCE OF RADIOGRAPHIC MORPHOLOGY IN INDIAN POPULATION, ETIOLOGY AND CLINICAL MANAGEMENT…….....……65-75

Nino Totadze.
THE IMPORTANCE OF PROMOTING BREASTFEEDING-MATERNAL NUTRITION DURING LACTATION……..……76-83

Asmaa Yousuf Thanoon Al-Nuaimy, Faehaa Azher Al-Mashhadane.
THE IMPACT OF HYALURONIC ACID ON GINGIVITIS AND PERIODONTAL HEALTH…….....…….84-88

Gulnara Svyatova, Galina Berezina, Alexandra Murtazaliyeva, Yergali Miyerbekov, Ualikhan Imammyrzayev.
GENETIC ASPECTS OF WARFARIN DOSING ALGORITHMS IN CARDIAC SURGERY PATIENTS WHO HAVE UNDERGONE HEART SURGERY: SYSTEMATIC REVIEW…….....……89-104

Dauren Zhumatayev, Abylai Baimakhanov, Aidar Raimkhanov, Danyiar Toksanbayev, Alibek Smagulov, Giedrius Barauskas, Nazarbek Omarov.
ONE-STEP TACTICS OF SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS IN COMBINATION WITH CHOLEDOCHOLITHIASIS…….....……105-111

Manana Machitidze, Nato Durglishvili, Maia Gogashvili, Vazha Nebieridze, Jaana Sepp.
EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS TO DEVELOP PATIENT SAFETY KNOWLEDGE, SKILLS, BEHAVIORS, AND ATTITUDES IN NURSING STUDENTS – INTERNATIONAL STUDY…….....……..…112-117

Zahraa Alkhafaje, Ahmed Mohamed Kmkm, Rawnaq Jamal Madhloom, Nuha Mohammed Abdulkhaleq, Doaa Mohsin Farhan, Sura Sagban Abid Ali, Hany Akeel Al-hussaniy, Abdul-Salam Harfash, Abdulwahhab Hameed Rashid, Usama S. Altimari.
CORRELATION OF FETAL MEASUREMENTS WITH GESTATIONAL AGE IN 144 ABORTED FETUSES: A CROSS-SECTIONAL HOSPITAL-BASED OBSERVATIONAL STUDY…….....……..118-124

Tchernev G, Broshtilova V, Tchernev KG Jr, Krastev DS, Krastev NS, Kordeva S.
POSTTRAUMATIC SUBUNGUAL ACRAL NODULAR MELANOMA WITH BONE INFILTRATION TREATED VIA AMPUTATION OF THE DISTAL AND MIDDLE PHALANX: DESCRIPTION OF A CASE AND UPDATE ON THE TOPIC…….....…….125-130

Madina Khalmirzaeva, Almagul Kurmanova, Damilya Salimbayeva, Gulfairuz Urazbayeva, Gaukhar Kurmanova, Zhanar Kypshakbayeva, Gaukhar Koshkimbayeva.
MOLECULAR MECHANISMS OF OBSTETRIC APS…….....……131-144

Huseynov Fuad Rafig Ogli.
COMPARISON QUALITY OF LIFE BETWEEN THORACOSCOPIC SURGERY AND TRADITIONAL SURGERY IN THE TREATMENT OF CONGENITAL DIPHRAGMAL HERNIA IN NEWBORNS…….....……145-149

Diyas Myrzakozha, Tolkyn Issabekova, Nurgali Rakhymbayev, Elmira Karlova, Elena Nechepurenko.
COMPARATIVE STUDY OF ANTIBACTERIAL EFFECTS OF MODIFIED PREPARATIONS CONTAINING METAL NANOPARTICLES…….....……150-157

Chekhovska G.S, Pustova N.O, Chaplyk-Chyzho I.O, Kachailo I.A, Sypalo A.O, Gradil G.I, Lytvynenko M.V, Lobashova K.G, Piriatinska N.E, Kudriavtseva T.O, Gargin V.V.
CONCEPTUAL AND THEORETICAL EXPLORATION OF TREATMENT OF PATIENTS WITH ONYCHOMYCOSIS…….……158-166

Yesset Muratov, Ruslan Irmekbayev, Yerbolat Iztleuov, Nauryzbay Imanbayev, Nurgul Kereyeva, Maiya Taushanova.
TOXIC EFFECTS OF CHEMOTHERAPY ON THE VISUAL ORGAN IN MALIGNANT NEOPLASMS: A SYSTEMATIC REVIEW…….....167-174

Niyazi Burhan Aldin Mohammad, Omeed Darweesh, Marwan M. Merkhan.
THE IMPACT OF DISEASE-MODIFYING MEDICATIONS ON THE LIPID PROFILE OF PATIENTS WITH ISCHEMIC HEART DISEASE…….....……..…175-178

