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# ҚАЗАҚСТАН ХИРУРГИЯСЫНЫҢ ХАБАРШЫСЫ

# ВЕСТНИК ХИРУРГИИ КАЗАХСТАНА

# BULLETIN OF SURGERY IN KAZAKHSTAN

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# BULLETIN OF SURGERY IN KAZAKHSTAN

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## МАЗМҰНЫ



## СОДЕРЖАНИЕ



## CONTENTS

## МАЗМҰНЫ



### ӘРІПТЕСТІ ЕСКЕ АЛУ



## СОДЕРЖАНИЕ



### ПАМЯТИ КОЛЛЕГИ



## CONTENTS



### IN MEMORY OF COLLEAGUE

# "IN THE FIGHT FOR THE PEOPLE'S LIFE"

## (TO THE 75TH ANNIVERSARY OF A.N. SYZGANOV NSCS'S FOUNDING)

**Baimakhanov B.B., Medeubekov U.Sh., Sagatov I.Y., Aubakirova A.T.**
National Scientific Center of Surgery named after A.N. Syzganov, Almaty, Kazakhstan

This year JSC "A.N. Syzganov National Scientific Center for Surgery" marks 75 years since its foundation. For many decades, the center has been the flagship of domestic surgery, an organizational, methodological and coordination center for the provision of high-tech medical services to the population of our republic. Today the center occupies a leading place among the multidisciplinary medical clinics of the country, where all types of surgical interventions are performed, as well as transplant care is provided to the population of the republic. The center preserves its traditions and remembers everyone who contributed to its development.

On March 26, 1945, it was decided to organize the surgery sector of the Kazakh branch of the USSR Academy of Sciences in order to create scientific foundations for solving the problems of population surgical care that were urgent at that time.

The Kazakh Research Institute of Clinical and Experimental Surgery, which arose on May 15, 1945 by a decree of the Kazakh branch Presidium of the of USSR Academy of Sciences on the basis of the hospital of reconstructive surgery and the Department of General Surgery of the Alma-Ata Medical Institute with 25 staff units, today gained fame and turned into a large independent multidisciplinary research institution in Kazakhstan with its own clinical base.

One of the main tasks assigned to the institute in the post-war period was the treatment and rehabilitation of the wounded and disabled of the Great Patriotic War, as well as the task of studying and solving the problem of industrial and agricultural injuries.

In the first decades, the most rational methods of combating industrial and agricultural injuries were developed and introduced into practice, original methods were developed to prevent purulent complications in injuries.

A special place in the activities of the Institute of those years is occupied by the study of combined radiation injuries, the peculiarities of the wound process taking place under conditions of acute radiation sickness. On the initiative of the institute in Alma-Ata at the children's hospital in Aksai, where children with lesions after poliomyelitis were treated, an orthopedic department was founded, and collosilicate prostheses were created and introduced.

In 1954, a laboratory of medical radiology was organized at the institute, provided with technical personnel and equipment. Radioactive iodine, phosphorus, and colloidal gold began to be used for scientific and diagnostic purposes. These implementations helped to determine the functional state of the thyroid gland, kidneys, liver, and lungs.

For many years, the staff of the institute have devoted to the development of measures to deal with the problem of the national level - endemic goiter. Scientific expeditionary research made it possible to compile the clinical and statistical characteristics of the endemic goiter in the republic, to establish its features and to determine the foci of spread. Thereupon, a system of planned preventive and surgical care for the population was developed and organized. On the recommendation offered by the institute, a Republican antigoiter dispensary with branches in regional centers was opened, and a surgical endocrinology department was organized at the institute itself.

In the framework of the fight against oncological diseases, in September 1956, the first in the republic research oncological department was created at the institute - the oncology sector with an experimental cancer laboratory. Carrying out organizational anticancer work, the oncology sector developed and sent out guidelines for the scientific study of statistical materials on cancer incidence in Kazakhstan to regional oncological dispensaries. From 1956 to 1960, a study of the prevalence of malignant neoplasms in the republic was carried out using expeditionary and statistical materials from regional oncological dispensaries. In 1960, on the basis of the above sector, the Kazakh Research Institute of Oncology and Radiology was created. On the basis of the results of complex scientific research, for the first time in Kazakhstan, the Institute has developed many original methods of fighting oncological diseases. As a result, an original physiological theory of carcinogenesis was created, which makes it possible to develop methods for the mass prevention of malignant tumors.

The Institute was the first in the republic to introduce methods of surgical treatment of various lung diseases into clinical practice. In 1949, the first lung operation was performed in Kazakhstan. The necessity of wider introduction of modern methods of tuberculosis surgical treatment into the practice of anti-tuberculosis institutions has been scientifically substantiated. In 1950, a department of thoracic surgery was created, where scientific research was carried out, and surgical aid was provided to patients with nonspecific lung diseases. On the basis of the sanatorium "Kamenskoe plateau" a specialized surgical department was created, where in high mountain conditions methods of surgical treatment of pulmonary tuberculosis began to be successfully and widely used for the first time. A similar department was created on the basis of the Kazakh railway antituberculosis dispensary.

Since 1956, the institute began to introduce physiological methods for the diagnosis of cardiovascular diseases - electrocardiography, phonocardiography, rheography, electrogastrographic methods for assessing the stomach function, and the gas and acid-base composition of blood was studied as well.

In 1958, the institute began a great deal of work on the organization of modern cardiac surgery in the republic. A department of cardiac surgery was organized and opened in Kazakhstan for the first time. In the first years of the department existence, the

staff of the institute studied the issues of the clinic and diagnostics of the most common heart defects, mastered and introduced into practice the technique of mitral commissurotomy and closure of the patent ductus arteriosus, determined the possibility of performing mitral commissurotomy operation in conditions of an active rheumatic process. The first heart operation was performed on November 18, 1958. In 1960, the institute performed the first ligation of the patent ductus arteriosus for congenital heart disease.

Success in the provision of cardiac surgery directly depended on the level of anesthetic management development and the possibility of postoperative nursing of patients. In 1958 an anesthesiology service was organized at the institute, and in 1960 an anesthesiology department was founded. In November 1964 an anesthesiology laboratory was opened, and in 1965 a postoperative observation department was organized. The experience gained in postoperative observation and nursing of critically ill patients allowed the institute to organize in 1967 the Republican intensive care center, which in 1970 became a full-fledged anesthesiological department, which included intensive care wards for cardiovascular and pulmonological patients with its own express laboratory and engineering and technical service;

In 1967, for the first time in Kazakhstan, the Institute organized a vascular department and began training scientific personnel to study and develop methods for diagnostics and surgical treatment of main and peripheral blood vessels. A team of scientists began various studies on the diagnosis and treatment of such acute pathologies of the magistral blood vessels as thromboembolism, dissecting aneurysm, phlebothrombosis and vascular injury.

In the period 1975-1980. The institute's staff paid much attention to the thoracic surgery development in Kazakhstan, research on the development of methods for detecting hidden wound infections, primary treatment of wounds and open fractures of the limb, plastic replacement of skin defects, issues of anesthesia in the treatment of diseases of venous vessels of the limbs and acute thromboembolism.

In 1975, for the first time in the country, the Institute organized a department of esophagus and stomach surgery, whose employees began research and development of methods for treating perforations of the esophagus, as well as post-burn strictures of the esophagus, including forced bougienage followed by prolonged intubation of the esophagus with a tube of an original design, methods of treating combined injuries esophagus and stomach, formation of the esophagus from the stomach. In 1977, the scientists of the Institute began research on the method of selective proximal vagotomy for the treatment of duodenal ulcer and stomach ulcer. In the same period, methods of surgery were developed to remove the thymus gland for myasthenia gravis and multiple sclerosis.

In 1978, for the first time in Kazakhstan, at the department of anesthesiology and resuscitation of the institute, a group was created, and then a department of hyperbaric oxygenation.

A task was set for the staff of the institute and in 1978 the institute for the first time in Kazakhstan began a great deal of work on the organization of modern care for patients with acute and chronic renal failure.

In May 1978, on the basis of the Institute, the Kazakh Republican Center for Transplantation and Artificial Organs was organized. It included a clinical department with an operating unit and intensive care unit, a group for the procurement and preservation of donor organs, a hemodialysis unit, an immunological typing group and a biochemical laboratory.

In October 1978, the first hemodialysis session in Kazakhstan was carried out on a patient with end-stage chronic renal failure on an experimental Soviet hemodialysis unit SGD-8.

On April 12, 1979, the first operation in the republic for autotransplantation of a kidney was carried out in a patient with long ureteral insufficiency. And already on April 17, 1979, for the first time in Kazakhstan, a cadaveric donor kidney was successfully transplanted. In 1980, the institute was named after its founder and first director, academician A.N. Syzganov.

Since 1980, the institute's staff were tasked with researching and developing methods of reconstructive surgery on the organs of blood circulation, respiration, and digestion.

In 1980, for the first time in Kazakhstan, the institute performed reconstructive-plastic surgery on the esophagus with its cicatricial narrowing, the so-called plastic surgery of the esophagus. Thanks to scientific research and the introduction of new methods in the field of esophageal surgery, the center has been able to significantly reduce mortality and the frequency of complications in diseases and organ injuries.

In 1980, a specialized department was organized and founded for the first time in Kazakhstan, which began to deal with the problems of liver surgery. The scientific topics of the department were aimed at the development of new and improvement of existing methods of surgical treatment of liver diseases, gallstone disease, complicated jaundice, postcholecystectomy syndromes, echinococcosis, development of methods for reconstructive and restorative surgery of the biliary tract, surgical treatment of focal and diffuse liver diseases , the pancreas.

The research group of the institute was looking for new ways to solve surgical problems in many pressing health problems. The Institute paid great attention to the issues of abdominal and thoracic surgery. This applies to surgery of the esophagus, thymus, stomach, duodenum, liver and biliary tract, pancreas, lungs, vascular surgery. During this period of development, the institute explored the possibilities of introducing the achievements of scientific and technical progress into practice: lasers and laser instruments, ultrasonic and plasma devices, methods of intravascular embolization of the affected part of organs, new medical and diagnostic technologies in order to increase the efficiency of surgical treatment.

In 1983, a microsurgery group was founded in the center, and in 1986 the first microsurgery department in Kazakhstan was organized. Along with traditional angiosurgery, for the first time in Kazakhstan, microsurgery methods were used to vocational rehabilitation of patients doomed to disability.

Research in the field of thoracic and pulmonary surgery has become a great contribution to national science and practice. Scientific research during this period of development of the Institute was aimed at the development and implementation of modern methods of diagnosis and treatment of surgical lungs and pleura diseases into clinical practice. At the department of thoracic surgery, various types of complex reconstructive operations on the trachea and large bronchi, extirpation of the bronchi with preservation of the pulmonary parenchyma and pulmonary vessels, as well as the surgical treatment of bilateral lung lesions were studied.

Research was carried out on the diagnostic capabilities of X-ray, endoscopic, electrophysiological, radioisotope, endovascular methods to assess indications and contraindications for lung operations, and methods of intraoperative diagnostics. For the development of treatment methods and clinical examination of patients with chronic nonspecific diseases of the lungs and pleura, esophagus and mediastinum, fundamental research in the field of studying the causes of the development and treatment of pulmonary heart disease, scientists of the institute were awarded the State Prize of the Kazakh SSR in the field of science and technology (for 1988).

Despite the difficulties of the transition period due to the collapse of the USSR and the difficult economic situation of the first years of Kazakhstan independence, the staff of the institute carried out a large research work on the transplantation development in Kazakhstan.

In 1991, for the first time in the republic, autotransplantation of the pancreas was carried out in primary chronic pancreatitis on the basis of experimental studies carried out by the center. In 1994, a pancreatic islet transplant was performed for the diabetes mellitus treatment.

In 1994, by the decree of the Cabinet of Ministers of the Republic of Kazakhstan "Research Institute of Clinical and Experimental Surgery named after A.N. Syzganov "was transformed into" Scientific Center of Surgery named after A.N. Syzganov "MH RK. In 2000, by the decree of the Government, the center was given the status of the National Scientific Center and was renamed again.

The center has carried out comprehensive experimental and clinical studies to study the possibility of transplanting hepatocytes of the human fetus for the treatment of liver cirrhosis. In 1996, a heterotopic liver allotransplantation operation was performed for the first time in Kazakhstan.

The introduction of new technologies and developments allowed the center to be the first in Kazakhstan to begin to carry out operations of liver resection, laparoscopic removal of the gallbladder, ovarian cysts, appendectomy, etc. Subsequently, over a number of years, these bloodless and minimally invasive technologies were successfully introduced by the center's staff in the regions of Kazakhstan. Along with the development of laparoscopic surgery, since 1997, endovideoscopic surgery in gynecology began to develop for the first time in Kazakhstan.

The cardiac surgery service of Kazakhstan also received further development. During heart surgery, for the first time in the country, methods of prosthetics of heart valves under artificial circulation and various options for moderate and profound hypothermia were introduced, methods of closed mitral commissurotomy were introduced. Methods of surgical treatment of congenital heart defects have been investigated and implemented. For the first time in Kazakhstan, surgical cardiac care began to be provided to children under three years. Research has been conducted on the surgical treatment of congenital heart defects complicated by high pulmonary hypertension.

The service of vascular surgery also developed. The team carried out work on the study of problems of diagnosis and surgical treatment of diseases of the aorta and its branches. For the first time in Kazakhstan, the possibilities of using synthetic prostheses and biotransplants in reconstructive vascular surgery were investigated. For the first time in the republic, the reconstruction of the brachiocephalic branches of the aorta by extrapleural access was carried out. Methods of surgical treatment of aorta coarctation, combined occlusive lesions of the thoracoabdominal aorta and limb arteries have been developed and implemented. The problems of surgical treatment of malignant and symptomatic arterial hypertension, various forms of aneurysms and arteriovenous fistulas, post-thrombophlebitic syndrome, and chest exit syndrome were studied.

The development of the possibilities of anesthetic management, the introduction of the technology of bloodless and minimally invasive operations, and the shortening of the time spent on performing the intervention allowed the center to develop the technique and conditions for performing simultaneous operations. The use of one-stage operations made it possible to significantly reduce the time of treatment and rehabilitation of patients.

Since 1999, the center has introduced new minimally invasive research methods: magnetic resonance angiography and magnetic resonance cholangiopancreatography for the first time in Kazakhstan, which make it possible to obtain direct images of blood vessels and biliary tract. Methods of transesophageal, transvaginal, transrectal and intraoperative sonography, puncture studies under ultrasound control have been developed. The center studied the possibilities of performing percutaneous puncture methods of treating nonparasitic liver cysts and obstructive jaundice under the control of ultrasound and CT. The team of the center investigated echo signs of exophytic, endophytic and mixed forms of stomach cancer, carried out systematization of the ultrasound picture of stomach ulcer and stomach polyps, duplex examination of arteries and venous vessels of the extremities, cervical region, abdominal cavity and small pelvis. Methods for ultrasound diagnostics of degenerative changes in the extensor muscles after damage to the radial and peroneal nerves, complex diagnostics of lymphedema of the lower extremities, a technique for transplant echography, renography and angionephroscintigraphy before and after kidney transplantation, dynamic esophagoscintigraphy have been developed.

By the beginning of 2000, thanks to the introduction of new techniques and technologies, the institute acquired the role of a scientific and practical specialized center recognized in the republic and beyond. The team conducted extensive experimental and clinical research on the treatment of gallstone disease and its complications, iatrogenic damage to the biliary tract, postcholecystectomy syndromes, focal and diffuse diseases of the liver and pancreas.

The center devoted much effort and attention to the problem of diagnostics and treatment of obstructive jaundice. The team studied and developed methods of minimally invasive and puncture methods of treatment, reconstructive and restorative operations on the biliary tract.

Great research work has been carried out to study methods of treating complicated and uncomplicated liver echinococcosis. The center conducted research on the use of various methods of processing residual cavities using a laser, electrical, plasma and cryogenic technologies, and methods for their implementation were developed and improved.

The center was one of the first in Kazakhstan to begin research on the treatment of liver cirrhosis in adults and children. The team of the center conducted research on the development of various shunting operations, methods of macro- and microtunneling of the liver, the possibilities of using cell technologies for the treatment of liver cirrhosis.

A large amount of research has been devoted to the study and implementation of resection and reconstructive plastic surgery for diseases of the pancreas, starting with the use of minimally invasive methods and up to volumetric reconstructive interventions. Laparoscopic technologies were actively introduced into surgery.

In 2010, by the decree of the Republic of Kazakhstan Government, the A.N. Syzganov National Scientific Center for Surgery was reorganized into a joint stock company.

At present, the center continues research in all relevant areas of surgery, developing international scientific cooperation and training.

The team pays much attention to researching the problems of diagnosing and treating diseases of the liver, biliary tract, pancreas, esophagus, stomach and mediastinal organs. Modern possibilities of scientific and technological progress allowed the center to solve problems of the development of reconstructive and restorative surgery of the biliary tract, treatment of focal and diffuse liver diseases, surgical treatment of diseases of the duodenum, inflammatory and cystic, benign and malignant diseases of the pancreas and Vater's papilla, endoscopic and minimally invasive surgery hepatopancreatoduodenal zone.