Arta Veseli, Dashnor Alidema, Kaltrina Veseli, Edona Breznica, Enis Veseli, Denis Behluli, Argjira Veseli, Agon Hoti.
THE IMPACT OF SYSTEMIC DRUGS ON THE ORAL AND GUT MICROBIOME: A NARRATIVE REVIEW……...……179-183

Altynay Dosbayeva, Askar Serikbayev, Alua Sharapiyeva, Kuralay Amrenova, Ainur Krykpayeva, Ynkar Kairkhanova, Altay Dyussupov, Assanali Seitkabylov, Zhanar Zhumanbayeva.
POST-COVID-19 SYNDROME: INCIDENCE, BIOMARKERS, AND CLINICAL PATTERNS IN KAZAKHSTAN……..……184-192

Aisha Ibrayeva, Botagoz Turdaliyeva, Gulshara Aimbetova, Darina Menlayakova, Dalal Gizat, Alfiya Shamsutdinova, Ildar Fakhradiyev.
POST-TRAUMATIC STRESS DISORDER AMONG EMERGENCY RESPONDERS AND VICTIMS OF DISASTERS IN KAZAKHSTAN: PREVALENCE, RISK FACTORS, AND REHABILITATION NEEDS…….....…193-197

Samal Myktybayeva, Kuralbay Kurakbayev, Zhanar Buribayeva, Madamin Karataev, Aizhan Turekhanova, Zhanar Kypshakbayeva, Madina Khalmirzaeva.
REPRODUCTIVE HEALTH OF WOMEN IN PENITENTIARY INSTITUTIONS: A CASE STUDY IN KAZAKHSTAN…..……198-204

Adil Khalaf Altwairgi, Faisal Awadh Al-Harbi, Abdullah S. Alayed, Albaraa Nasser Almoshigeh, Emad Khalid Aloadah, Raghad Alkhalifah, Badr Alharbi.
KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARD PROSTATE CANCER AND ITS SCREENING METHODS IN QASSIM REGION…….....……205-211

Olena Haidai, Inha Samborska, Oleksandr Maievskyi.
FEATURES OF THE EFFECT OF SCORPION VENOM ON THE IMMUNE DEFENSE SYSTEM OF THE MAMMALIAN LIVER (REVIEW)…….....……212-220

GEORGIAN MEDICAL NEWS
No 6 (363) 2025

ONE-STEP TACTICS OF SURGICAL TREATMENT OF ACUTE CHOLECYSTITIS IN COMBINATION WITH CHOLEDOCHOLITHIASIS

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Abstract.

Introduction: Concrements of the common bile duct (choledocholithiasis) occur from 8% to 20% in patients with acute cholecystitis. This pathology requires simultaneous correction of the pathology of the gallbladder and the common bile duct.

Methods: We retrospectively analyzed the case histories of 135 patients who underwent endoscopic retrograde cholangiopancreatography, endoscopic papillosphincterotomy, choledocholithoextraction followed by laparoscopic cholecystectomy + CHEST + LCE) for acute cholecystitis in combination with choledocholithiasis in the period from January 2016 to March 2021. Patients who underwent simultaneous treatment (ERCP + EPST + CLE + LCE under one anesthesia) were assigned to the OS group (n = 63), patients who underwent two-stage treatment (ERCP + EPST + CLE and LCE on the 3-4th day during one hospitalization) were assigned to the TS group (n = 72). All endoscopic procedures in both groups were performed by the same endoscopist using the same technique.

Result: There were significant differences between the groups in terms of the duration of anesthesia, the dynamics of the decrease in the blood serum of the total bilirubin and the leukocytes range at the postoperative period, the frequency of postoperative complications and the duration of the average hospitalization in favor of one-stage treatment.

Conclusions: One-time treatment tactic is safe and optimal for the treatment of acute cholecystitis combined with choledocholithiasis, characterized by a short hospital stay, a low rate of episodes of acute cholecystitis and recholedocholithiasis, which often occur with two-stage (TS) treatment tactics.

Key words. Diagnostics, endoscopic procedures, acute cholecystitis, choledocholithiasis, surgical treatment.

Introduction.

Common bile duct calculi (CBD) occur in patients with acute cholecystitis with a frequency of 8% to 20% [1,2]. Despite the fact that the problem of acute cholecystitis in combination with choledocholithiasis is being studied by many foreign researchers, until now there is no evidence regarding a safe time interval between endoscopic and laparoscopic interventions. According to Allen N. et al., if after resolution of choledocholithiasis radical cholecystectomy is not performed, then the frequency of subsequent complications of cholelithiasis varies from 11 to 47% [3]. Reinders et al. also emphasize that delayed cholecystectomy after bile duct clearance significantly increases the risk of recurrent biliary events, including cholangitis, pancreatitis, and recurrent choledocholithiasis, thereby advocating for timely surgical management.

Given these findings, it becomes evident that a two-stage or delayed approach can result in considerable morbidity. Therefore, this pathology requires a comprehensive surgical solution that addresses both the gallbladder (the source of stones) and the common bile duct (the site of obstruction and potential infection). Simultaneous or closely staged management—typically via endoscopic retrograde cholangiopancreatography (ERCP) for bile duct clearance followed by laparoscopic cholecystectomy—is increasingly recognized as the optimal strategy to reduce complications and improve outcomes.

Considering the widespread use of cholelithiasis and its complications with choledocholithiasis, an increase in the number of surgical interventions, as well as the widespread introduction of new technologies, the urgency of further study and optimization of treatment tactics and determination of the effectiveness of modern minimally invasive operations is obvious. With prolonged course of intraductal biliary hypertension caused by concretions of the CBD, the risk of developing cholangitis is extremely high. This circumstance, in turn, can lead to a rapid deterioration in the patient's condition, and death can occur in a short time. Timely surgical intervention aimed at both the source (gallbladder) and the effect (CBD obstruction) is therefore critical for patient survival and recovery [4].

Optimizing the costs of the healthcare system in our country is one of the most pressing problems. One effective method of reducing costs is to reduce the length of a patient's hospital stay. Implementation of one-stage (OS) treatment tactics - endoscopic retrograde cholangiopancreatography, endoscopic papillosphincterotomy, choledocholitholithorectomy followed by laparoscopic cholecystectomy (ERCP + EPST + CLE + LCE) under one anesthesia can be one of the optimal methods for reducing the duration of choledochaemia and the frequency of recurrent inpatient treatment reducing costs for this category of patients. Several European studies have shown satisfactory results with one-stage ERCP + EPST + CLE + LCE compared with traditional two-stage (TS) treatment (ERCP + PEPT + CLE + LCE after 1-3 months) [5-7].

The aim of the current study was to compare the effectiveness of the use of a one-stage treatment method with a two-stage treatment for acute cholecystitis, combined with choledocholithiasis.

Materials and Methods.

The work is based on the analysis of the results of surgical treatment of 135 patients with acute cholecystitis in combination with choledocholithiasis, who were treated at the City Clinical Hospital No. 4 of the city of Almaty for the period from January 2016 to March 2021.

The study protocol was approved by the Ethics Commission of the NJSC "KazNMU named after S.D. Asfendiyarov" (protocol No. 13 of November 25, 2020). All patients gave informed voluntary consent for examination and treatment in accordance with the Declaration of Helsinki.

Inclusion criteria were age over 16 years, bile duct stones up to 15 mm in size, acute cholecystitis (without gallbladder perforation), no suspicion of the presence or confirmed malignant neoplasms of the pancreatobiliary zone and no contraindications for laparoscopic cholecystectomy, physical status of patients according to the classification of the American Society of Anesthesiologist (ASA) I, II, III.

Exclusion criteria were age up to 16 years, late pregnancy, gallbladder cancer, shriveled gallbladder, diffuse peritonitis, gallbladder perforation, ASA IV-V. Patients who failed to successfully complete ERCP + EPST were also excluded. The indications for ERCP + EPST were carefully assessed for each patient after consultation with the endoscopist, surgeon and anesthesiologist before the procedure, i.e. this category of patients requires a multidisciplinary approach to treatment. All patients were operated on urgently.

Depending on the tactics of surgical treatment, the patients were divided into 2 groups.Patients with one-stage treatment tactics under one anesthesia (ERCP + EPST + CLE + LCE) assigned to the OS group (n = 63) were treated in the period 2018-2021, since the one-stage treatment was introduced in January 2018. two-stage tactics (ERCP + EPST + CDE and LCE on the 3rd or 4th day) were assigned to the TS group (n = 73). They were treated between 2016-2017.

Table 1 presents data on the main general and clinical indicators of the surveyed when divided into groups.

Comparative analysis of the main group and the comparison group for the main clinical parameters did not reveal significant differences. The average age of patients in both groups was almost identical. When distributed by sex, there was a slightly higher relative number of men in the main group, with a general predominance of the number of women.

There were no significant differences in the number of cases of jaundice associated with obstruction of the biliary tract, the duration of the state of acute cholecystitis, the frequency of cholangitis.

In both groups, multiple calculus was more often observed, there were no significant differences in the frequency of such. The frequency of cholangitis was insignificantly higher in the study group.

The majority of patients in both groups were operated on for acute obstructive cholecystitis, acute phlegmonous cholecystitis was more frequent in the comparison group, but only in the main group there were cases of gangrenous cholecystitis (in 2 patients, 3.2%).

Thus, the surveyed groups were representative in all general and clinical characteristics. We believe that there was no significant effect of the revealed insignificant differences on treatment results.

The study process included comparison of laboratory parameters (total bilirubin level, alanine aminotransferase (ALT), aspartate aminotransferase (AST), amylase, leukocyte count in peripheral blood), duration of anesthesia, length of hospital stays. Early clinical outcomes and complications were determined.

Surgical tactics:

The one-stage tactics of treatment of acute cholecystitis, which we use, combined with choledocholithiasis, have recently been widely introduced into the surgical practice of medical institutions in many countries, and their results are described in detail in a number of scientific studies [8-11]. But in the Republic of Kazakhstan, the first application of this tactic began with us in 2018 [12].