Particular attention is paid to the development of the transplant service in the republic. The results achieved in terms of the number of liver and kidney transplantation operations performed annually, as well as indicators of postoperative complications and graft survival, have allowed the Institute to become a specialized scientific and practical center recognized by the international transplant community.

In recent years, the center has been conducting research on the development of a program for pediatric liver and kidney transplantation for congenital malformations and diseases. In 2019, for the first time in Kazakhstan, a related liver transplant was performed in the center in children under one year of age with congenital liver malformations.

Scientific and practical research of the center is aimed at developing minimally invasive methods for diagnosing and treating diseases of the liver, organs of the gastrointestinal tract and the endocrine system, complex treatment of liver cancer, including transarterial chemoembolization, thermal ablation and liver resection; development of methods for combined treatment of pancreatic cancer; development of methods of kidney transplantation from a living related donor and from a donor with brain death; development of methods for liver transplantation from a living related donor in adults and from a living related donor in children; study of modern and minimally invasive methods of diagnosis and treatment of liver echinococcosis.

Thus, during 75 years of activity, the A.N. Syzganov National Scientific Center for Surgery was and remains the flagship of the domestic surgical school in many areas and services: cardiovascular surgery, thoracic surgery, surgery of the esophagus and stomach, hepatopancreatobiliary surgery, reconstructive and plastic microsurgery.

Today at the A.N. Syzganov National Scientific Center for Surgery employs about 700 people, including 130 doctors and 350 middle and junior medical staff, who continue not only to carry out the most high-tech operations, but also to conduct scientific research on the most relevant topics of surgery and are actively involved in the training of qualified medical personnel for practical healthcare in Kazakhstan.

For all the years of the A.N. Syzganov NSCS existence, 114 doctoral and 331 candidate dissertations were defended within its walls. And today the center continues to train scientific personnel for doctoral studies, master's degrees and residency. Specialists from all regions of Kazakhstan and abroad come to the training courses.

Since January 2017, the Kazakhstan Society of Surgeons, which has branches in all regions of Kazakhstan, has been recreated and successfully unites the country's surgical service.

Honored doctors and professors who have worked at the institute for many years continue to work within the walls of the center. The center maintains close contacts with many scientific institutions of foreign countries and exchanges experience with scientists from Germany, Italy, the Netherlands, Japan, Korea, India, Russia, Ukraine, Belarus, Kyrgyzstan, Uzbekistan, Tajikistan, Azerbaijan, Armenia, etc.

# ORGANIZATION OF INTENSIVE CARE SERVICE FOR PATIENTS WITH COVID-19 DURING PANDEMIA (REVIEW)

МРНТИ 76.01.01

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***Abstract***

*Since the beginning of the new coronavirus infection pandemia over 57.9 million people have been infected and over 1.3 million have died. The world statistics on COVID-19 rates Kazakhstan as 49 with revealed cases of COVID-19 and 53 with deaths cases.*

*In 80% of patients with COVID-19, COVID-19 have mild or moderate disease, about 15% have severe disease requires oxygen support, and 5% have a critical illness requires stay in intensive care units. The average duration of ICU stay is 10.8 days. In 22.7% of patients, ICU length of stay is over 30 days. The mortality rate of patients in intensive care units was 40-61% during the first wave, but in most affected regions it was as high as 90%.*

*In order to improve the results of intensive care, a team-based way introduced in many hospitals. These teams do most labor-consuming and potentially dangerous manipulations. This approach requires a sufficient number of engaged and well-trained staff.*

*In in an acute shortage of ICU staff, some actions assumed to train medical personnel of other specialties to become doctors and nurses in intensive care units. Short and superficial courses, designed to prepare the maximum number of intensive care specialists in the shortest time, as a rule, leads to a deterioration in the quality of the provided intensive care and does not improve results and mortality.*

**Keywords**
*COVID-19 pandemia, critical care, intensive care service organization*

## Пандемия жағдайында COVID-19 науқастарына қарқынды емдеу көмегін ұйымдастыру. (Әдебиет шолуы)

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***Аңдатпа***

*Коронавирустық инфекция тарала басталғаннан бері 57,9 миллион адам осы уақытқа дейін жұқтырды, 1,3 миллион адам қайтыс болды. COVID-19 бойынша дүниежүзілік статистикада Қазақстан инфекцияның анықталған жағдайлары бойынша 49 орында, қайтыс болған науқастар саны бойынша 53 орында тұр.*

*COVID-19-ды жұқтырған науқастардың 80%-ында ауру жеңіл немесе орташа ауыр түрінде өтеді, шамамен 15%-ында оттегінің қолдауын қажет ететін аурудың ауыр ағымы дамиды, ал 5%-ы аса қауіпті ағымға ие, бұл науқастар қарқынды терапия бөлімшесінде ұзақ мерзімді қарқынды терапияны қажет етеді. Сонымен қатар, қарқынды терапия бөлімшесінде науқастардың болуының орташа ұзақтығы 10,8 күнді құрады. Ал 22,7% науқаста қарқынды емдеу бөлімшесінде емдеу ұзақтығы 30 немесе одан көп күнді құрады. Қарқынды терапия бөлімшелеріндегі науқастардың өлім-жітім деңгейі бірінші толқынның шыңына жетті - 40-61%, ал кейбір аймақтарда 90% дейін.*

*Қарқынды терапияның нәтижелерін жақсарту үшін әртүрлі ауыр және ықтимал қауіпі жоғары манипуляцияларды орындауға командалық тәсіл енгізіледі. Бұл тәсіл жұмыспен қамтылған және жақсы дайындалған қызметкерлердің жеткілікті санын қажет етеді.*

*Кадрлардың жетіспеушілігін нәтижесінде, реанимация бөлімшесінің дәрігерлері мен медбикелері болу үшін басқа мамандықтағы медициналық кадрларды даярлау және қайта даярлау бойынша шаралар қабылдануда. Ең қысқа мерзімде қарқынды терапия мамандарының максималды санын дайындауға арналған қысқа және үстірт курстар, әдетте, көрсетілген реанимациялық көмек сапасының нашарлауына әкеліп соқтырады және емдеу нәтижелері мен өлім жағдайларын жақсартпайды.*

**Түйін сөздер**
*COVID-19 пандемия, қарқынды емдеу, қарқынды емдеу көмегін ұйымдастыру*

# Организация реаниматологической помощи пациентам с COVID-19 в условиях пандемии. (Обзор литературы)

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***Аннотация***

*С начала распространения новой коронавирусной инфекции на данный момент инфицированию подверглись 57,9 миллионов человек, умерло 1,3 миллиона. В мировой статистике по COVID-19, Казахстан занимает 49 место по количеству выявленных случаев заражения и 53 место по количеству умерших пациентов.*

*У 80% пациентов с COVID-19 болезнь протекает в легкой или средне-тяжелой форме, примерно у 15% развивается тяжелое течение заболевания, требующее кислородной поддержки, а у 5% наблюдается критическое течение, которое требует достаточно длительной интенсивной терапии в отделениях реанимации. При этом, средняя длительность пребывания пациентов в ОРИТ составила 10,8 суток. А у 22,7% продолжительность лечения в ОРИТ составила 30 и более дней. Летальность пациентов, находящихся в отделениях реанимации достигала на пике первой волны 40-61%, а в некоторых регионах до 90%.*

*С целью улучшения результатов интенсивной терапии внедряется командный подход к выполнению различных трудоемких и потенциально опасных манипуляций. Такой подход требует наличия достаточного количества задействованного и хорошо подготовленного персонала.*

*Испытывая резкий дефицит кадров, предпринимаются меры по подготовке и переквалификации медицинского персонала других специальностей во врачей и медицинских сестер отделений интенсивной терапии. Краткие и поверхностные курсы, предназначенные в кратчайшие сроки подготовить максимальное количество специалистов по интенсивной терапии, как правило приводит к ухудшению качества предоставляемой реаниматологической помощи не улучшает результаты лечения и летальности.*

**Ключевые слова**
*Пандемия COVID-19, интенсивная терапия, организация реанимационной помощи*

In December 2019, an outbreak of respiratory infection caused by an unknown coronavirus occurred in Wuhan, Hubei Province, People's Republic of China. The causative agent of the new coronavirus infection is believed to be a recombinant of the bat coronavirus and the unknown in origin coronavirus. On February 11, 2020, it was named SARS-CoV-2 by the International Virus Taxonomy Committee. At the same time, the World Health Organization (WHO) has assigned the official name of the infection caused by the new coronavirus - Coronavirus disease 2019 (COVID-19). Given the wide and rapid spread of SARS-CoV-2, WHO announced the start of the COVID-19 pandemic on 11 March 2020.

Since the spread of the new coronavirus infection, 57.9 million people have been infected so far and 1.3 million have died. According to Dadax, Kazakhstan ranks 49th in the number of detected cases of infection and 53rd in the number of patients who died (https://www.worldometers.info/coronavirus/).

The terms "novel coronavirus infection", SARS-CoV-2 virus infection and COVID-19 disease are synonymous.

The causative agent COVID-19 can be detected 1–2 days before symptoms appear and within 7–14 days after symptoms appear in upper respiratory tract swabs. In severe forms, a longer shedding of the virus is possible. Data on the duration and strength of immunity for SARS-CoV-2 are currently ambiguous.

The main target of the virus is type II alveolar cells (AT2) of the lungs, which have type II angiosin-converting enzyme (ACE2) receptors, which determines the development of pneumonia. In the pathogenesis of severe forms of the disease, a significant role belongs to the cytokine storm with the release of an excess amount of pro-inflammatory cytokines, primarily interleukin-6 (IL-6).

The incubation period, according to many centers, lasts from 2 to 14 days, on average 5-7 days.

Epidemiological and virological studies show that transmission of infection occurs mainly from patients with a clinically pronounced picture of the disease to other people through close contact by airborne droplets, through direct contact with an infected person or through contact with infected objects and surfaces (1-3).

Clinical and virological studies, during which repeated collection of biological samples from patients with confirmed infection were carried out, show that the release of SARS-CoV-2 occurs most intensively from the upper respiratory tract (nose and throat) in the early stages of the disease (5-7). within the first 3 days after the onset of symptoms (7-9).

In the clinical picture, the most common symptoms are;

- increased body temperature (> 90%);
- cough (dry or with a small amount of phlegm) in 80% of cases;

– shortness of breath (55%), while the most severe shortness of breath develops by 6-8 days from the moment of infection;
– myalgia and fatigue (44%);
– a feeling of congestion in the chest (> 20%).

The first symptoms may include:
– myalgia (11%);
– confusion of consciousness (9%);
– headaches (8%);
– hemoptysis (5%);
– diarrhea (3%);
– nausea, vomiting;
– heartbeat.

These symptoms at the onset of infection can be observed in the absence of an increase in body temperature.

Clinical variants and manifestations of COVID-19:
– acute respiratory viral infection (affecting only the upper respiratory tract);
– pneumonia without respiratory failure;
– pneumonia with ARF;
– ARDS;
– sepsis;
– septic (infectious toxic) shock.

COVID-19 can be accompanied by mental and neurological disorders, including delirium or encephalopathy, agitation, stroke, meningoencephalitis, impaired smell or taste (19), anxiety, depression, and sleep disturbances. In many cases, neurological manifestations were observed even in patients without respiratory symptoms.

Classification of COVID-19 by severity:

Light:
– Body temperature below 38.5$^0$C, cough, weakness, sore throat.
– Lack of criteria for moderate and severe course.

Moderate:
– Fever above 38.5 0C;
– NPV more than 22 / min;
– Shortness of breath during physical exertion;
– Pneumonia (confirmed by CT of the lungs);
– SpO2 <95%;
– serum CRP over 10 mg / l.

Severe:
– NPV more than 30 / min;
– SpO2 ≤ 93%;
– PaO2 / FiO2 ≤ 300 mm Hg;
– Progression of pneumonia (increase in the area of infiltrative changes by more than 50% after 24-48 hours);
– Decrease in the level of consciousness, agitation;
– Unstable hemodynamics (systolic blood pressure less than 90 mm Hg or diastolic blood pressure less than 60 mm Hg, diuresis less than 20 ml / hour);
– Arterial blood lactate> 2 mmol / L;
– qSOFA> 2 points.

Extremely severe:
– ONE with the need for respiratory support (invasive ventilation);
– Septic shock;
– Multiple organ failure.

Severe, extremely severe, and sometimes moderately severe course of the disease requires the transfer of the patient to the intensive care unit and intensive care unit.

In the context of the fight against COVID-19, WHO has set the following objectives for health systems: 1) slow down and stop transmission of the virus; 2) ensure optimal care for all patients; 3) minimize the negative impact of the epidemic on health systems, social services and economic activities.

As part of solving these problems, in order to ensure a timely increase in the volume of clinical and sanitary-epidemiological measures, the WHO document "Practical aspects of organizing the management of COVID-19 cases in hospitals and at home" was prepared, describing the key actions that should be taken in each of the following transmission scenarios: no cases; sporadic cases; clusters of cases; the spread of the virus among the population.

While most patients with COVID-19 have mild (40%) or moderate to severe (40%) disease, about 15% develop severe disease requiring oxygen support, and 5% have extremely severe disease ( critical) course with complications such as respiratory failure, acute respiratory distress syndrome (ARDS), sepsis, septic shock, thromboembolism and / or multiple organ failure, including acute kidney and heart damage (10). Elderly age, smoking (11, 12), and comorbidities such as diabetes, arterial hypertension, heart disease, chronic lung disease, and cancer are noted as risk factors for the development of severe illness and death. The results of multivariate analysis confirmed that older age, a high score on the scale for dynamic assessment of the severity of organ failure (SOFA) and the D-dimer marker> 1 μg / L during hospitalization correlated with higher mortality (13, 14).

The mortality rate of patients in intensive care units at the peak of the first wave reached 40-61%, and in some regions up to 90%, despite the use of high-tech methods of intensive care (15,16, 17).

In addition, the very implementation of intensive care measures in some clinics was quite problematic due to the lack of resources, which arose because of a large number of critically ill patients and the length of their stay in intensive care units (18).

While COVID-19 has spread globally, the burden on healthcare facilities is not uniform, a number of regions in Italy that have experienced rapid spread

of the virus reported lack or lack of resources in the healthcare system, which appears to have contributed to the high mortality (16). At the same time, clinics in Canada located in regions with a lower number of infected people reported a mortality rate of resuscitation patients of about 15% (19).

In China, Italy and the United States, 70-90% of patients admitted to the intensive care unit required invasive ventilation on the first day. 65.9% of patients required vasopressor and inotropic support. Acute renal failure observed in 27.1% of patients admitted to the ICU. At the same time, the average duration of ICU stay was 10.8 days. In 22.7%, the duration of treatment in the ICU was 30 or more days.

The data above reflects the enormous burden on intensive care units around the world.

Faced with serious challenges in providing medical care to patients with COVID-19, many hospitals around the world have identified the main ones:

- insufficient number of beds in medical institutions
- insufficient number of beds in intensive care units
- insufficient number of intensive care doctors
- insufficient number of nurses in the intensive care and intensive care units
- insufficient number of artificial lung ventilation devices

The pronounced shortage of both medical and non-medical personnel limits the real possibilities of medical institutions.

The surge in demand for health care is adding to the pressure on inpatient unit capacity, affecting the intensive care sector the most.

Rapid changes in conditions necessitate constant professional development of personnel, as well as frequent and accurate updating of information.

Most countries, along with the organization of logistics activities to equip and provide hospitals with medicines, personal protective equipment, medical equipment, increase the hospital bed capacity, attract additional medical personnel and create consultation centers. At the state level, programs for additional funding, training and attracting specialists are being developed, new clinics are being built.

The government of many countries has taken a number of measures to organize, optimize and improve the health sector during the pandemic:

- opening kindergartens and schools for the children of medical workers, as well as representatives of other professions experiencing increased stress during the pandemic;
- simplification of the requirements for licensing and registration of medical workers;
- attraction of retired medical workers, as well as graduate medical students;
- attracting students of medical universities;
- engaging civilian and military services to assist nursing staff;
- provision of security measures for medical workers in private practice, including through telemedicine;
- providing medical personnel with regular testing for the virus;
- cooperation of government agencies with private clinics;
- development and production of our own models of ventilators;
- construction of new intensive care units based on congress halls, stadiums, mobile hospitals, floating clinics, etc .;
- reduced requirements for clinical trials and administrative reporting;
- permission for patients who received prescription drugs to purchase them in the future from local pharmacies without a prescription;
- organization of a drug delivery service to the most vulnerable groups of the population;
- temporary suspension of planned operations;
- suspension of the export of medicines, protective clothing and medical masks;
- creation of strategic reserves of medicines and protective equipment;
- creation of a medical emergency response team of volunteer doctors to work in regions with the most difficult situation with COVID-19 and to help health organizations;
- simplification of public procurement procedures;
- strict regulation of prices for medicines;
- redistribution of patients to reduce the burden on clinics in the most affected regions;
- Providing medical and social workers with free travel in public transport and taxis;
- restricting access to clinics for the patient's relatives (20).

At the same time, most of the measures taken help to buy time to strengthen the health system and improve the efficiency of infrastructure, but they do little to optimize the most essential element of health care - the medical and auxiliary personnel of intensive care units. To provide medical care to critically ill patients, trained multidisciplinary specialists (resuscitators) are required who are able to control any changes associated with both this complex disease and the decompensating of coexisting diseases (21).

From open news sources, we know that to reduce the workload on staff in intensive care units and protect them from infection, each hospital separately creates different teams that perform separate functions: a team for tracheal intubation, a team for cardiopulmonary resuscitation (22 , 23),

a team of consultants, a team for transporting critically ill patients inside the hospital, teams of physiotherapists, etc. Moreover, the composition and appointment of such teams is determined by each clinic itself. For example, in hospitals in China, the team of specialists in tracheal intubation and the team for resuscitation involves 4-18 people in each, in addition to the main practical assistance in the departments of the clinic where these teams are created, they are engaged in methodological assistance in the form of developing various nosocomial guidelines and algorithms.

This approach requires a large number of committed and well-trained staff. In addition, there is debate about the appropriateness of such teams, believing that the creation of a sufficient number of fully equipped special kits for tracheal intubation and "points" for resuscitation, significantly reduces the need for such teams (24).

Remote counseling centers are most often organized on the basis of medical universities. Such centers include specialists from various fields of intensive care, pulmonology, hematology, neurology, nephrology, epidemiology and other areas of medicine. The tasks of these centers, in addition to advisory assistance, usually include the development of recommendations and guidelines (22). Such centers do not provide practical assistance.

In many capitalist countries, most of the health care system is a private business-oriented sector, with no common management approach. For example, in the United States, where the health care system has a pronounced decentralization, analysts point to the absence of a single central body for managing and organizing health care as a major drawback. At the same time, federal governments do not have enough powers to make such decisions, and attempts to centralize the health care system on a voluntary basis are often met with criticism and misunderstanding (25).

Experiencing a sharp shortage of personnel, health systems in many countries are taking measures to train and retrain medical personnel of other specialties to become doctors and nurses in intensive care units. Short and superficial courses, designed to prepare the maximum number of intensive care specialists in the shortest possible time, usually lead to a deterioration in the quality of the resuscitation care provided, and does not improve treatment results and mortality.

All of the above activities are generally decentralized and are applicable in individual clinics, which makes it difficult to assess the resources of intensive care units on a city or regional scale, and even more so in the country.

In the aspect of the shortage of medical personnel in intensive care units, as well as in order to concentrate information on the available resources and the condition of patients of each medical institution, in our opinion, the most effective will be the creation of mobile multifunctional resuscitation teams, including well-trained intensive care physicians who can simultaneously to provide coordination, methodological, advisory and practical assistance at the local level - in intensive care units, covering all infectious diseases clinics in a settlement or region. By concentrating and analyzing information on the material, technical and human resources of individual intensive care units, information on the condition and dynamics of patients in these departments. Such teams have the potential to provide the listed types of assistance in a timely manner to optimize the treatment, diagnostic and anti-epidemiological processes in intensive care units.

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# TUBAL-PERITONEAL INFERTILITY. ETIOPATHOGENESIS AND DIAGNOSTICS. REVIEW

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***Abstract***

*Today, in the field of modern technologies, despite successes in the field of reproductology and advanced assisted reproductive technologies (ART), the frequency of infertile marriage has not only not stabilized, but also increased over the year, reaching 25-30% in the population. Tubal peritoneal infertility is one of the leading places in the frequency of occurrence of various factors leading to the absence of an oncoming pregnancy.*

**Keywords**
*infertility, tubal-peritoneal factor, proxy obstruction of the fallopian tubes, selective hysterosalpingography, transcatheter recanalization of the fallopian tubes*

## Түтікті-перитонеальды бедеулік. Этиопатогенезі және диагностикасы. (Әдебиет шолуы)

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***Аңдатпа***

*Қазіргі заманғы технологиялар саласында, репродуктология саласындағы жетістіктер мен жетілдірілген көмекші репродуктивті технологияларға (КРТ) қарамастан, бедеулік некенің жиілігі тұрақтандырып қана қоймай, жыл сайын өсіп, халықтың 25-30% құрады. Түтікті перитонеальді бедеулік - бұл алдағы жүктіліктің болмауына әкелетін әртүрлі факторлардың пайда болу жиілігі бойынша жетекші орындардың бірі.*

**Түйін сөздер**
*бедеулік, түтікті -перитонеальді фактор, жатыр түтіктерінің проксимальді кедергісі, селективті гистеросальпингография, жатыр түтіктердің транскатетерді реканализациясы*

## Трубно-перитонеальное бесплодие. Этиопатогенез и диагностика. (Обзор литературы)

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***Аннотация***

*На сегодняшний день, в век современных технологий, несмотря на успехи в репродуктологии и усовершенствований методов вспомогательных репродуктивных технологий (ВРТ), частота бесплодного брака, не только не стабилизировалась, но и увеличивается из года в год, достигнув показателей 25-30% в популяции. Трубно-перитонеальное бесплодие находится на одном из ведущих мест по частоте встречаемости различных факторов, приводящих к отсутствию наступления беременности.*

**Ключевые слова**
*бесплодие, трубно-перитонеальный фактор, проксиальная непроходимость маточных труб, селективная гистеросальпингография, чрескатетерная реканализация маточных труб*

Female infertility of tubal origin – the absence of the desired pregnancy due to a congenital abnormality of the fallopian tubes or tubal: obstruction, blockage, stenosis (code N97. 1 in the International classification of diseases of the 10th revision (ICD; 10) (International Classification of Diseases, ICD). [1]

Infertility is considered a marriage in which a woman of childbearing age does not become pregnant during a year of regular sexual activity without the use of contraceptives.

According to many authors, the frequency of infertile marriage in the world is 10-15%, and in Kazakhstan it reaches up to 17%. [2, 3, 4, 5]

The female factor in infertile marriage is 40%, the share of the male factor occurs in 40% of cases, and in other cases of infertility there is a combined factor, both female and male. [6]. In this regard, the search for new methods and their improvement, as well as reducing the cost of infertility treatment, are very relevant.

According to most authors, tubal obstruction is the main cause of infertility in women in 25-35% of cases. Ovcharenko D. V. came to the conclusion that more than 50% of fallopian tube obstruction is a consequence of infectious and inflammatory processes of the genitourinary and, less often, digestive systems. [3,6,7].

According to D. N. Isaikin et al., the leading place in the Genesis of reproductive disorders is occupied by the tubal-peritoneal factor (43%), genital endometriosis, endocrine infertility, and benign neoplasms of the pelvic organs are somewhat less common [8,9].

Tubal-peritoneal infertility in the modern world continues to hold a leading position in the structure of female fertility due to sexually transmitted diseases, unsafe abortions and postpartum pelvic infections. K. Vaid et al. (2014) they indicate that in the structure of female infertility, the tubal-peritoneal factor is 40-50%.

Tubal-peritoneal infertility factors in the form of impaired patency and functional failure of the fallopian tubes are detected in 29.5-83% of patients with impaired generative function. In primary infertility, the incidence of fallopian tube damage is 29.5–70%, in secondary infertility-42-83%. [10]

Inflammatory damage to the fallopian tubes is the leading cause of infertility. In a report by O. Jaiycoba et al. (2011) showed that every year 120-180 women out of every 10 thousand at the age of 15-24 years, 30-90 per 10 thousand at 15-44 years, there is inflammation of the genitals. As a result of a chronic inflammatory process that occurs with damage to the fallopian tubes, the risk of tubal-peritoneal infertility is high. Every fifth woman with a history of chronic inflammation of the appendages suffers from infertility, while 70% of them have a fourth degree of adhesions in the pelvis, in which damage to the fallopian tubes is irreversible even with the help of surgical treatment.

Studying the causes of infertility in women, a number of experts have concluded that tubal infertility, associated with a mechanical barrier to the fusion of the sperm with the egg, has the greatest share; its frequency on average is 42.5-80.5%. The formation of connective tissue adhesions between the visceral and parietal peritoneum of the pelvis helps to change not only the anatomical but also the functional state of the internal genital organs, which is accompanied by disorders of the mechanisms of ovulation, the perception of the egg and its transport, the formation of chronic pain syndrome, dyspareunia, dysmenorrhea, dysfunction of adjacent organs. [7]

In 25% of women, tubal-peritoneal infertility was caused by previous surgical interventions. Surgical interventions for various non-inflammatory gynecological diseases, regardless of the type of surgical access, in 81% of operated women lead to the occurrence of adhesions, and the frequency of adhesions after gluttony is 89.2%, and after laparoscopic operations – slightly less – 71.5%.

H.C.Wiesenfeld et al. (2012) note that there is no decrease in the frequency of tubal-peritoneal infertility against the background of an officially registered decrease in the frequency of acute inflammatory diseases of the pelvic organs. The authors believe that in fact, there is no reduction in the incidence of acute adnexitis, but there is a change in the course of PID – the frequency of their subclinical course increases in women with chlamydia and gonococcal cervicitis and/or bacterial vaginosis. In addition, a significant factor that reduces the quality of PID therapy is the late start, incorrect choice, and premature cancellation of antibacterial therapy.

The main risk factors for chronic inflammatory diseases in women of reproductive age: sexually transmitted diseases, spontaneous and artificial abortions, IUD administration. The inflammatory process is one of the most frequent complications of intrauterine medical and diagnostic manipulations, including artificial termination of pregnancy.

According to F. Herrero (2009), 58% of women developed secondary tubal-peritoneal infertility after undergoing a medical abortion. The authors also concluded that the cause of fallopian tube occlusion may be not only infectious inflammation, but also adhesions after operations on the pelvic or abdominal organs, especially after destructive forms of appendicitis, myomectomy, ovarian resection, salpingectomy for tubal pregnancy. Despite the fact that endoscopic access during surgery for tubal pregnancy is more preferable in terms of postop-

erative complications and restoration of women's reproductive function, for emergency indications, many hospitals in our Republic still use laparotomic access and perform removal of the fallopian tube. According to many researchers, 70-80% of women experience infertility after such operations [3,11,12].

Therefore, the development and implementation of endoscopic access and organ-preserving approaches in the treatment of patients with any gynecological diseases can reduce the number of patients with infertility. In addition, complications after medical abortions, spontaneous miscarriages, and intrauterine surgeries are common causes of secondary tubal infertility. Tubal infertility can lead to tumors of the uterus and ovaries, in which either mechanical compression of the fallopian tubes occurs, or their functional state is disturbed.

According to Yakovleva N. V. (2014), tubal obstruction caused by endometriosis occurs in 11-15% of cases. Lesions of the fallopian tubes can manifest themselves not only in the form of occlusion, but also in changes in their functional activity, as a result of which the promotion of sperm, the capture of an egg and its transport after fertilization to the uterus is disrupted.

Violation of the patency of the fallopian tubes is one of the leading causes of infertile marriage and according to world statistics is 35-40% [13]. The average incidence of obturation lesions of the fallopian tubes among women suffering from infertility is from 10% to 33%. [7]

The main group of patients with tubal infertility consists of patients suffering from inflammatory diseases of the genitals. Pelvic inflammatory processes account for 74-80% of all gynecological diseases and 24% of the total number of patients admitted to a gynecological hospital. Most fallopian tube diseases occur as a result of inflammatory processes, which are most often the result of post-abortion and postpartum inflammation, as well as an increase in the number of sexually transmitted diseases (STDs). The frequency of post-inflammatory changes in the fallopian tubes among long-term and unsuccessfully treated patients with a regular menstrual rhythm was 60-85% [12], while more than half of them had impaired tubal patency, 27.7% [23] had hydrosalpinxes, and 3.2% had nodose salpingitis. According to E. A. Yakovleva et al. (2013), the incidence of fallopian tube damage in infertility reaches 70%. Genital inflammatory processes are diagnosed in 60% of patients with primary and 40% with secondary tubal-peritoneal infertility. [14].

Direct changes in pipes are reduced to complete or partial obstruction. According to O. V. Astafieva et al. (2012), complete fallopian tube occlusion is detected in 14.2% of women with infertility, and post-inflammatory changes in the tubes that do not lead to complete occlusion are diagnosed in 9.2% of patients.post-Inflammatory changes developing in the interstitial, isthmic or ampullary sections lead to damage to the muscle layer, adhesions, and peritubar changes.

Post-inflammatory changes in the tube can cause both mechanical obstruction of the tube, and violation of the ciliary, secretory, contractile muscle activity of the fallopian tube and its innervation.

The inflammatory process often spreads to the muscle and serous membrane and causes damage to the neuromuscular fibers, thereby causing a decrease in the contractile function of the fallopian tube. In this regard, some researchers consider violations of the contractile activity of the fallopian tubes after inflammatory diseases one of the main causes of tubal pregnancy and infertility of tubal Genesis. In 40-52% of patients, the result of tubal implantation is an organic pathology of the fallopian tube in the form of scar-dystrophic changes in its muscles. Thus, dystrophic changes in the endosalpinx (in epithelial cells and ciliated epithelium), which lead to an increase in the adhesive component, thereby enhance the interaction of the fetal egg with the mucous membrane. Endocrine, autocrine, and paracrine mechanisms are involved in regulating the function of the fallopian tubes. The ciliated secretory epithelium of the mucosa, smooth muscle tissue of the tube wall and its vessel, as well as the endothelium contain epidermal growth factor (EFR), transforming growth factor (TFR-$\alpha$), and EFR/TFR-$\alpha$ receptors. The EFR/TFR-$\alpha$ ratio is assigned the role of a potential regulator of the movement of epithelial cilia, its secretion, peristalsis, oviduct blood circulation, and epithelial cell proliferation. Stimulation of EGF/TFR-$\alpha$ receptors in a woman's fallopian tube is carried out under the influence of estrogens and prostaglandins, whose imbalance negatively affects the functioning of the fallopian tubes. [12].

Morphological studies of tissues have confirmed that chronic inflammatory diseases of the uterine appendages lead to the disintegration of the muscular and serous membranes of the fallopian tubes. Electron microscopic examination revealed sharp damage to myocytes, edema of the cytoplasm of cells. All taken together, it disrupts or makes impossible both the perception and transport of the egg to the uterus, as well as some stages of its development during its stay in the fallopian tube.

According to the literature, after a single episode of salpingitis, tube obstruction is detected in 11-13%, after a double episode-in 26-35%, with three or more episodes in 54-74% of cases.

20% of patients with tubal infertility develop pelvic adhesions, i.e. there are pronounced anatomical

changes in the internal genitals [10,12].По данным Абашидзе А.А. и соавт. (2014), при лапароскопии у женщин с бесплодием, обусловленным хроническими воспалительными заболеваниями придатков матки, спаечная болезнь органов малого таза выявляется у 86,4%.