With this technique, ERCP + EPST + CLE are the first stage of the intervention. In order to prevent post-cannulation pancreatitis, an hour before the operation, patients are injected

Table 1. *Differences between the study groups by age, sex, duration of obstructive jaundice, forms of acute destructive cholecystitis.*

Parameter	**One-stage surgery group (n = 63)**	**Two-stage surgery group (n = 72)**	**P-value**
Age, medium (min-max)	54.0 (23-88)	54.2 (26-84)	0.97
Sex (m/f)	19/44	17/55	0.25
Obstructive jaundice	48 (76.2%)	58 (80.6%)	0.30
Duration of jaundice (hour)	35.2±5.4	39.6±7.7	0.41
Duration of an attack of acute cholecystitis (hours)	49.6±11.2	46.0±13.0	0.57
Cholangitis	13 (20.6%)	7 (9.7%)	0.12
Number of calculi			
Single	26 (41.3%)	32 (44.4%)	0.27
Plural	37 (58.7%)	40 (55.6%)	
Calculus size (mm)	8.1±3.2	9.2±3.6	0.31
Clinical morphological form of acute cholecystitis			
Acute obstructive cholecystitis	48 (76.2%)	49 (68.1%)	0.45
Acute phlegmonous cholecystitis	13 (20.6%)	23 (31.9%)	
Acute gangrenous cholecystitis	2 (3.2%)	0	

with a non-steroidal anti-inflammatory drug. In the operating room after preoperative preparation under total intravenous anesthesia with artificial ventilation of the lungs, the patient in the prone position under the control of an electronic optical device (Siemens Siremobil Compact L) is performed ERCP + EPST (Pentax ED-3490TK), CLE using the Dormia basket. Intubation of the duodenoscope is performed in the descending part of the duodenum (Duodenum). The papillotome is inserted retrogradely into the large duodenal nipple (BDS). Further, with the help of a conductor, the catheterization of the common bile duct is assessed, after which the contrasting of the common bile duct and the detection of calculi are performed, then papillosphincterotomy is performed with the help of the papillotome, the middle of the cutting string is set at the BDS at 11-13 hours of its circumference. By pulling the handle, the cutting part approaches the anteroposterior wall of the BDS. Papillotomy is performed by a series of short current flows in a mixed mode of coagulation and cutting or only cutting, gradually removing the papillotome. Next, litho extraction is performed with the Dormia basket. After that, a revision of the bile ducts is performed with a Dormia basket or a balloon extractor. Upon completion, control contrasting of the biliary tract is carried out. In the absence of calculi, the contrast agent is aspirated and the bile ducts are flushed with warm saline. At the end of the procedure, air is aspirated from the upper gastrointestinal tract, then a nasogastroduodenal probe is installed to evacuate air and to prevent iatrogenic damage to the intestine. To perform the second stage, the patient's position is changed by turning onto his back. After the processing of the operating field, working trocars are installed at typical points of the Calca and LCE is performed.

With TS treatment tactics, the techniques of ERCP + EPST and LCE remain identical as with OS tactics, however, there is a time interval of 48-72 hours between ERCP + EPST and LCE.

Statistical analysis:

According to generally accepted statistical According to the technique, the data array obtained during the examination of patients was processed on a personal computer using the statistical program GraphPad Prism 8 (GraphPad Software, San Diego, California, USA) using the methods of parametric and nonparametric statistics. All continuous variables were presented as mean ± standard deviation. All categorical variables were presented as frequencies (percentage). Student's t-test was used to test the statistical significance of differences in measured variables between the two groups. When determining the criteria that exclude the use of parametric methods (absence of equality of variances and normal distribution), the Mann-Whitney test was used. To determine the significance of differences in qualitative data between the two study groups, a two-sided Fisher's exact test was used. To refute the null hypothesis, the level of differences had to exceed $p < 0.05$.

Results.

Analysis of the results of surgical treatment revealed a limited number of differences between the OS and TS intervention groups, but they play a significant role in the clinical characteristics of the postoperative course.

Analyzing laboratory parameters, data were obtained presented in table 2.

It should be noted that the studied indicators of the functional state of the liver did not differ significantly between the groups. Before surgical treatment, a sharp increase in the level of bilirubin in the blood was recorded in comparison with the normative indicators, which was determined by obstruction of the biliary tract. After surgery, a rapid decrease in this indicator was determined; in the group with a single-stage intervention during the study period, it was slightly lower than in the comparison group, but the differences were not statistically significant.

Similar conclusions should be drawn regarding the activity of the studied enzymes. There were no differences in ALT, AST and amylase activity indicators, reflecting the degree of damage to the liver and pancreas tissues.

The total leukocyte count was insignificantly higher than that of the two-stage intervention group in the one-stage group.

Table 2. *Indicators of laboratory examination in dynamics.*

Parameters	**One-stage surgery group (n = 63)**	**Two-stage surgery group (n = 72)**	**P**
Total bilirubin ($\mu M*l^{-1}$):			
- on admission	86.2±8.8	98.7±10.9	>0.05
- after surgery	24.2±6.5	31.8±7.7	>0.05
ALT (U/l):			
- on admission	225.5±63.4	203.0±61.0	>0.05
- after surgery	85.5±17.0	87.6±18.6	>0.05
AST (U/l):			
- on admission	173.0±48.4	157.8±41.3	>0.05
- after surgery	50.4±19.4	53.2±17.0	>0.05
Amylase (U/l):			
- on admission	164.2±51.3	144.3±56.1	>0.05
- after surgery	56.6±14.3	58.9±11.7	>0.05
Leukocytes ($10^{9}*l^{-1}$):			
- on admission	13.1±3.2	12.0±2.8	>0.05
- after surgery (3rd day)	10.8±2.0	12.1±2.5	>0.05
- after surgery (5th day)	8.9±1.1	10.2±1.7	>0.05

Table 3. *Early postoperative complications in the study groups.*

Parameters	One-stage surgery group (n = 63)		Two-stage surgery group (n = 72)		P
	n	%	n	%	
Complications of endoscopic retrograde cholangiopancreatography					
Reholedocholithiasis	0	0	7	9.7	0.011
Acute pancreatitis	7	11.1	15	20.8	0.124
Bleeding in the area of the greater duodenal papilla	2	3.2	2	2.8	0.661
Total	9	14.3	24	33.3	0.009
Laparoscopic Cholecystectomy					
Cystic artery stump bleeding	2	3.2	3	4.2	0.573
Bile leakage	1	1.6	2	2.8	0.550
Suppuration of a postoperative wound	0	0	3	4.2	0.149
Bleeding from the gallbladder bed	1	1.6	2	2.8	0.550
Total	4	6.4	10	13.9	0.128
Grand total	13	20.6	34	47.2	0.001

During the examination 5 days after the operation, the opposite state was observed - the indicator was lower in the group of one-stage operation. The degree of reduction in the first case was 32.2%, in the second 14.8% (p = 0.037).

Table 3 presents an analysis of the frequency of early complications of surgical interventions.

The most significant complications of interventions performed on the common bile duct were recurrent choledocholithiasis, acute pancreatitis and bleeding from the area of the greater duodenal papilla. At the same time, despite the fundamental identity of the performed surgical interventions, there were no cases of recurrent choledocholithiasis in the group of one-stage treatment, while there were 7 (9.7%) in the group of two-stage intervention. The differences turned out to be statistically significant.

The incidence of acute pancreatitis as a result of the intervention was almost twice as high in the two-stage intervention group, although the differences were not significant.

Overall, the number of complications associated with choledochus interventions in the OS surgical treatment group was 14.3%, and TS was 33.3% (p = 0.009).

Complications associated with the stage of cholecystectomy did not differ in frequency between the groups, although there were tendencies towards a decrease in the frequency of complications with the single-stage variant of the intervention. As a result, the overall incidence of complications recorded during the follow-up period with OS intervention was 2.3 times lower than with TS.

An analysis of the total duration of anesthesia during interventions was also performed (Figure 1).

The total duration of the anesthesia period taking into account the second stage of intervention in the TS group was 145.6 ± 17.2 minutes versus 133.0 ± 14.5 minutes in the OS group (the differences are insignificant.

Figure 2 shows the data on the duration of hospitalization depending on the group of the examined.

Duration of inpatient treatment in patients of the OS group ranged from 4 to 11 days, TS group - from 9 to 16 days. The average values were 7.3 ± 1.5 and 11.9 ± 1.3 (p = 0.030).

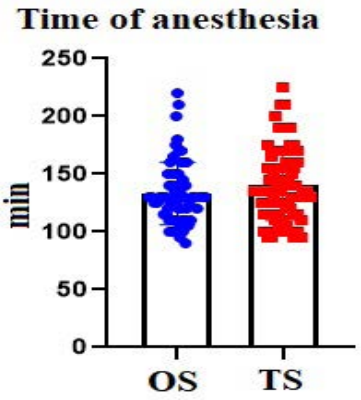

Figure 1. *An analysis of the total duration of anesthesia during interventions was also performed.*

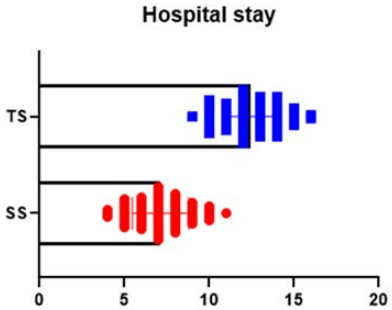

Figure 2. *The data on the duration of hospitalization depending on the group of the examined.*

Discussion.