The predominant lesion of the ampullary parts of the fallopian tubes is described in all types of salpingitis-even in the experiment, and is a protective mechanism that prevents the spread of infection in ascending and descending salpingitis. A pronounced inflammatory process in these parts of the tubes, followed by fimbria sticking together at the sites of ciliated epithelium death and scarring, leads to gross anatomical changes in the tubes by the type of baggy inflammatory pseudotumors – hydro - and sactosalpinxes. With the long-term existence of hydrosalpinxes, atrophy of the ciliated epithelium occurs, and the prognosis of healing and restoration of the tube function significantly worsens. [7,12]

Genetic determinants have a significant impact on the development of reproductive disorders. In this regard, integrins – the "biological glue of life" - are of interest. Integrins are glycopreins-protein complexes located on the outer membrane of the cell and specifically bind to extracellular structures, consisting of two subunits $\alpha$ - and $\beta$ -, which can non-covalently bind to each other in different combinations, forming more than 20 types of integrins. The classification of integrins is based on the presence of a certain type of $\beta$-subunit in the integrin. Each subunit can be represented by several variants that are encoded by a group of related genes. Thus, the $\beta$-subunit of type III, subtype $\alpha$ (glycoprotein IIIA, or GP IIIA), is represented by two allelic forms-PLAI and PLAII. The GP IIIA gene encodes the formation of specific integrin receptors responsible for intercellular contacts and vascular disorders at the cellular level. Glycoprotein IIb-IIIA (GP IIb-IIIA), a fibrinogen receptor located on the platelet surface, is a key factor in platelet aggregation. The GP IIIA gene has two allelic forms-PLAI and PLAII, respectively, each woman can be homozygous for one of them, or heterozygous. Special attention is paid to the PLAII allele, the occurrence of WHICH is associated with the transition of the thymine nucleotide to the cytisine one in position 196 of the third exon of the Gpiiia gene, and the presence of which is associated with the processes of venous and arterial thrombosis, as well as with implantation disorders, in particular, restriction of trophoblast invasion by surface layers. The frequency of occurrence of the PLAII allele of the Gpiiia gene in the population is approximately 14.5%. [12, 15]

For the first time, the genetic mechanisms of restoring fertility in patients with tubal-peritoneal infertility, in particular, the study of the distribution of allelic forms of the Gpiiia gene, were considered in the work Of S. V. Apresyan et al. (2003). The authors found that surgical restoration of fallopian tube patency is most effective in women who carry the PLAII allele of the Gpiiia gene (heterozygotes). Later, L. A. Salimova (2005) showed that carrying the PLAII allele of the Gpiiia gene in women with inflammation of the uterine appendages increases the likelihood of reproductive disorders, in particular, increases the risk of developing chronic endometritis, luteal insufficiency (NLF syndrome) and infertility. [12]

In the literature there is considerable discussion about the nature of the lesion of the fallopian tubes depending on the microbial factor, which was the cause of the disease. According to the dominant point of view today, the initiators of inflammation in organs and tissues are microorganisms present in the vagina, as well as sexually transmitted. Currently, the infectious factor has the character of mainly mixed infection, while the most common pathologic foci of chronic inflammation in the genitals of women are sexually transmitted microorganisms: chlamydia, Mycoplasma, Ureaplasma, gonococci, Trichomonas, as well as gram-positive and gram-negative aerobic and anaerobic microorganisms. [14]

The cause of tubal occlusion is most often pelvic inflammatory processes caused by sexually transmitted infections (gonorrhea, chlamydia, Ureaplasma, Trichomonas). A modern feature of the course of inflammatory diseases of the uterine appendages is their erased nature, followed by the development of a severe deforming process in the fallopian tubes and tubalўperitoneal infertility. [3,7,12,16]

According to Yakovleva E. A. (2013), the most common microbial agents that cause pelvic inflammatory diseases in women are Chlamidiatrachomatis (25-30%), NeisseriaGonorrhoea(25-40%), Mycoplasmahominis and Ureaplasmaurealiticum (30-40%), polymicrobial associations of opportunistic, pathogenic aerobic and anaerobic microorganisms. All the above-mentioned microorganisms cause low-symptom and subclinical processes, the clinical severity of which does not correspond to the severity of destructive and infiltrative changes in the uterine appendages. Laparoscopy in these cases reveals effusion, obturation of the fallopian tubes, leading to infertility or predisposing to ectopic pregnancy.Общепринято мнение, что хламидийная инфекция протекает практически бессимптомно, вызывая выраженные анатомические изменения маточных труб по типу гидросальпинксов, перитубарные спайки и перигепатит (синдром Fitz-Hygh-Curtis). [16,18]

Unanyan A. L. et al. (2014) revealed electron microscopic features of the fallopian tubes and peritoneal fluid in patients with inflammatory diseases of the uterine appendages of chlamydial etiology. Thus, violations were found in the capillary link of the microcirculatory bed in the form of loss of villi cells, involvement of individual villous epithelial cells in the autolytic process, formation of lymphoid infiltrates, and other changes. According to the authors, the combination of these processes can lead to a decrease in the patency of the fallopian tubes and a violation of the barrier function of the epithelium. The presence of destructive changes in the epithelium, loss of function of the ciliated epithelium of the tubes, violation of their peristalsis can lead to the development of infertility.

A significant influence on the development of salpingitis and tubal infertility is exerted by the state of the immune system of a woman's body. Special importance is attached today to the violation of immunological reactivity, since immune insufficiency weakens compensatory and protective mechanisms, inhibits the development of tissue regeneration processes and prevents the restoration of impaired functions of the reproductive system.

Changes in the endocrine function of the ovaries due to the inflammatory process of the uterine appendages lead to impaired motility of the fallopian tubes in 32-35% of cases. These include functional dishormonal changes-permanent or episodic pathological conditions that cause an imbalance in the hypothalamus-pituitary-ovary system and lead to inadequate secretion of estrogens and progesterone and, accordingly, to a distortion of the contractile function of the fallopian tubes. [12,19]

Petrov Yu. a. et al. (2018) noted that the degree of explication of inflammation is inversely related to the degree of expression of estrogen (ER) and progesterone (PR) receptors. That is, the higher the degree of inflammation, the lower the expression of the ER, PR, and Ki-67 receptors (a marker of rapid proliferation) in the endometrium, which causes infertility by itself in the absence of other factors. Further study of this problem showed that the expression of ER and PR depends on the phase of the menstrual cycle (MC). On day 6-9 of MC, leukocyte infiltration of the stromal and glandular components of the endometrium occurs, resulting in increased expression of both types of receptors (Eripr), which is observed at the initial stages of inflammation.

On day 19-22 of the MC, the uterus is undergoing a proliferation stage, a decrease in PR activity is detected, and the degree of ER expression remains unchanged.

If there are local sclerotic changes in the uterine mucosa, the expression of PR decreases sharply against the background of a stable moderate expression of ER expression throughout the MC.

The problem of timely diagnosis, establishing the etiology of salpingitis, and detecting changes in the immune and endocrine systems is largely complicated by the peculiarities of the current course of the inflammatory process. Due to the multiplicity of sources of infection, a decrease in the pathogenesis of chronic salpingoophoritis of the primary pathogen of the inflammatory process, an increased role of frequent secondary infection, the primary chronic course of the disease with scant clinical symptoms and pronounced anatomical changes in the lesion.

In order to diagnose the anatomical and functional state of the fallopian tubes in infertility, a number of methods are used that are not so much competing as complementary to each other, which differ in the degree of invasiveness and information content.

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# ULTRASOUND DIAGNOSIS OF LIVERCYSTIC ECHINOCOCCOSIS, TREATMENT RESULTS

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***Abstract***

*Timely diagnosis of liver echinococcosis remains relevant to present. In order to improve the diagnosis and treatment of cystic echinococcosis of the liver, the WHO classification (2003) has been developed and introduced into practical medicine, which is used to make a diagnosis and choose a treatment. Ultrasound is a screening method that determines the further tactics of patient management. The ultrasound accuracy reaches 90%. The patients underwent various types of operations, depending on the stage of parasite development and the size of the cysts, and conservative treatment with albendazole was carried out.*

**Keywords**
*ultrasonic diagnosis, liver, echinococcosis, classification, treatment, albendazole, pericystectomy*

## Цисталық бауыр эхинококкозының ультрадыбыстық диагностикасы, емдеу нәтижелері

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***Аңдатпа***

*Бауыр эхинококкозын дер кезінде анықтау бүгінге дейін өзектілігін жойған жоқ. Цисталық бауыр эхинококкозын диагностикалау мен емдеуді жақсарту мақсатында диагноз қою және емдеу әдісін таңдау үшін пайдаланылатын ДСҰ (2003ж.) классификациясы әзірленді және практикалық медицинаға енгізілді. УДЗ – науқастарды бақылаудың әрі қарайғы тактикасын айқындайтын скринингтік әдіс. УДЗ-ның нақтылығы 90%-ға жетеді. Кисталардың өлшемі мен паразиттердің даму сатысына байланысты науқастарға түрлі операциялар жасалды және альбендазол арқылы консервативтік ем жүргізілді.*

**Түйін сөздер**
*ультрадыбыстық диагностика, бауыр, эхинококкоз, классификация, емдеу, альбендазол, перицистэктомия*

## Ультразвуковая диагностика цистного эхинококкоза печени, результаты лечения

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***Аннотация***

*Своевременная диагностика эхинококкоза печени остаётся актуальной по настоящее время. Для улучшения диагностики и лечения цистного эхинококкоза печени разработана и внедрена в практическую медицину классификация ВОЗ(2003г.), которая используется для постановки диагноза и выбора лечения. УЗД – это скрининговый метод, который определяет дальнейшую тактику ведения пациентов. Точность УЗИ достигает 90%. Пациентам выполнены различные виды операций в зависимости от стадии развития паразита и размеров кист и проведено консервативное лечение альбендазолом.*

**Ключевые слова**
*ультразвуковая диагностика, печень, эхинококкоз, классификация, лечение, альбендазол, перицистэктомия*

Cystic echinococcosis is a common zoonotic disease in Central Asian countries. The problem of parasitic liver diseases remains relevant to present. The many domestic and foreign authors are dedicatedworks on this topic. Every year the number of cases does not tend to decrease. In endemic areas, the incidence of echinococcosis in humans reaches 50 per 100,000 inhabitants. In Kazakhstan, more than 800 cases of the disease are detected annually. The most common is liver damage (44-84%). In the early stages of the disease, diagnosis is difficult due to the absence of any symptoms on account of the cysts small size and their location in the depths of the organ. The current state in solving this problem is based on the WHO classification developed by the informal working group WHO-IWGE in 2003 on the basis of GharbiH.A. classification [1,5]. Its essence lies in the fact that, based on the echographic image of echinococcal cysts, a five stages parasite development classification has been developed.

Currently, in practical medicine, much attention is paid to the diagnosis and treatment of liver echinococcosis. The main highly informative methods for diagnosing echinococcal cysts of the liver are radiation methods (ultrasound, CT, MRI). Ultrasound is a screening method that determines the further tactics of patient management (subject to conservative or surgical treatment)[2,5]. Ultrasound accuracy reaches 90%, but it depends on the class of the device and the experience of the researcher.

Ultrasound reveals small cysts, which allows the patient to undergo conservative treatment with antiparasitic drugs. In addition, echography determines the number of cysts in the liver, the presence of complicated forms of echinococcal cysts (suppuration, breakthrough into the bile ducts, abdominal or pleural cavities), the cysts contents, the presence of a capsule, detachment of the chitinous membrane, the presence of calcifications in the capsule or the contents of the cyst.

The main treatment method of cystic echinococcosis of the liver is surgical. However, this leads to disability of the working-age population. The developed classification made it possible to correct the treatment of this pathology[6].

Due to the asymptomatic course of the disease, cysts are encountered by chance during ultrasound and the imaging results are the basis for the diagnosis of cystic echinococcosis of the liver. Many authors notice that in the presence of calcification in the walls of the cyst, X-ray cystic echinococcosis can be detected in 30% of cases. Calcifications in the form of small hyperechoic inclusions in the contents of the cyst are well visualized on MRI[2,4]. On ultrasound, a calcified capsule is quite well determined, indicating the death of the parasitic cyst [3,5].The most informative for ultrasound are cysts at stages CE2, CE3a and CE3b, since there are pathognomonic signs that are characteristic only for parasitic cysts.

Ultrasoundis “the preferred imaging method due to its availability, lack of radiation and high resolution for diagnostics” as noted by some foreign authors. In addition, the method is widely used in interventional treatment (PAIR). The authors point to the crucial importance of ultrasound in assessing the response to CE treatment, especially in asymptomatic CE4 cysts and CE5 watch-and-wait tactics [4].

The approach to the treatment of CE largely depends on the degree of organ damage, the number of cysts, the presence of cystic-biliary fistulas, etc. as it is noted in the works of foreign authors. Currently, three treatment options are used: conservative, surgical, and percutaneous (minimally invasive). Medical treatment is recommended for inoperable cases (multiple lesions of the lungs, liver and peritoneum) in order to reduce pressure in cysts, the risk of recurrence in preoperative and pre-puncture cases. Contraindications to treatment

**Table 1.**

| Gharbi | WHO-IWGE | Classification signs | Stage |
|---|---|---|---|
| I | CE1 | Hydatid cyst / Simple cyst | Active |
| III | CE2 | Multivesicular cyst with daughter vesicles and septa | Active |
| II | CE3a | Liquid formation with exfoliated chitinous membrane | Transitional |
| III | CE3b | Daughtervesiclesin solid matrix | Transitional |
| IV | CE4 | Heterogeneous matrix cyst without daughter vesicles | Inactive degenerative |
| V | CE5 | Hyperechoic cyst wall | Inactive degenerative |

**Table 2.**

| WHOClassification | Recommended treatment |
|---|---|
| CE1 | d<5cmABZ<br>d>5cm PAIR+ABZ |
| CE2 | Surgery +ABZ or Non-PAIR PT+ABZ |
| CE3a | d<5cm ABZ<br>d>5cm PAIR+ABZ |
| CE3b | surgery +ABZ<br>Non-PAIR PT+ABZ |
| CE4 and CE5 | watching and waiting |

with albendazole are large cysts, calcified cysts, early pregnancy, and liver disease.

Total cystectomy [7] is considered the most radical among the surgical methods. Stages CE4 and CE5 should be "watch and wait" followed by a dynamic ultrasound [3].

The WHO classification is used for diagnosis and treatment selection. Cysts d <5.0 cm (CE1 and CE3a) are treated with ABZ, PAIR + ABZ therapy is recommended for cysts with d> 5.0 cm. ABZ is recommended to be prescribed 4 days before the procedure and 1 month after.

111 patients with primary hepatic echinococcosis were examined by ultrasound and treated, a morphological study was performed in 40 patients operated on echinococcosis at A.N. Syzganov NSCS, in the framework of the STP project from 2017 to 2019. The age of the patients ranged from 18 to 60 years, the average age was 34.2. Ultrasound was performed on the expert class VisionAvius (Hitachi) and Phillips IU 22 devices. According to the WHO classification, the patients were distributed as follows:

- CE 1 - single-chamber cyst with homogeneous contents and a capsule along the periphery - 51 patients;
- CE 2 – on the background of the maternal vesicle, single or multiple daughter cysts with an echogenic contour are determined, which give the cyst the appearance of a "honeycomb" -17 patients;
- CE 3a - on the background of a homogeneous cavity, a chitinous capsule detached along the perimeter is determined (partial or complete detachment) - 11 patients;
- CE 3b - daughter vesicles, fragments of the chitinous membrane and hypoechoic masses filling the space between them are determined on the background of the maternal cyst; There is a small amount of free fluid in the cavity of the cyst; there can be viable protoscolexes in it and on the membranes - 12 patients;
- CE 4 - dead echinococcal cyst, its cavity is filled with a homogeneous echogenic mass, its contours may be uneven due to lack of tension in the cyst, indistinct, with fragments of fibrous capsule along the periphery. A symptom of increased echo signals is observed behind such a cyst, which indicates a thick liquid content of the cyst and can serve as a differential diagnostic sign. All membranes are destroyed, the cyst is a "ball of wool". There are no daughter vesicles - 5 patients.
- CE 5 - dead echinococcal cyst, presented in the form of a calcified arcuate capsule with an intense acoustic shadow behind it. Contains no living protoscolex-3 patients.

CE 1 and CE 2 forms are active, CE3a and CE 3b are intermediate or transitional due to the fact

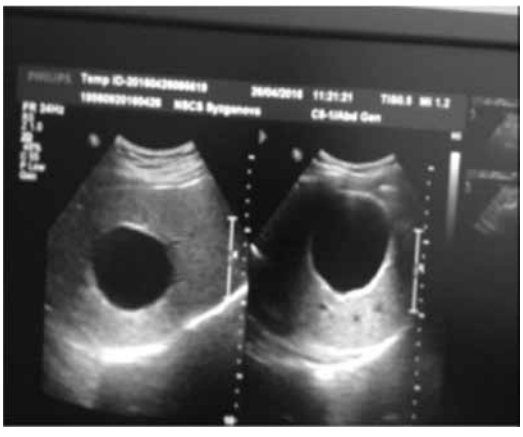

**Fig. 1**
Echinococcal cyst at stage CE1

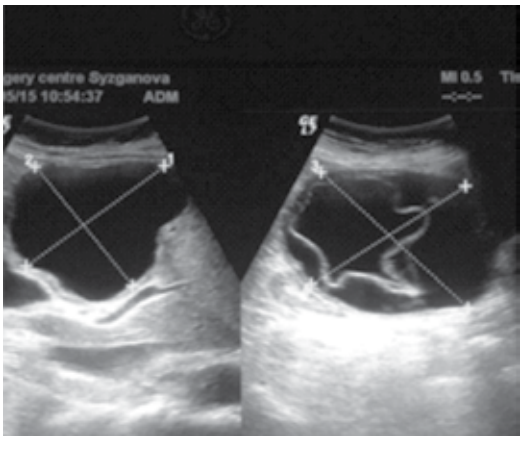

**Fig. 2**
Echinococcal cyst at stage CE3a

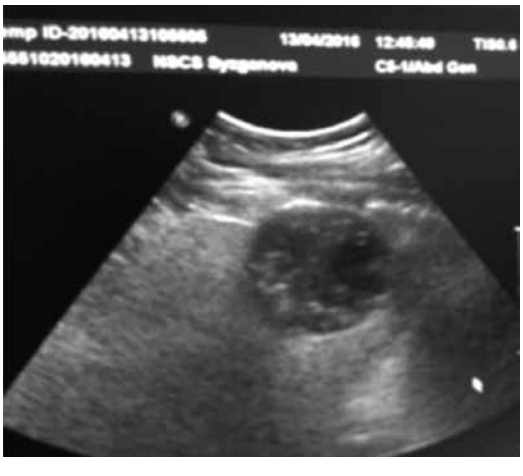

**Fig. 3**
Echinococcal cyst at stage CE4

**Fig. 4**
Echinococcal cyst at stage CE5

that at this stage cysts can organize, shrink, become infected or lead to the appearance of daughter vesicles; CE 4 and CE 5 are inactive, represent a dead parasite.

Pathognomonic symptoms for an echinococcal cyst are daughter vesicles in the contents of the maternal cavity and a detached chitinous membrane, laid in the form of a "water lily". This classification allows to work out the tactics of managing patients with cystic echinococcosis: patients with cysts up to 5.0 cm in size, uncomplicated, single or multiple small, are subject to outpatient observation. Conservative treatment with antiparasitic drugs (albendazole) is carried out for patients with cysts at stages CE1, CE3a, as an initial therapy of CE2 and CE3bforms, with multiple small cysts, with a positive ELISA for echinococcosis and as antirelapse treatment in the postoperative period. With dynamic observation during ultrasound, changes in the structure of the cysts are noted in the form of a decrease in size, uneven contours due to a decrease in tension in the cyst, incomplete or complete detachment of the chitinous membrane, thickening of the cyst contents, the appearance of calcifications in the capsule, which indicates a transition to the CE3- CE4 and a positive response to treatment. Ultrasound for dynamic control was performed in 3-6-12 months. In the absence of changes in cysts and the appearance of complications, the question was decided in favor of surgical treatment. It should be noted that cysts at stages CE4 and CE5 (these are inanimate, inactive) were only subject to dynamic observation for 5 years without albendazole and surgical treatment.

All patients underwent a complete clinicallaboratory and instrumental examination (ultrasound, CT and MRI).

In the ultrasound department, all patients were examined at the preoperative stage with a detailed description of the number of cysts, their localization by segments and lobes of the liver, the size and volume of the cysts, the nature of the contents, the presence of complications (breakthrough into the bile ducts, abdominal or pleural cavity, relation to large vessels). A single echinococcosis was observed in 63 patients (2017 - 18, 2018 - 31, 2019 - 14), multiple - in 28 patients (2017 - 15, 2018 - 6, 2019 - 7). There were no complicated forms of echinococcosis in the examined patients. The stage of echinococcal cysts developmentwas determined by the echographic image. Dynamic control was performed 3-6 days after the operation, 10 days after discharge, after 3-6-12-24 months. The state of the residual cavity was noted, the presence of effusion was determined and then its volume (decrease, increase, suppuration) and other postoperative complications were monitored.

Patients taking conservative treatment with albendazole were examined on an outpatient basis according to the schedule. This group included patients with CE1 stage cystic echinococcosis, the size of which did not exceed 5.0 cm. The cysts were localized in 4-1-2 segments, intimately adjacent to the wall of the gallbladder and the inferior vena cava. There was a transition of cysts at the stages of CE3a and CE4, after three months of taking the drug: marginal or complete detachment of the chitinous membrane was noted in two patients, after 6 months in 3 patients.

In two cases, daughter vesiclesappeared on the background of thick contents (CE3bstage). The size of the cysts tended to decrease in all patients, in single cases - insignificant (5%). After 6 months of observation, most cysts had heterogeneous contents, which contained a thin layer of liquid, a thick component, and fragments of the chitinous membrane. The contours of the cysts became uneven and the volume decreased (15%).After 12 months, the cysts were visualized as echogenic inclusions of small size with small calcifications along the contour and in the structure of the content (20%).

In 1 case of albendazole treatment, toxic liver damage was observed, which was detected by ultrasound in the form of hepatomegaly, a decrease in the echogenicity of the liver parenchyma, therefore the patient was hospitalized for conservative treatment.

Over a analysis period, patients who refused further participation were excluded; due to loss of

**Fig. 5**
Echinococcal cyst after ABZ treatment, marginal detachment of the chitinous membrane is noted

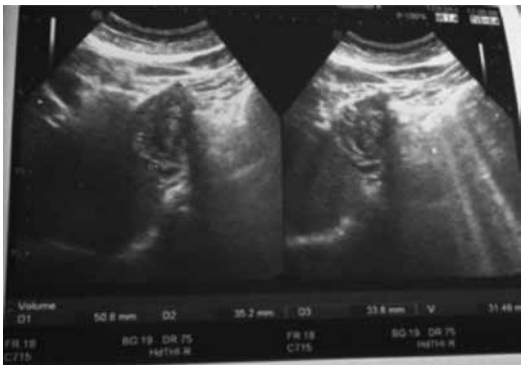

**Fig. 6**
Dead echinococcal cyst after ALB treatment

connection with the patient and due to patients' violation of the treatment and monitoring regimen.

The main tasks of the surgical intervention were radicalism, a decrease in the frequency of postoperative complications and relapses, and the duration of inpatient treatment. Depending on the size and location of the cysts, their number, the presence of complications, clear indications for the use of one or another method of operation were determined. Surgical treatment of echinococcosis includes three methods, depending on the completeness of removal of the fibrous capsule:

1) Removal of the elements of the echinococcal cyst leaving the fibrous capsule of the parasite (echinococcectomy).

2) Removal of the echinococcal cyst together with the fibrous capsule of the parasite (pericystectomy).

3) Removal of the echinococcal cyst by liver resection.

Liver resections are performed for large and multiple cysts that occupy the anatomical lobe of the liver.

In our Center, all patients with cystic echinococcosis were divided into 4 groups depending on the type of treatment performed.

- group 1 - patients who underwent pericystectomy with removal of the capsule and prescription of the antiparasitic drug Zentel (30)
- group 2 - patients who underwent pericystectomy without Zentel prescription (27)
- group 3 - patients who underwent echinococcectomy with leaving the fibrous capsule and prescribing Zentel (27)
- group 4 - patients who received conservative treatment with Zentel (20)

29 patients were observed after pericystectomy + Zentel. The echo picture of the liver was homogeneous in the majority of patients, a residual cavity in the form of an echogenic area of a linear shape was detected in 3 patients. In two cases (6.8%), traces of liquid were observed, which completely resolved during the control study.

Pericystectomy without Zentel administration in the postoperative period was performed in patients with cystic echinococcosis at the stage of large CE1, CE2, CE 3b and CE4. Control ultrasound was performed in 27 patients. After 6 months of observation, an echogenic zone of a linear shape without a liquid component (96.3%) was visualized in the liver tissue, with traces of liquid in 1 patient.

After echinococcectomy with leaving the fibrous capsule + Zentel, ultrasound was performed in 25 patients; after 6 months, 40% of patients underwent ultrasound. Among them 2 patients had an effusion in the subphrenic space (8%), in 5 patients (20%) an effusion was detected in the residual cavity, while in one patient the effusion was of a heterogeneous nature with an admixture of echogenic suspension. In the majority of patients in the postoperative period, the wound surface was unremarkable. During ultrasound, in 1-3 months in 3 cases, the residual cavity was visualized as an echogenic area, single calcifications were determined in its walls. In 1 case, after 3 months of observation, the residual cavity had the appearance of an anechoic formation with pockets of irregular shape. After 6 months, the residual cavity increased in size, echogenic inclusions appeared in the fluid, which was regarded as suppuration. The patient underwent puncture and drainage of the residual cavity under ultrasound control.

Morphological examination of the surgical material

Morphological examination was performed only on operated patients. The total number was 40 patients.

- group 1 (9 patients): echinococtomy with leaving the fibrous capsule
- group 2 (17 patients): pericystectomy + albendazole
- group 3 (14 patients): pericystectomy without albendazole
- group 4: albendazole: no material was taken.

Morphological examination of the fibrous capsule and liver tissue presenting to the fibrous capsule.

Around the emerging echinococcus lavrocyst parasitizing in one organ or another of the intermediate hosta capsule is formed. E.V. Rudin and N.G. Nazarevsky (1981) [10] identified 4 main types of the fibrous capsules structure in echinococcosis, which reflect 4 phases ofcellular immunity development.

A morphological study of intraoperative material taken from 40 patients was carried out to determine the germ elements of the parasite (protoscolexes and acephalocysts) and their viability in the fibrous capsule and liver tissue presenting to the fibrous capsule.

5 cases were referred to the first phase, in the test material there is a pronounced necrosis of the underlying tissue, with a pronounced accumulation of macrophages. In the granulation tissue forming around the parasite, a pronounced macrophage-phage reaction was noted, with an admixture of a large number of lymphoid cells, eosinophils and single plasmacytes. Fibrilogenesis is poorly expressed.

15 cases were considered as the second phase: necrotic changes were moderate, there were single macrophages, rare eosinophilic leukocytes, there was a pronounced lymphoid-cell infiltration, represented by lymphocytes of different sizes and plasma cells. In the granulation tissue, a decrease and hardening of the walls of blood vessels was determined, a large number of epithelioid cells and fibro-

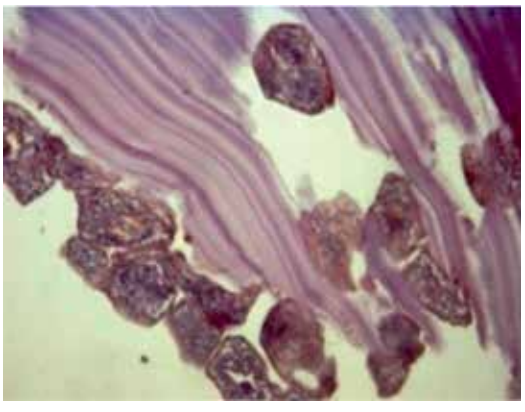

**Fig. 7**
Acephalocysts at different stages of development. HE stain x 100.

blasts located in the form of a "stockade". Excessive growth of coarse fibrous connective tissue with a predominance of collagen fibers was revealed.

5 cases were referred to the third phase, where the chitinous membranes were fragmented with a loss of lamination, coarse fibrous connective tissue with areas of hyalinosis was presented to the laminar membrane of the parasite, and there was focal infiltration on the periphery, mainly by small lymphocytes and plasma cells.

10 cases belonged to the fourth phase: the fibrous capsule was represented by hyalinized coarsely fibrous connective tissue with the presence of scattered single lymphocytes and plasma cells in the outer layers.

Morphological examination of the fibrous capsule showed that the first layer of the capsule, adjacent to the laminar membrane of the parasite, was represented by coarse fibrous connective tissue, the bundles of which were arranged concentrically. In some cases, there were areas of necrosis. The fields of coarse-fibrous connective tissue with pronounced hyalinosis were also noted.

The connective tissue of the second layer was located deeper, which was represented by loose connective tissue with extensive fields of hyalinosis. Small blood vessels were observed between the bundles of collagen fibers. There were groups of hepatocytes embedded in connective tissue fibers.

Groups of hepatocytes located in the fibrous capsule had pronounced signs of dystrophic changes, around them there was a large number of capillary vessels surrounded by lymphoid cells with an admixture of eosinophils.

The third layer of the fibrous capsule was presented to the liver tissue; it was represented by loose connective tissue with the presence of vessels, the walls of which were sharply thickened due to the proliferation of connective tissue, and in places obliterated.

In the first and second layers of the fibrous capsule, degeneratively altered protoscolexes were found, around which scanty round-cell infiltration was noted. In areas of hyalinosis, the elements of the parasite were not identified. In isolated cases, ovoid-shaped protoscolexes surrounded by a clear membrane with deposition of calcium salts were found in the necrotic areas of the capsule.

The liver tissue adjacent to the fibrous capsule was divided into three layers. In the first transitional layer between the fibrous capsule and the parenchyma of the liver, coarse fibrous connective tissue grew, squeezing the hepatocytes. Hepatocytes in this layer were reduced in size, with symptoms of dystrophic changes. Hepatocytes with dense dark cytoplasm and high glycogen content were detected, cells with light cytoplasm without glycogen were foundwhile PAS staining. In the second layer in the liver parenchyma, dilated full-blooded vessels, bile capillaries with sclerosed walls were noted. Hepatocytes had different shapes and were mainly enlarged with hyperchromic nuclei, in which chromatin condensation was noted. Transparent small vacuoles were found in the cytoplasm of the liver cells, and the phenomena of perisinusoidal and pericellular fibrosis were observed. In the third layer in the liver tissue, there was a slight proliferation of connective tissue in the portal tracts and small foci of hypertrophied hepatocytes. This layer contains both light and dark hepatocytes containing a small amount of glycogen.

Thus, the morphological study of the fibrous capsule with the phenomena of necrosis, pronounced macrophage reaction and active collagen formation,

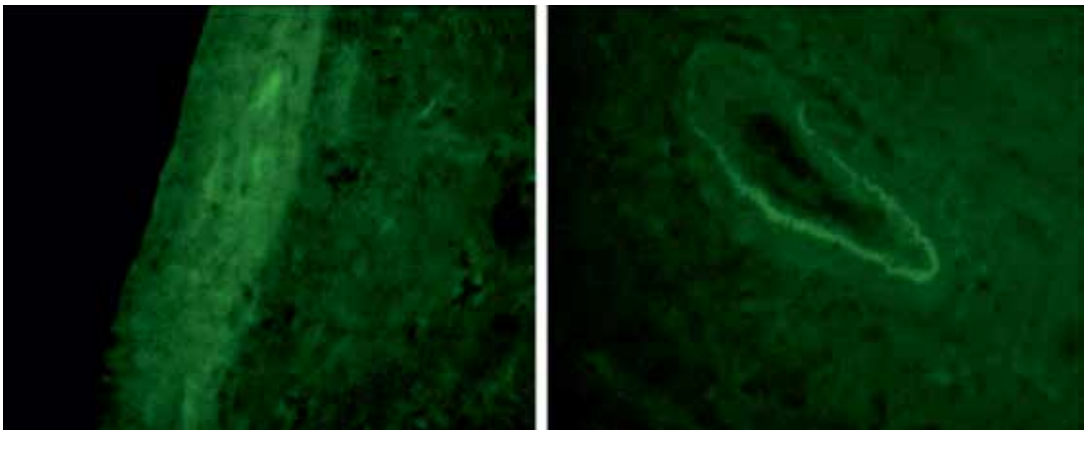

**Fig.8**
IF - study of linear and granular luminescence of IgG +++ in the first / second layers of the fibrous capsule and the vessel wall at the border of the fibrous capsule and liver tissue.

revealed the presence of echinococcus embryonic elements (protoscolex) in the necrotic areas of the fibrous capsule adjacent to the laminar membrane of the parasite. In the study fields, where the growth of coarse-fibrous tissue was noted, degeneratively altered protoscolexes and fragments of the laminar membrane were observed in the fibrous capsule. No parasite elements were found in areas of hyalinosis.

Therefore, the classification of cystic echinococcosis of the liver developed by the WHO working group helped to significantly improve the diagnosis of this pathology and develop tactics for managing this group of patients both in the preoperative and postoperative periods, which significantly improved the results of surgical treatment. A certain group of patients after successful conservative treatment with albendazole did not undergo surgical intervention, which ultimately made it possible to reduce the disability of the working-age population.

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# PREOPERATIVE VOLUMETRY OF THE DONOR'S LIVER IN RELATED LIVER TRANSPLANTATION. REVIEW

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***Abstract***

*With the development of innovative technologies of liver resection and partial transplantation, the intravital assessment of organ volume is of great interest. This review presents the main methods of CT volumetry in the preoperative assessment of donor liver volume, provides an analysis of the available literature data, identifies the advantages and disadvantages of each method.*

**Keywords**
*Computed tomography, transplantation, volume, liver*

## Туыстық трансплантация кезіндегі донордың операция алдылық бауыр волюметриясы. Әдеби шолу

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***Аңдатпа***

*Бауыр резекциясы және парциалды трансплантация кезіндегі инновациялық технологиялардың дамуына байланысты ағзаның көлемін операция алдында бағалау үлкен қызығушылық тудырады. Осы жұмыста донор бауырының көлемін операция алдында бағалау кезіндегі КТ-волюметрияның негізгі әдістері ұсынылды, әдеби деректерге талдау жасалды, әрбір әдістің артықшылықтары мен кемшіліктері анықталды.*

**Түйін сөздер**
*Компьютерлік томография, трансплантация, көлем, бауыр*

## Предоперационная волюметрия печени у донора при родственной трансплантации. Литературный обзор

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***Аннотация***

*С развитием инновационных технологий при резекции печени и парциальной трансплантации прижизненная оценка объема органа представляет большой интерес. В данной работе представлены основные методы КТ-волюметрии в предоперационной оценке объема печени донора, приводится анализ имеющихся литературных данных, определяются преимущества и недостатки каждого метода.*

**Ключевые слова**
*Компьютерная томография, трансплантация, объем, печень*

Liver transplantation in terms of frequency is on the 2nd place in the world after kidney transplantation. According to the WHO, up to 20 thousand liver transplants are performed annually in the world (14.6% of the donor during his lifetime).

Liver transplantation from a related donor has been carried out in Kazakhstan since 2011. As of December 2018, 283 liver transplant procedures were performed at 5 transplant centers in Kazakhstan.

Living donor liver transplantation is an extensive multi-stage surgical procedure that is rightly considered the most difficult in abdominal surgery and in transplantology in general. It includes several stages, such as: preoperative period, surgery and postoperative period [1].

The preoperative period includes calculating the volume of the liver. The main motive behind the search of methods for calculating the volume of the liver is the need to address the issues of spatial

and functional correspondence of the donor liver to the size of the liver bed and liver of the recipient in transplantation. One of the main tasks when examining a donor is to clarify the volume of both the entire liver and its fragment planned for use as a transplant.