According to some authors, ERCP + EPST + CLE + LCE under one anesthesia is the best approach in this category of patients, since from diagnostic ERCP it is possible to switch to therapeutic measures when calculi are detected and to eliminate the block in the common bile duct with minimal aggression on the patient's body [13]. Friis et al. (2007) in their recent systematic

review showed that early LCE after endoscopic choledocholite extraction significantly reduces mortality, the risk of recurrence of acute cholecystitis and the length of hospital stay compared with delayed LCE [14]. The authors concluded that, ideally, patients should be operated on within 24 hours after ERCP + EPST, or at least within the first few days. It should be noted that this study did not include patients with acute cholecystitis. In our study, we used the criterion of the effectiveness of one-step tactics (laboratory data, risk of recholedocholithiasis, length of hospital stay) in patients with acute cholecystitis in combination with choledocholithiasis. Terauchi et al. in 2006 analyzed the results of treatment of 119 patients with acute cholecystitis in combination with choledocholithiasis [15]. For 106 patients, OS was used, and 13 patients were treated with TS. Comparison of the two groups did not reveal significant differences in the time of surgery, the incidence of postoperative complications and bed-days.

Rabago et al. in 2006 reported success in the ERCP + EPST + LCE group in 96.6% of patients and in 90.2% in the LCE group + laparoscopic debridement of the common bile duct [16]. However, LCE with simultaneous laparoscopic elimination of choledocholithiasis is still not widely used, since this method requires a high level of technical training of the surgeon in terms of laparoscopic skills and special video endoscopic equipment [17]. If a medical institution does not meet the above requirements, then Vecchio and MacFadyen at 2002 recommend resorting to ERCP + EPST + CLE + LCE under one anesthesia, as a method that is not inferior in efficiency of laparoscopic sanitation of the common bile duct [18]. In our study, surgical treatment was performed by a highly specialized experienced surgeon and endoscopist. All operations were performed by the same specialists.

Optimal management of patients with acute cholecystitis in combination with choledocholithiasis largely depends on the professional level of medical personnel, multidisciplinary (radiologist, endoscopist, surgeon, anesthesiologist) and technical equipment of the medical institution [19]. In our practice, we did not experience difficulties in organizing the stages of OS tactics.

In the randomized trials of Muhammedoğlu and Kale, patients with acute cholecystitis in combination with choledocholithiasis were divided into 2 groups with the participation of 119 patients who received OS treatment tactics and TS tactics with delayed LCE [20]. The results of the study show that TS tactics have the greatest success in the treatment of acute cholecystitis in combination with choledocholithiasis, advantages in terms of the duration and cost of hospitalization, and a short duration of anesthesia. The biggest advantage of OS tactics is that the procedure is carried out in one stage in the same medical institution, there is no risk of repeated episodes of acute cholecystitis and recholedocholithiasis. Williams and Vellacot argue that the number of bed-days can be significantly reduced precisely by using ERCP + EPST + CHLE + LCE under one anesthesia [21]. In our study, the number of bed-days spent in the hospital in group A was significantly less than in group B. Jones et al. in their studies compared the effectiveness between OS and TS tactics based on the treatment of 20 patients [22]. As a result, there was a statistically significant difference between the methods in terms of costs ($p = 0.033$), although there were no statistically significant differences in terms of length of stay and complication. In our study, statistical differences were found in terms of anesthesia time, in the dynamics of a decrease in total bilirubin and blood leukocyte after surgery and the average hospital stay in favor of OS treatment tactics.

Enochsson et al. (2004) reported that in supine patients, cannulation of the common bile duct during ERCP may be more difficult [23]. For selective cannulation of the common bile duct, Pesce et al. in 2017 assessed the effectiveness of the so-called "rendez-vous" technology, in which a conductor was inserted antegradely into the duodenum, which, under the control of a duodenoscope, was removed through the mouth, papillotome was inserted into the BDS and papillosphincterotomy was performed [24]. Thanks to this technique, blind catheterization of the OBD is excluded and, as a result, a decrease in the number of complications is observed. This technique, in turn, is a routine procedure that requires good technical equipment and high professionalism and experience. In our practice, the success of cannulation and sanitation of the common bile duct was complete, and there were no cases of recholedocholithiasis in group A, since the gallbladder with calculi were removed immediately after ERCP + EPST under one anesthesia. Several foreign articles reported some technical difficulties during LCE after ERCP due to pneumatosis of the duodenum and proximal jejunum [23]. In our practice, at the end of the ERCP + EPST procedure, air is aspirated from the upper gastrointestinal tract, then a nasogastroduodenal probe is installed to evacuate air and to prevent iatrogenic damage during intestinal LCE [10].