Preoperative assessment of donor liver volume is the most important factor influencing surgical strategy and postoperative mortality and morbidity in living donor transplantation. It is important to use no more than 70% of the donor liver volume [2].

To meet the metabolic demands of the recipient, it is necessary to know the standard liver volume, based on anthropometric parameters, and representing the minimum liver volume required for the recipient. The need to accurately determine the standard volume of the liver is due to the goal of avoiding post-transplant syndrome of a small liver [3-8].

Determining the volume of the future hepatic remnant is a fundamental issue in hepatic surgery, since this volume may determine the risk of developing post-hepatectomy liver failure. However, today there is no consensus regarding methods for calculating the volume of the liver, the resected area and the future hepatic remnant [9].

Assessment of liver volume using palpation and percussion methods has disadvantages associated with the reliability and accuracy of the study, especially in obese patients. All over the world, various formulas were used to estimate the standard volume of the liver, which took into account the age, height, sex, body weight of the patient and the maximum diameter of the portal vein [10]. Among the Asian population, the Urata formula is considered the most accurate.

An accurate non-invasive assessment of its volume in an individual can be performed using imaging techniques. Methods for measuring the volume of the liver using imaging methods (CT, MRI, ultrasound) are described. The "gold standard" for determining the size of organs and their volumetry is currently CT and MRI [11-16].

Currently, the preferred means of image-based liver and graft size estimation is computed tomography, which provides detailed information about the liver anatomy, which is important for surgical planning and provides a good correlation between the estimated volume and the resulting graft weight. Yun et al. used the actual graft weight as a reference in living liver donors to determine the accuracy, reproducibility in assessing the graft volume [17].

The calculation of the liver volume is carried out both on the device itself and on the workstation, as well as on special software. In 1970, Heimsfield et al. Were the first to calculate liver volume, and many programs for manual and automatic volume calculation have since been developed [18].

Through the use of thresholds, morphological filtering, feature analysis, area growth, probabilistic models, and conversion factors, these programs provided good estimates of liver volumes over a shorter period of time. In the traditional calculation method, anatomical landmarks are used to calculate liver volume according to Quino's classification 13: The middle hepatic vein is used as a reference for the intersection line of the virtual liver resection, an imaginary plane is drawn between the middle hepatic vein and the fossa of the gallbladder and divided into both hemispheres.

Creation and development of special software of various manufacturers' mills made it possible to simplify, accelerate and improve the volume calculation process. However, each software has its own and weaknesses [19].

Therefore, today there are: manual method at the workstation of a Computer Tomograph, semi-automated (OsiriX-Switzerland; Doctor Liver-South Korea), automated (Voxar 3D-Japan; Syngo.via-Germany; IQQA Liver-China-USA; Synapse Vincent- Japan) [20].

Manual CT volumetry is labor intensive. The main disadvantage is that the doctor spends a lot of time. Moreover, minimizing the error associated with the difference between preoperative presumptive and actual hepatectomy means that volumetry should be performed by a specialist, radiologist or surgeon who is fully aware of the tactics of donor hepatectomy and the possible individual incision of the segment V vein for optimal division of the middle hepatic vein [21].

With manual tracing of the liver contour, large vessels, such as the portal vein or hepatic vein, are well visualized against the background of the parenchyma and can be excluded, but thin branches of the vessels (for example, the branches of the third or fourth order of the portal vein) are not visualized and, accordingly, go to calculation of the volume of the liver.

Automated methods for measuring liver volume using computed tomography can significantly reduce the time required to measure the volume and provide acceptable measurements [22, 23]. Liver vessels, including the portal and hepatic veins, are retrieved from CT images using an automated vessel segmentation technique.

The disadvantage of this method is high cost, and therefore, not all centers can afford to purchase this software.

Despite the variety and development of software for calculating liver volume, there is a tendency to overestimate the liver volume during CT volumetry, both automatic and manual methods, in

comparison with the weight of the right lobe of the liver measured during the operation [24].

Therefore, the results of volumetric measurements often differ from the actual graft weight, which is usually measured during surgery on the backtable, and in most cases the actual graft weight is lower than the calculated one [25].

The reasons for the discrepancy are not fully understood. One of the main reasons for volume error on CT is probably related to the volume of blood circulating in the large vessels of the liver, because the volume of blood is taken into account on CT, whereas the graft weight is usually measured without blood [24]. In this connection, a discrepancy of 10% is considered the norm.

Scientists also calculated and proposed a conversion factor of -1.22 between the mass of the graft without blood and the volume of the graft filled with blood, it is doubtful that such a fixed conversion factor can improve the accuracy of CT volumetry, since there may be individual differences.

Therefore, weight discrepancies and the degree of difference between actual and calculated graft weights have not been analyzed in sufficient detail.

## Conclusion

Preoperative liver assessment is an important step in liver transplantation. Currently, the means for assessing the size of the liver and graft based on images is computed tomography and software developed on its basis: manual, semi-automated and automated. Despite technological developments, there is a tendency to overestimate the liver volume in CT volumetry, both by automatic and manual methods, in comparison with the graft weight measured during the operation. The reasons for the discrepancy are not fully understood and require in-depth study and analysis to avoid intra- and postoperative complications.

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# 10-YEAR EXPERIENCE OF SURGICAL TREATMENT OF GASTROESOPHAGEAL REFLUX DISEASE

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***Abstract***

*Gastroesophageal reflux disease (GERD) is a common pathology among benign diseases of the upper gastrointestinal tract. Lifestyle adjustments and conservative treatments are effective in most patients and are the main treatment for GERD. But despite this, some patients require surgery - antireflux surgery. The article analyzes the results of surgical treatment of patients from 2010 to October 2020 who underwent surgical treatment for GERD in the conditions of the department of surgery of the gastrointestinal tract of the National Scientific Center of Surgery named after A.N. Syzganov.*

**Keywords**
*gastroesophageal reflux disease, Nissen's fundoplication, antireflux surgery, reflux esophagitis*

## Гастроэзофагеяльді рефлюкс ауруын хирургиялық емдеудің 10 жылдық тәжірбиесі

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***Аңдатпа***

*Гастроэзофагеальді рефлюксты ауру (ГЭРА) асқазан-ішек жолдарының жоғарғы бөлігінің кең таралған ауруы ретінде белгілі. Көп науқастарда өмір сүру салтын өзгерту және консервативті емді қолдану ГЭРА-ның негізгі, әрі тиімді емдеу түрі болып саналады. Алайда, кейбір науқастарға хирургиялық ем – антирефлюксті операция қажет. Мақалада 2010 жылдан бастап 2020 жылдың қазан айына дейінгі А.Н. Сызғанов атындағы ҰҒХО-ның асқазан-ішек жолдары хирургиясы бөлімшесінде ГЭРА бойынша ем алған науқастардың хирургиялық емдеу нәтижелері талданған.*

**Түйін сөздер**
*гастроэзофагеальді рефлюксты ауру, Ниссен бойынша фундопликация, антирефлюксты ота, рефлюкс эзофагит*

## 10-летний опыт хирургического лечения гастроэзофагеальной рефлюксной болезни

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***Аннотация***

*Гастроэзофагеальная рефлюксная болезнь (ГЭРБ) является распространенной патологией среди доброкачественных заболеваний верхнего отдела желудочно-кишечного тракта. Коррекция образа жизни и консервативные виды лечения эффективны у большинства пациентов и является основным видом лечения ГЭРБ. Но несмотря на это, некоторым пациентам требуется хирургическое вмешательство - антирефлюксная операция. В статье проанализированы результаты хирургического лечения больныхс 2010 года по октябрь 2020 года, которым было проведено оперативное лечение по поводу ГЭРБ в условиях отдела хирургии желудочно-кишечного тракта Национального научного центра хирургии им. А.Н. Сызганова.*

**Ключевые слова**
*гастроэзофагеальная рефлюксная болезнь, фундопликация по Ниссену, антирефлюксная хирургия, рефлюкс эзофагит*

## Introduction

According to the WHO classification, GERD is a chronic recurrent disease characterized by reflux into the esophagus of gastric or duodenal contents resulting from disturbances in the motor-evacuation function of the esophagogastroduodenal zone, which are manifested by symptoms that disturb the patient and the development of complications [1].

The high prevalence of this disease among the working-age population is one of the reasons for the decline in the quality of human resources, and this makes the topic relevant not only in the health care system, but also in the socio-economic sphere. The frequency of GERD symptoms among the adult population of Europe is in the range of 8.8-25.9%, North and South America is in the range of 18.1-27.8% and 23%, respectively, and according to scientists from East Asia, this figure reaches from 8, 7 to 33.1% [3].

Reflux of acidic contents of the stomach and duodenum leads to symptoms of GERD: heartburn, belching, cough, dysphagia, etc. There are also complications of GERD, such as erosive esophagitis, bleeding, peptic ulcers of the esophagus, peptic strictures of the esophagus, Barrett's esophagus and esophageal carcinoma [2]. At the present stage of development of medicine, GERD is a multifactorial pathology that requires an integrated approach to prevention and treatment. Conservative treatment is aimed at eliminating the symptoms of GERD, as well as preventing and treating complications and improving the patient's quality of life [3].

With the ineffectiveness of drug therapy, as well as with complicated forms of GERD, surgical intervention is indicated. In the recommendations of SAGES (Society of American Gastrointestinal and Endoscopic Surgeons), the "gold standard" of surgical treatment of GERD is laparoscopic fundoplication according to Nissen and Toupe. However, this operation has its drawbacks, and basically the success of the performed operation depends on the qualifications and skills of the surgeon and technical equipment [2,4,5].

In the literature, many complications of the primary operation are described. The most common complications were the migration of the fundoplication wrap into the mediastinum (from 18.8% to 30%) [6] and the formation of a paraesophageal hernia (6.7%) [7]. Thus, despite the significant progress made in recent years in the development of new minimally invasive methods for correcting GERD, there are many unresolved problems, one of which is the creation of an optimal fundoplication wrap when performing laparoscopic fundoplication.

## Purpose

Comparative analysis of the clinical outcomes of laparoscopic and open Nissen fundoplication of adult.

## Materials and methods

The study is based on a retro- and prospective analysis of the case histories of patients who underwent surgical treatment for GERD on the basis of the Department of Gastrointestinal Surgery of the National Scientific Center for Surgery named after A.N. Syzganov. An analysis of the case histories of 340 patients from 2010 to October 2020 was carried out, the study involved 124 (36.4%) men, 216 (63.6%) women aged 19 to 84 years. The main type of surgical correction of GERD was total (circular) Nissen fundoplication.

The introduction of minimally invasive technologies into surgical practice has increased the number of laparoscopic antireflux operations. The trend in the choice of surgical access is shown in the diagram (Figure 1).

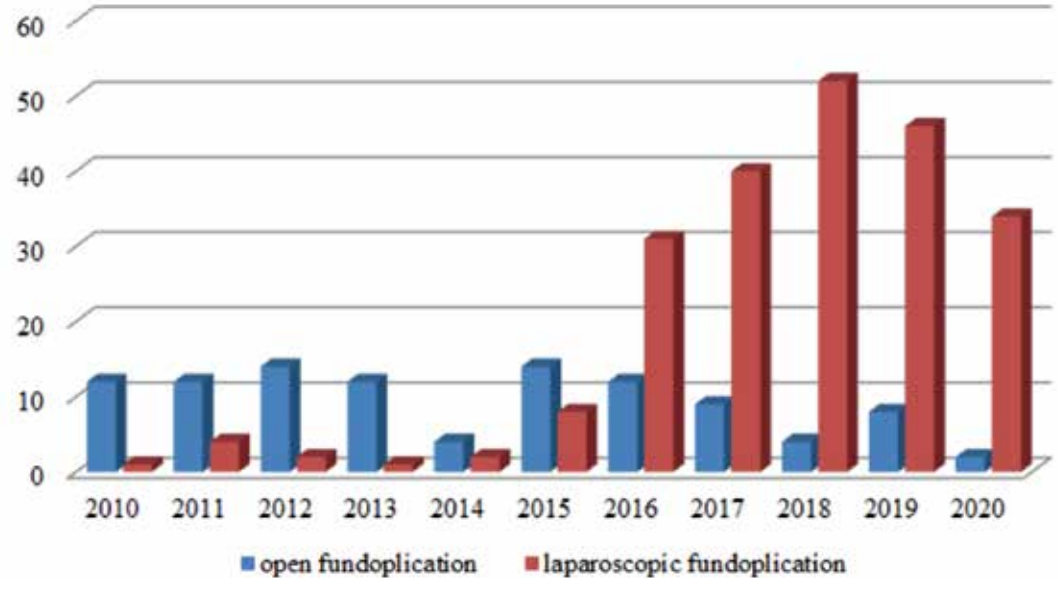


**Figure 1.**
Trends in the choice of surgical access

**Table 1.**
The distribution of patients among groups by diagnosis

| Diagnosis | Controle group (n=118) | | Main group (n=222) | | Total (n=340) | | p |
|---|---|---|---|---|---|---|---|
| | Abs. | % | Abs. | % | Abs. | % | |
| GERD with hiatal hernia | 95 | 80,5 | 193 | 86,9 | 288 | 84,8 | p>0.05 |
| GERD with esophageal stenosis | 13 | 11,1 | 16 | 7,3 | 29 | 8,5 | p>0.05 |
| Barret's esophagus | 3 | 2,5 | 8 | 3,6 | 11 | 3,2 | p>0.05 |
| Peptic esophagitis | 7 | 5,9 | 5 | 2,2 | 12 | 3,5 | p>0.05 |
| **Total** | **118** | **100,0** | **222** | **100,0** | **340** | **100,0** | |

The control group consisted of 118 patients who underwent traditional types of interventions. Also in this group were included patients (5 cases), reoperated for relapse after various types of antireflux surgery.

The main group consisted of the remaining 222 patients who underwent fundoplication with laparoscopic access (data are presented below - table 1).

Patient complaints were consistent with the clinical manifestations of GERD. Heartburn, being the main symptom of GERD, according to our data, was detected in 84 (71.2%) patients in the control group and in 189 (85.5%) patients in the main group. Pain syndrome of varying intensity in the epigastrium and behind the sternum was experienced by 91 (77.1%) and 129 (58.1%) patients of the control and main groups, respectively. Most of the observed pain syndrome occurred during the period of heartburn. Also, the frequent complaints of patients were discomfort and heaviness in the epigastric region. A feeling of discomfort was experienced by 80 (67.8%) patients in the control group and 182 (81.9%) patients in the main group. Severity in the epigastricregion was observed in 48 (40.6%) patients of the control group, in the main group - 154 (69.3%) patients. The ratio of the remaining symptoms is indicated in the diagram (Figure 2).

In the preoperative period, all patients of both groups underwent examination, including the collection of complaints and anamnesis data, physical examination methods, clinical laboratory studies, instrumental studies. To assess the state of the upper gastrointestinal tract, mainly polypositional X-ray contrast and endoscopic studies of the esophagus and stomach were carried out.

According to the results of an endoscopic study (classification of Savary-Miller, 1978), GERD of the I degree was detected in 82 (24.2%) patients, II - 158 (46.5%) patients, III - 61 (17.9%) patients , IV - 39 (11.4%) patients (figure 3). Hiatal hernia of varying degrees was detected in 287 (84.4%) patients (figure 4).

Indications for surgical treatment were: 1) the ineffectiveness of complex conservative therapy; 2) a combination of pronounced manifestations of GERD with hernias of the esophageal opening of the diaphragm of any size; 3) the presence of extra-esophageal manifestations of GERD - cardiac, bronchopulmonary and others .; 4) the presence of complicated forms of GERD (Barrett's esophagus, peptic ulcers of the esophagus, esophageal stenosis); 5) the presence of concomitant surgical pathology (gallbladder stones, gastric ulcer and duodenal ulcer, hernias of the anterior abdominal wall).

## Results and discussion

All patients of the main group (n = 222) were performed laparoscopic Nissen fundoplication. Of

**Figure 2.**
Distribution of GERD symptoms in patients of both groups

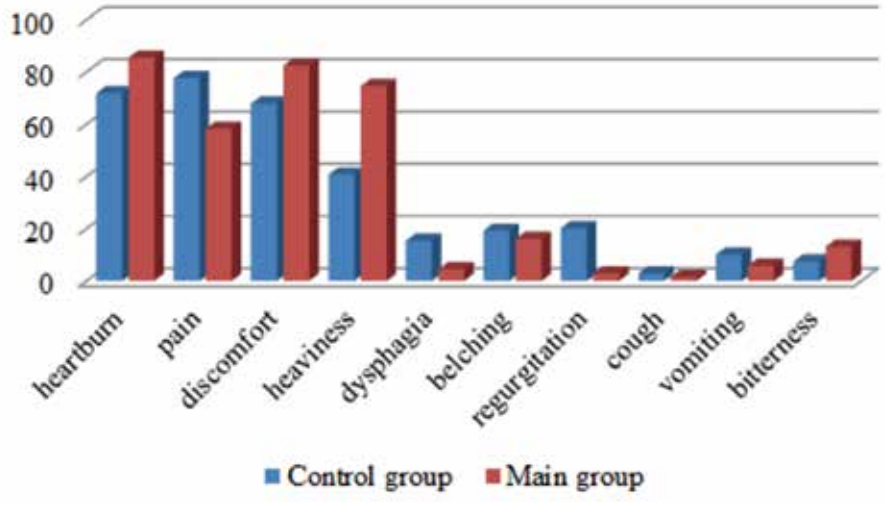

**Figure 3.**
Endoscopic picture of GERD

**Figure 4.**
X-ray examination of hiatal hernia

these, 3 (%) patients who had stenotic esophagitis in the preoperative period underwent endoscopic bougienage of esophagus. When performing laparoscopic fundoplication, a calibration catheter with a diameter of 36 Fr (12.0 mm) was used to form the cuff.