Zang et al. in their studies evaluated the efficacy and safety of OS tactics in 91 patients and TS tactics in 65 patients [25]. The average duration of endoscopic interventions in the OS group was 34.9 minutes, in the TS group 35.3 minutes. At the same time, there were no statistically significant differences between the groups in the success of ERCP + EPST (97.8% for the OS group versus 98.5% for the TS group). The authors concluded that the simultaneous resolution of cholecystocholedocholithiasis can be performed under one anesthesia and is safe for patients. In our practice, the average time of ERCP + EPST + CLE was 51.3 ± 23.2 minutes in group A and 51.8 ± 21.9 minutes in group B, and 73.5 ± 20.5 minutes and 80.0 in group B. ± 25.9 min, respectively. As our observations have shown, the operating time largely depends on the state of the OBD, the size of the calculus. The larger the diameter of the calculus is the diameter of the common bile duct, the longer ERCP + EPST + CLE takes. Despite different factors, no significant statistical differences in the duration of ERCP + EPST + CLE and LCE were revealed in our work. It is impossible not to note the role of preventive maintenance of the so-called post-cannulation pancreatitis. The incidence of acute pancreatitis after ERCP + EPST ranges from 1 to 12% and develops within 24 hours after the endoscopic procedure [26]. For prophylactic purposes, we carry out complex conservative therapy, including drugs that inhibit the secretion of the pancreas, inhibitors of proetasis and non-steroidal anti-inflammatory drugs. A number of foreign sources provide tactics for preventing acute pancreatitis, such as selective

conjuration of the common bile duct, dosed administration of contrast agents and only in diluted form, followed by complete aspiration [27].

An equally important point during ERCP + EPST is the position of the patient on the operating table. In our practice, for optimal and safe cannulation of the common bile duct, we use the prone position [12]. This position facilitates selective cannulation of the common bile duct, provides a convenient image of the biliary tree and prevents aspiration of gastric contents into the airways.

In most medical institutions, the tactics of managing patients with acute cholecystitis combined with choledocholithiasis is more selective, which in turn is not allows to carry out comparative analysis among different methods on a large number of patients. It is necessary to further accumulate experience and improve these techniques, assess the immediate and distant results, which will allow more effective treatment of patients with acute cholecystitis in combination with choledocholithiasis using minimally invasive and endovideosurgical methods.

There are some limitations in our work. in the form of an individual character in relation to patients and a short period of observation of patients after surgery. According to generally accepted standards, reliable reasoning of long-term results will take at least 5-10 years or more.

Also, the OS and TS groups were treated in different time intervals (2016–2017 and 2018–2021), which may introduce potential changes such as differences in hospital logistics, diagnostic algorithms, surgical equipment, and the overall evolution of medical care. These factors cannot be completely excluded and should be taken into account when significant results are observed.

In addition, our study was conducted at a single center, which may limit the generalizability of the findings. Therefore, there is a clear need for further multicenter, prospective investigations to validate our results, assess long-term outcomes, and develop unified treatment protocols for patients with acute cholecystitis combined with choledocholithiasis.

Conclusion.

Our study shows that both approaches to the treatment of acute cholecystitis combined with choledocholithiasis meet all the requirements of modern surgery. Each method has its own indications and contraindications. However, the most preferable for this category of patients seems to be the OM tactics, the use of which allows to obtain quite satisfactory results. Simultaneous resolution of acute cholecystitis in combination with choledocholithiasis is accompanied by a decrease in moral and psychological trauma to the patient, material and economic costs by reducing postoperative complications (reholedocholiasis) and the patient's stay in a medical institution, the introduction of lower doses of drugs (one anesthesia instead of two), makes it possible early rehabilitation of patients, reduction of the period of incapacity for work of the population.

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REFERENCES

1. Zhu H.Y, Xu M, Shen H.J, et al. A meta-analysis of singlestage versus two-stage management for concomitant gallstones and common bile duct stones. Clinics Research Hepatology and Gastroenterology. 2015;39:584-593.

2. Chapuis-Roux E, Berthou J.C, Pellissier L, et al. How can recovery be enhanced after single-stage laparoscopic management of CBD stones? Endoscopic treatment versus laparoscopic surgery. Digestive and Liver Disease. 2017;49:773-779.

3. Allen N, Leeth R, Finan K, et al. Outcomes of Cholecystectomy After Endoscopic Sphincterotomy for Choledocholithiasis. Journal of Gastrointestinal Surgery. 2006;10:292-296.

4. Reinders J.S.K, Goud A, Timmer R, et al. Early Laparoscopic Cholecystectomy Improves Outcomes After Endoscopic Sphincterotomy for Choledochocystolithiasis. Gastroenterology. 2010;138:2315-2320.

5. Liverani A, Muroni M, Santi F, et al. One-step laparoscopic and endoscopic treatment of gallbladder and common bile duct stones: our experience of the last 9 years in a retrospective study. The American Surgeon. 2013;79:1243-1247.

6. Saccomani G, Durante V, Magnolia M.R, et al. Combined endoscopic treatment for cholelithiasis associated with choledocholithiasis. Surgical Endoscopy. 2005;19:910-914.

7. Rábago L, Vicente C, Soler F, et al. Two-stage treatment with preoperative endoscopic retrograde cholangiopancreatography (ERCP) compared with single-stage treatment with intraoperative ERCP for patients with symptomatic cholelithiasis with possible choledocholithiasis. Endoscopy. 2006;38:779-786.

8. Lyu Y, Cheng Y, Li T, et al. Laparoscopic common bile duct exploration plus cholecystectomy versus endoscopic retrograde cholangiopancreatography plus laparoscopic cholecystectomy for cholecystocholedocholithiasis: a meta-analysis. Surgical Endoscopy. 2018;33:3275-3286.

9. Lu J, Cheng Y, Xiong XZ, et al. Two-stage vs single-stage management for concomitant gallstones and common bile duct stones. World Journal of Gastroenterology. 2012;18:3156-3166.

10. Li ZQ, Sun JX, Li B, et al. Meta-analysis of single-stage versus two-staged management for concomitant gallstones and

common bile duct stones. Journal of Minimal Access Surgery. 2020;16:206-214.
11. Bass GA, Pourlotfi A, Donnelly M, et al. Bile duct clearance and cholecystectomy for choledocholithiasis: Definitive single-stage laparoscopic cholecystectomy with intraoperative endoscopic retrograde cholangiopancreatography versus staged procedures. The Journal of Trauma and Acute Care Surgery. 2021;90:240-248.
12. Zhumatayev D.T, Baimakhanov A.N, Abdykadyrov M.K, et al. Simultaneous Surgical Treatment Tactics of Acute Destructive Cholecystitis Combined with Choledocholithiasis: A Case Report. International Journal of Surgery Case Reports. 2020;70:230-233.
13. Sarli L, Costi R, Gobbi S, et al. Scoring system to predict asymptomatic choledocholithiasis before laparoscopic cholecystectomy. Surgical Endoscopy. 2003;17:1396-1403.
14. Friis C, Rothman J.P, Burcharth J, et al. Optimal Timing for Laparoscopic Cholecystectomy After Endoscopic Retrograde Cholangiopancreatography: A Systematic Review. Scandinavian Journal of Surgery. 2017;107:99-106.
15. Terauchi T, Shinozaki H, Shinozaki S, et al. Single-stage endoscopic stone extraction and cholecystectomy during the same hospitalization. Clinical Endoscopy. 2019;52:59-64.
16. Rábago L, Vicente C, Soler F, et al. Two-stage treatment with preoperative endoscopic retrograde cholangiopancreatography (ERCP) compared with single-stage treatment with intraoperative ERCP for patients with symptomatic cholelithiasis with possible choledocholithiasis. Endoscopy. 2006;38:779-786.
17. Costi R, Gnocchi A, Di Mario F, et al. Diagnosis and management of choledocholithiasis in the golden age of imaging, endoscopy and laparoscopy. World Journal of Gastroenterology. 2014;20:13382-13401.
18. Vecchio R, MacFadyen B. Laparoscopic common bile duct exploration. Langenbeck's Archives of Surgery. 2002;387:45-54.
19. Bove A, Di Renzo R.M, Palone G, et al. Single-stage procedure for the treatment of cholecysto-choledocolithiasis: a surgical procedures review. Therapeutics and Clinical Risk Management. 2018;14:305-312.
20. Muhammedoğlu B, Kale I.T. Comparison of the safety and efficacy of single-stage endoscopic retrograde cholangiopancreatography plus laparoscopic cholecystectomy versus two stage ERCP followed by laparoscopic cholecystectomy six-to-eight weeks later: A randomized controlled trial. International Journal of Surgery. 2020;76:37-44.
21. Williams G.L, Vellacott K.D. Selective operative cholangiography and Perioperative endoscopic retrograde cholangiopancreatography (ERCP) during laparoscopic cholecystectomy. Surgical Endoscopy and other Interventional Techniques. 2001;16:465-467.
22. Jones M, Johnson M, Samourjian E, et al. ERCP and laparoscopic cholecystectomy in a combined (one-step) procedure: a random comparison to the standard (two-step) procedure. Surgical Endoscopy. 2012;27:1907-1912.
23. Enochsson L, Lindberg B, Swahn F, et al. Intraoperative endoscopic retrograde cholangiopancreatography (ERCP) to remove common bile duct stones during routine laparoscopic cholecystectomy does not prolong hospitalization: a 2-year experience. Surgical Endoscopy. 2004;18:367-371.
24. Pesce A, Greca G, Latteri S, et al. Laparo-endoscopic rendez-vous versus sequential "delayed" approach in patients with choledocholithiasis. Minerva Chirurgica. 2017;72:98-102.
25. Zang J.F, Zhang C, Gao J.Y. Endoscopic retrograde cholangiopancreatography and laparoscopic cholecystectomy during the same session: feasibility and safety. World Journal of Gastroenterology. 2013;19:6093-6097.
26. Anderson M.A, Fisher L, Jain R, et al. Complications of ERCP. Gastrointestinal Endoscopy. 2012;75:467-473.
27. Cotton P.B, Garrow D.A, Gallagher J, et al. Risk factors for complications after ERCP: a multivariate analysis of 11,497 procedures over 12 years. Gastrointestinal Endoscopy. 2009;70:80-88.