The results of surgical treatment of all 340 patients were analyzed. The average duration of surgery was 119.04 ± 46.82 and 136.34 ± 52.01 minutes in the control and main groups, respectively. At the stage of accumulating experience and mastering the laparoscopic technique, the operation lasted up to 3.5 hours. Over time, the minimum duration of surgery was 60 minutes. All patients were activated on the 1st day after the operation and were led according to the technology of accelerated rehabilitation. For the control group, the average postoperative bed-day was 9.79 ± 4.42 days, for the main group - 6.3 ± 3.16 days.

In patients of the control group who underwent open fundoplication, intraoperative complications were observed in 4 (3.3%) patients. Of these, spleen decapsulation was in 3 cases, which required splenectomy. In 1 patient, the mediastinal pleura was opened, in connection with this, the pleural defect was sutured and an additional drainage tube was installed in the pleural cavity. In 3 (1.3%) cases of the main group, complications were observed in the postoperative period. In the first case, the patient on the third day after the operation developed left-sided lower lobe pneumonia. Conducted a comprehensive conservative, antibacterial therapy, against which the patient's condition improved. 1 patient developed exudative pleurisy, pleural cavity drainage was performed, as well as antibiotic treatment, as a result of which the patient was discharged with improvement. Dysphagia appeared in 1 patient, which was eliminated by two sessions bougienage of esophagus.

Intraoperative complications were observed in 3 (1.3%) cases of the main group. Of these, in 2 cases, the mediastinal pleura was damaged, which was complicated by intraoperative pneumothorax. The pleural defect was sutured, drainage tubes were installed in the pleural cavity. In 1 case, with the introduction of the calibration probe, perforation of the abdominal segment of the esophagus occurred, and therefore a conversion was performed. The perforation hole was sutured with a 2-row seam, in addition, the seam area was covered with a fundoplication cuff. In 2 (0.9%) patients of the main group, in the early postoperative period, a clinic of dysphagia was observed, which was eliminated with one session of pneumodilatation.

With Barrett's esophagus, 11 patients (3.2%) in both groups underwent Nissen fundoplication. In the postoperative period, all patients with Barrett's esophagus were prescribed continuous antisecretory therapy with proton pump inhibitors.

There were no fatal outcomes in the intra-, postoperative period in our observations.

Long-term results of surgical treatment were studied in patients included in the period from 2 to 24 months or more. 126 patients who were operated on in the period 2015-2020 were available for the assessment. Of these, 17 (13.5%) patients in

the control group and 109 (86.5%) patients in the main group. The GERD-HRQL questionnaire was used to assess the effectiveness of fundoplication. This questionnaire allows you to determine the complaints of patients after undergoing antireflux surgery.

When studying long-term results, positive results of the intervention, in the form of the disappearance of symptoms of gastroesophageal reflux, were noted by 104 (88.1%) patients in the control group and 209 (94.1%) patients in the main group. GERD recurrence was observed in 2 patients: 1 case after open and 1 case after laparoscopic correction of hiatal hernia. Both patients underwent open Nissen refundoplication.

## Conclusion

Nissen laparoscopic fundoplication remains the "gold standard" and is the operation of choice in antireflux surgery in the treatment of patients with GERD. Compared with open interventions, it allows to reduce the patient's hospital stay and significantly improve the quality of life of patients in the long-term period. This technology allows without the expansion of operational access to successfully perform simultaneous operations on the abdominal organs.

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# GIANT LIPOMA OF THE HAND. CASE REPORT

МРНТИ 76.29.41

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***Abstract***

*A 39-year-old man presented with a large mass on her left hand that was progressively enlarging over a period of a few years. He had pain syndrome, cosmetic concerns about the enlarging mass, and experienced interference with routine activity. Physical examination revealed a soft, mobile, non-tender, lobulated mass with well-defined margins. Ultrasound diagnostic showed the soft lump to be a lipomatous mass in the deep palmar space of the hand, which was subsequently surgically resected. The imaging features of deep palmar lipomas of the hand and other common benign lesions at this location are discussed.*

**Keywords**
*giant lipoma, nerve compression, pain syndrome*

## Қол буынындағы үлкен липома. Практикадағы жағдай

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***Аңдатпа***

*39 жастағы ер адам бірнеше жыл бойы бірте-бірте өсіп келе жатқан, сол қолындағы үлкен жаңа өсінді жөніндегі шағымымен бізге жүгінді. Физикалық қарап-тексеру кезінде жұмсақ, қозғалмалы, ауырмайтын, шеттері айқын көрінетін бөлікшелі масса анықталды. Ультрадыбыстық диагностика қол буынындағы алақан кеңістігінің тереңінде орналасқан липоманы көрсетті, кейіннен ол хирургиялық жолмен алынып тасталды. Қол буынындағы алақанның тереңінде орналасқан липомаларды визуализациялау ерекшеліктері талқыланды және бұл жерде басқа қатерсіз жаңа өсінділер анықталған жоқ.*

**Түйін сөздер**
*үлкен липома, жүйке компрессиясы, ауырсыну синдромы*

## Гигантская липома кисти. Случай из практики

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***Аннотация***

*39-летний мужчина обратился с жалобой на большое образование на левой руке, которое постепенно увеличивалось в течение нескольких лет. Физикальное обследование выявило мягкую, подвижную, безболезненную, дольчатую массу с четко определенными краями. Ультразвуковая диагностика показала, что образование представляет собой липому в глубоком ладонном пространстве кисти, которое впоследствии было удалено хирургическим путем. Обсуждаются особенности визуализации глубоких ладонных липом кисти и других распространенных доброкачественных образований в этом месте.*

**Ключевые слова**
*гигантская липома, компрессия нерва, болевой синдром*

## Introduction

One of the most common soft tissue tumors of the our body - lipoma [1], but it is extremely rare in the hand [2], where it represents the 8% of benign tumors [3].

Giant lipoma sizing ≥5 sm should be removed due to the possibility of malignant transformation to sarcoma, despite the rare occurrence in the hand [4,5]. This pathology in the Kazakh population is observed for the first time.

We present a case report of a giant lipoma with pain syndrome of the deep palmar and dorsal space of the hand that was removed en bloc through a microsurgical technique.

## Case report

The informed consent was obtained from the patient involved in this study according to the Institutional Review Board and all procedures were in accordance with the institutional and national ethical standards.

The patient was a seamstress, 39 -year-old,Kazakh male with a past medical history of alcohol addiction, hyperbilirubinemia,hyperlipidemia and chronic gastritis.

The man had a more than 5-year history of slow increasing painless mass involving both the dorsal and volar aspects of his left non-dominant hand. In 2015, he initially noticed the swelling in the central area of the palm, and then progressively enlarged in dimensions over a period of 5 years, the last 2 months noted pain syndrome.


**Figure 1.** Longitudinal echographic picture of a tumorformation of the palmar surface of the left hand

**Figure 2.** Giant lipoma of the left hand

On physical examination: On the palmar surface of the left hand is a tumor formation. Size 5.5 * 4.1 cm. On palpation - mild soreness. Hypesthesia of the III, IV, V fingers of the left hand.

The surgical indication was given on the basis of the recent growth of the mass and on the patient's concerns upon the worsening of neurovascular symptoms or developing malignant transformation of the mass.

Ultrasound examination (Figure 1.) was determinedrounded formation, in the area of hypotenar, homogeneousstructure, moderately increased echogenicity, characteristic

for adipose tissue, with clear, even contours, size5.1x4.2cm, avascular. The flexor tendons of the 5th finger are located above it.Preliminary diagnosis – lipoma.

**Surgical procedure**

The surgery was carried out under axillary block and by tourniquet hemostasis. After preliminary marking, as well as using a binocular magnifier with a magnification of 3.5x, the skin and underlying tissues are opened along the distal palm line. During the audit: lipoma 5 * 4 cm in size(Figure 2). Finger branches of the median and ulnar nerve are compressed throughout - nerve block is performed with a solution of 0.25% novocaine. Thorough hemostasis, drainage, sutures.

**Histopathology and post-operative course**

Histopathology reported a well-encapsulated tumor composed of mature adipose cells consistent with a benign lipoma.The pain was stopped. Re-growth of lipoma was not observed.

## Discussion

Lipomas larger than 5 cm are called giant lipomas [6], as in the case presented. Lipomas usually grow very slowly, and the etiology of rapid growth in giant lipomas is debatable. It is suggested that blunt trauma can lead to rupture of the fibrous septum between the skin and the deep fascia, contributing to the growth of adipose tissue. There was no apparent relationship between tumor volume and patient symptoms. [7] Ridholm and Berg in a retrospective study of 428 cases of musculoskeletal lipomas found that the frequency of a single lipoma to sarcoma was 150/1 for lesions ≤ 5 cm and 20/1 for lesions> 5 cm. [8] Therefore, patients should be informed that giant lipomas have an increased risk of developing malignant neoplasms.

History and clinical examination are usually sufficient to diagnose superficial lipomas if you use microsurgical technique. To date, there is no literature data on the prevalence of this pathology among the Kazakh population.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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# ASSESSMENT OF THE SAFETY AND CLINICAL EFFICACY OF THE PAINKILLER RUBUFIN IN SURGICAL PATIENTS IN THE POSTOPERATIVE PERIOD

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***Abstract***

*Rubufin was applied in patients of the National Scientific Center of Surgery named after A.N. Syzganov in the postoperative period. Studied 150 patients aged 22 to 65 years. The effectiveness of anesthesia was assessed by changing the following criteria: blood pressure, pulse, heart rate, oxygen saturation in peripheral blood, gas composition and acid-base state of the blood, and a visual analogue pain rating scale. The effect of rubufin on changes in blood biochemical parameters was studied. A decrease in pain syndrome was revealed by 1.5 times, a decrease in heart rate from 95.6 ± 8.8 to 83.2 ± 11.7 per minute, and respiratory rate from 22.4 ± 2.7 to 16.3 ± 2.1 in minute, a decrease in mean arterial pressure is proportional to a decrease in pain, absence of respiratory depression, an increase in oxygen tension in the blood from 109.5 ± 23.4 mm Hg. up to 112.4 ± 16.6 mm Hg, no changes in blood biochemical parameters when using rubufin. Thus, it has been proven to be highly effective in anesthetizing patients with moderate and severe pain syndrome after extensive surgical interventions, and to improve the indicators of blood oxygenation and stroke volume associated with the elimination of pain syndrome.*

**Keywords**
*postoperative pain, opioid receptor antagonist-agonists, analgesia efficacy*

**Хирургиялық науқастарда отадан кейінгі кезеңде «Рубуфин» дәрілік препаратының қауіпсіздігін және клиникалық тиімділігін бағалау**

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***Аңдатпа***

*Рубуфин перепараты А.Н. Сызганов атындағы Ұлттық ғылыми хирургия орталығын отадан кейінгі кезеңіндегі науқастарда қолданылды. 22-55 жас аралығындағы150 науқас зерттелді.*

*Ауырсыздандыру тиімділігін келесі көрсеткіштер бойынша бағаланды: артериялдық қан қысымы, тамырсоғу жиілігі, жүрек жиырылу жиілігі, перифериялық қандағы оттегінің сатурациясы, қанның қышқылды-сілтілі жағдайы және газдық құрамы, ауырсынуды бағалаудың визуалды-аналогтық шкаласы. Сонымен қатар, Рубуфин препаратының қанның биохимиялық көрсеткіштерінің өзгерісіне әсерін зерттелінді.*

*Рубуфинді қолдану кезінде ауырсыну синдромы 1,5 есеге азаюы, жүрек жиырылу жиілігі минутына 95,6±8,8-ден 83,2±11,7-гедейін кемуі, тыныс алу жиілігінің минутына 22,4±2,7-ден 16,3±2,1-ге дейін төмендеуі,орташа артерияды қан қысымының ауырсыну синдромының азаюына пропорционалды төмендеуі, тыныс депрессиясының болмауы, қандағы оттегінің кернеуінің 109,5±23,4 мм.сын.бағ.-нан 112,4±16,6 мм.сын.бағ.-дейін артуы анықталды. Рубуфинді қолдану кезінде қанның биохимиялыққөрс еткіштеріндеөзгерістер байқалмады.*

*Осылайша, ауқымды хирургиялық араласулардан кейін орташа және айқын ауырсыну синдромы бар пациенттерді ауырсыздандыру кезінде жоғары тиімділігі және ауырсыну синдромын жоюға байланысты қанның оксигенациясы мен жүректің соғу көлемінің жақсаруы дәлелденді.*

**Түйін сөздер**
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# Оценка безопасности и клинической эффективности лекарственного препарата «Рубуфин» у хирургических больных в послеоперационном периоде

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***Аннотация***

*Препарат рубуфин применяли у пациентов Национального научного центра хирургии им. А.Н. Сызганова в послеоперационном периоде. Исследовано 150 пациентов в возрасте от 22 до 65 лет.*

*Оценивали эффективность обезболивания по изменению следующих критериев: артериальное давление, пульс, частота сердечных сокращений, сатурация кислорода в периферической крови, газовый состав и кислотно-основное состояние крови и визуально-аналоговая шкала оценки боли. Исследовали влияние рубуфина на изменение биохимических показателей крови.*

*Выявлено уменьшение болевого синдрома в1,5 раза, урежение частоты сердечных сокращений с 95,6±8,8 до 83,2±11,7 в минуту, частоты дыхания с22,4±2,7 до 16,3±2,1 в минуту, снижение среднего артериального давления пропорционально уменьшению болевого синдрома , отсутствие угнетения дыхания, увеличение напряжения кислорода в крови со 109,5±23,4 мм рт.ст. до112,4±16,6 мм рт.ст., отсутствие изменений биохимических показателей крови при применении рубуфина.*

*Таким образом, доказана высокая эффективность при обезболивании пациентов с умеренным и сильным болевым синдромом после обширных оперативных вмешательствах, и улучшение показателей оксигенации крови и ударного объема связанные с устранением болевого синдрома.*

**Ключевые слова**
*послеоперационная боль, агонисты-антагонисты опиоидных рецепторов, эффективность аналгезии*

## Backround

All surgical interventions are accompanied by pain syndrome, expressed to one degree or another [1]. Pain causes not only psychological changes in patients, but pronounced dysfunctions of various systems and organs [2]. These changes adversely affect the outcome of the disease, prolong the patient's stay in the hospital and significantly increase the material costs of treatment [7]. Therefore, the pain syndrome must be significantly reduced or eliminated altogether in the postoperative period. Rubufin belongs to opioid analgesics - agonists-antagonists of opioid receptors, which is simultaneously devoid of many side effects of narcotic analgesics (respiratory depression, paresis of the gastrointestinal tract), but is not inferior to them in terms of the strength of the analgesic effect [3-6]. Therefore, its use is indicated in patients in the postoperative period, when non-narcotic analgesics in most cases are ineffective, and the use of full agonists of opiate receptors is limited due to the risk of severe side effects [8].

The aim of this study was a clinical assessment of effectiveness of analgesia with rubufin in patients with moderate to severe postoperative pain.

## Methods

Rubufin was used in one group of 150 patients from the National Scientific Center for Surgery named after A.N. Syzganov in the postoperative period.

To assess the effectiveness of analgesia, the following indicators were determined: blood pressure (systolic, diastolic, mean), pulse, heart rate, oxygen saturation in peripheral blood, gas composition and acid-base state of blood, and a visual analogue scale for assessing pain. On this scale, the level of pain is assessed from 0 points - no pain, to 10 - very severe pain; pain syndrome was assessed at rest and during movement. After the patients received rubufin, the time of the onset of the effect, the duration of effective analgesia, and the amount of the drug that had to be used to achieve effective analgesia were studied.

Hemodynamic parameters (blood pressure, pulse, heart rate) were determined using a NihonKohden monitor.

Determination of blood gas, electrolyte composition and acid-base state was carried out with an ABL 800 analyzer (Radiometer).

Blood biochemical parameters were determined with an A15 analyzer (BioSystems).

Coagulogram parameters were determined with a CA-1500 analyzer (Sysmex).

To the data obtained during the study, in addition to descriptive methods, the corresponding statistical comparison methods were applied. Paired t-test and Wilcoxon rank sum test were used for quantitative data. For categorical values, the chi-square test was applied. Additionally, Spearman's correlation coefficient was

determined. The data obtained were processed using the statistical functions of the EXEL 2010 program.

The selected efficacy indicators were determined in the studied patients at several conditional stages (visits) of the postoperative period. Baseline (Stage 1) values were measured before surgery. Stage 2 - after the patient wakes up in the postoperative period. Stage 3 - one hour after rubufin application. If it was necessary to reapply rubufin to achieve effective analgesia, Visit 3 was one hour after re-administration. Stage 4 - 1 postoperative day before using the drug. Stage 5 - one hour after rubufin application on the first postoperative day. Stage 6 and 7, respectively, before and after rubufin application on the 2nd postoperative day. Long-term effects of the drug have not been studied.

## Results

The study involved 150 patients aged 19 to 73 years, the average age was 48.3 ± 14.2 years. Men - 18, women - 14.

5 patients underwent gastrectomy, 4 patients - hemihepatectomy, 5 patients - esophageal plastic surgery, 2 patients - gastropancreatoduodenal resection, 6 patients - gastric resection, 10 patients - cholecystectomy. The nature of the surgical pathology is presented in Table 1.

The physical status of the patients corresponded to ASA class II-IV.

Rubufin was used intramuscularly in 11 patients and intravenously in 21 patients.

**Evaluation of the effectiveness**

Changes in the studied parameters are expressed as M ± δ and are presented in tables and figures.

When using rubufin, the following side effects were observed: in three cases (9.4%) severe sweating, in 6 cases (18.8%) nausea, in 3 cases (9.4%) dizziness, drowsiness was observed in 18 cases (56.3%). No serious side effects were observed. The vast majority of side effects were observed in patients with intravenous administration of the drug. When using the drug intramuscularly, the analgesic effect occurred in 48.7 ± 5.4 minutes, with intravenous administration - after 16.3 ± 7.2 minutes ($p < 0.05$). It was also revealed that with the first administration of the drug, the effect occurred after 26.3 ± 13.5 minutes, and with the repeated administration after 13.4 ± 8.2 minutes ($p < 0.05$). The duration of effective analgesia increased with repeated use of rubufin: 272.8 ± 65.3 minutes after the first injection and 487.5 ± 99.6 minutes after the second ($p < 0.05$).

The amount of the drug required for effective analgesia decreased upon repeated injection from 17.7 ± 4.4 mg to 12.3 ± 2.6 mg, respectively ($p < 0.05$).

Studied parameters and its changes highlighted in table 2.

The level of pain syndrome and stress index were significantly increased at the second stage, after the application of rubufin they decreased (Figure 1, 2). At the same time, a high degree of correlation between the level of pain syndrome and the index of myocardial tension r = 0.83 was revealed. The study of hemodynamics of patients showed an increase in blood pressure and heart rate at the second stage of the study, which is associated with an increase in pain. After the application of rubufin, the indicators approached the initial ones (Figure 3). In addition, as the pain syndrome increased, the patients showed a decrease in

**Table 1.** Surgical pathology in studied patients

| Diagnosis | Amount | % |
|---|---|---|
| Gastric cancer | 5 | 15,63 |
| Esophageal cancer | 2 | 6,25 |
| Liver cancer | 4 | 12,5 |
| Esophageal cicatricial stenosis | 3 | 9,37 |
| Pancreatic cancer | 2 | 6,25 |
| Gastric /duodenal ulcer | 6 | 18,75 |
| Cholelythiasis | 10 | 31,25 |
| **Total** | **32** | **100** |

**Table2.** Hemodynamics parameters and severity of postoperative pan in studied patients

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

| Parameter / Stage | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| APsys (mm Hg) | 125,4±38,2 | 137, 6±22,7* | 132,2±36,4*¤ | 122,3±35,8¤ | 124,6±34,6 |
| APdia (mm Hg) | 66,8±31,7 | 69,6±33,2* | 71,4±28,6 | 78,3±22,2¤ | 69,1±15,5¤ |
| APmean (mm Hg) | | | | | |
| HR ($min^{-1}$) | 88,4±15,3 | 95,6±8,8* | 83,2±11,7*¤ | 76,3±18,2*¤ | 71,1±10,3*¤ |
| CO (l/min) | 5,3±1,1 | 4,8±2,8 | 5,1±2,2¤ | 4,3±3,1*¤ | 4,7±1,2¤ |
| SV (ml) | 64,1±3,8 | 50,2±8,6* | 61,3±7,7¤ | 56,4±7,2*¤ | 66,1±6,3¤ |
| Stress Index (U) | 119,3±32,2 | 236,6±18,6* | 127,8±28,8¤ | 98,6±22,6*¤ | 83,2±19,6¤ |
| VAS (score) | 1,8±0,8 | 3,7±1,2* | 2,1±0,9¤ | 2,3±1,1* | 1,5±1,3¤ |

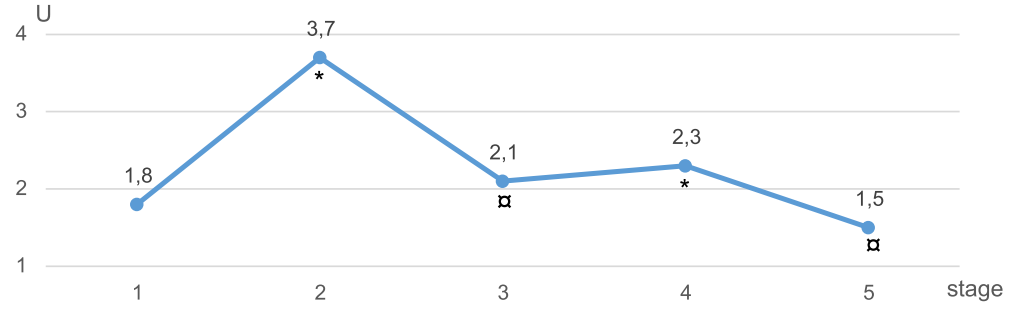


**Figure 1.**
Visual analog scale for pain in studied patients

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

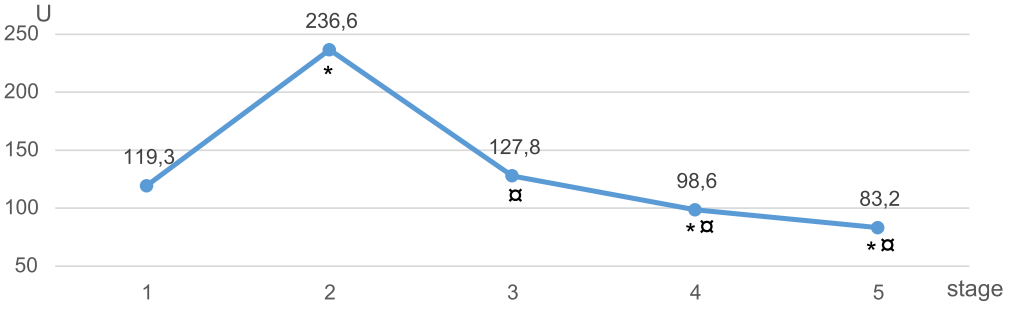


**Figure 2.**
Stress index in studied patients

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

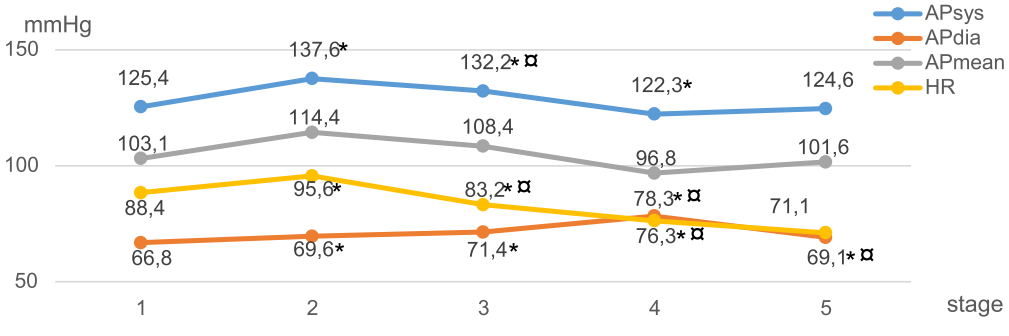


**Figure 3.**
Hemodynamics parameters in studied patients

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

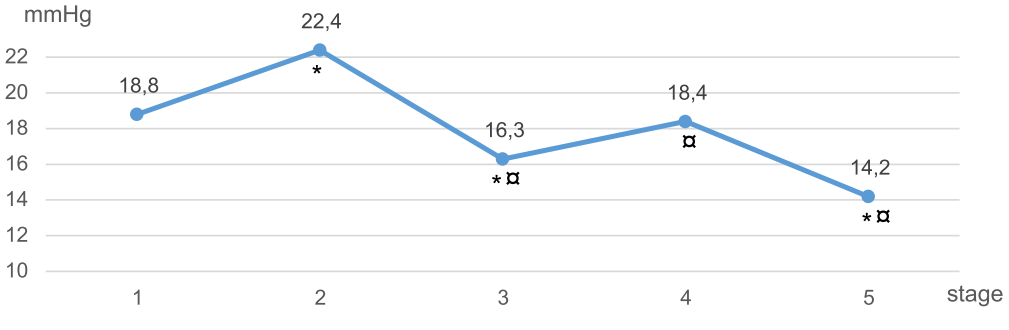


**Figure 4.**
Respiratory rate in studied patients.

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

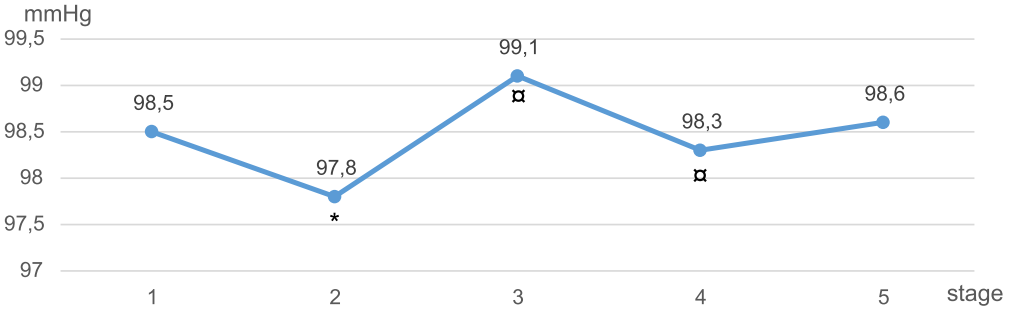


**Figure 5.**
Blood oxygen saturation in studied patients.

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

cardiac output and stroke volume, which increased after anesthesia (Figure 4, 5).

A change in the respiratory rate towards an increase occurred with an increase in the pain syndrome - at the second stage, after anesthesia with rubufin, a decrease in the respiratory rate occurred (Figure 6), however, there was no depression, as evidenced by the gas exchange indices. Blood oxygenation against the background of oxygen inhalation was satisfactory at all stages of the study, but increased after patients were given the painkiller (Figure 7).

The oxygen partial pressure decreased towards the end of the study, which is associated with the cessation of oxygen inhalation. However, with an increase in pain, a slight decrease in oxygen tension in the blood was noted, but after pain was relieved (stage 3), pO2 increases (Figure 8). The correlation dependence of the oxygen partial pressure with blood saturation r = 0.63.

The partial pressure of carbon dioxide in the blood changed in accordance with the change in the respiratory rate – with an increase in RR, the pressure of CO2 in the blood decreased and vice versa (Figure 9).

Changes in blood pH and base deficiency were within the normal range and did not depend on the increase or decrease in pain syndrome. Changes in these indicators, apparently, were caused by therapy aimed at correcting the initial violations of the acid-base state (table 3).

Metabolism in patients was assessed by the change in the parameters of the biochemical blood test, the data are shown in Table 4. all indicators did not undergo significant changes, remaining within the normal range. Hypoproteinemia, which occurs at stage 5, is associated with the metabolic characteristics of the postoperative period during extensive surgical interventions and does not depend on the method and drug of anesthesia.

**Safety assessment**

When rubufin was used in 18 patients (56.25%), the following side effects were observed: in three cases (9.4%) severe sweating, in 6 cases (18.8%) nausea, in 3 cases (9.4%) dizziness , drowsiness was observed in 18 cases (56.3%). No serious side effects were observed. The vast majority of side effects were observed in patients with intravenous administration of the drug. Side effects. The number and nature of side effects is presented in table 5.

**Figure 6.**
Oxygen partial pressure in arterial blood in studied patients.

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

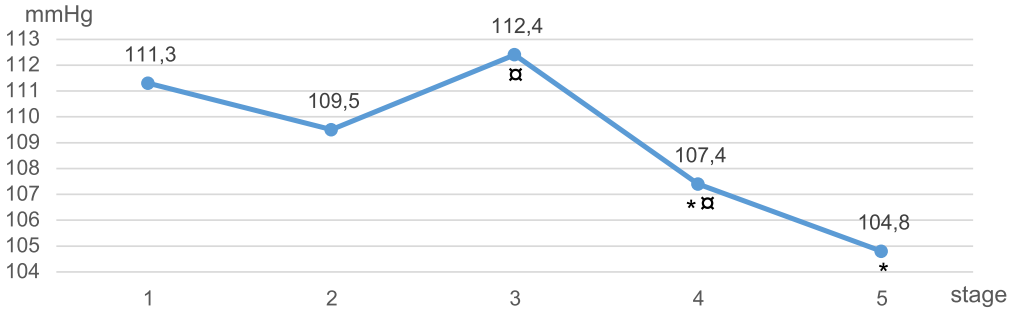


**Figure 7.**
Carbon dioxide partial pressure in studied patients.

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

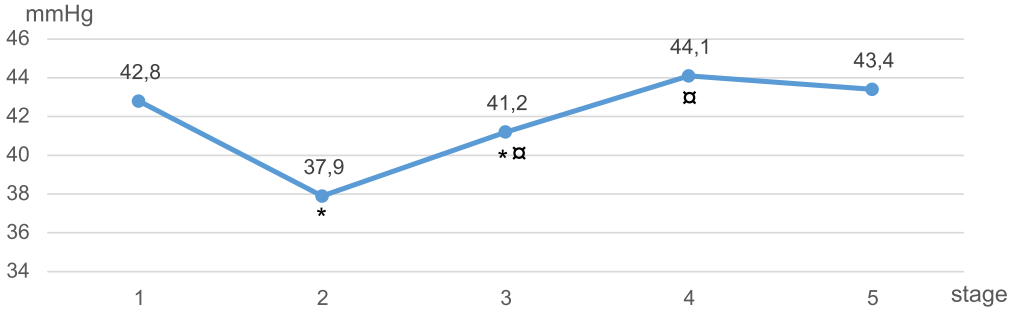


**Table 3.**
Respiratory and acid-base parameters in studied patients

** - p<0,05 in comparison with baseline stage*
*¤ - p<0,05 in comparison with previous stage*

| Parameter / stage | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| RR ($min^{-1}$) | 18,8±3,1 | 22,4±2,7* | 16,3±2,1*¤ | 18,4±1,8¤ | 14,2±1,6*¤ |
| pH | 7,37±0,07 | 7,41±0,1* | 7,38±0,09¤ | 7,43±0,07*¤ | 7,4±0,05¤ |
| BE (mmol/l) | -1,43±0,22 | -1,14±0,62* | -1,24±0,44* | -1,11±0,27*¤ | -1,54±0,25*¤ |
| $pO_2$ (mmHg) | 111,3±33,6 | 109,5±23,4 | 112,4±16,6¤ | 107,4±18,8*¤ | 104,8±8,9* |
| $pCO_2$ (mmHg) | 42,8±2,6 | 37,9±3,4* | 41,2±2,1*¤ | 44,1±3,3¤ | 43,4±1,9 |
| $sO_2$ (%) | 98,5±3,3 | 97,8±6,1* | 99,1±4,2¤ | 98,3±3,7¤ | 98,6±4,1 |

| Parameter / stage | 1 | 5 |
|---|---|---|
| Glucose (mmol/l) | 6,2±1,1 | 5,6±1,6 |
| Lactate (mmol/l) | 1.8±0.07 | 1.4±0.1 |
| Potassium (mmol/l) | 3,8±0,44 | 4,1±0,8 |
| Sodium (mmol/l) | 144,2±38,4 | 138,7±33,9 |
| Total bilirubin (mcmol/l) | 12,6±4,4 | 14,3±3,2 |
| Total protein (g/l) | 64,9±5,2 | 62,8±8,4* |
| Creatinine (mcmol/l) | 68.0±8.0 | 72.0±3.0 |

**Table 4.**
Metabolism parameters in studied patients

** - p<0,05 in comparison with baseline stage*

| Adverse effect | Intravenous | | Intramuscular | |
|---|---|---|---|---|
| | Amount | % | Amount | % |
| Nausea | 4 | 12,5 | 2 | 6,25* |
| Dizziness | 1 | 3,125 | 2 | 6,25 |
| Sweating | 2 | 6,25 | 1 | 3,125 |
| Drowsiness | 10 | 31,25 | 8 | 25* |
| **Total:** | **17** | **53,1** | **13** | **40,6*** |

**Table 5.**
Rate of adverse effects in patient treated with rubufin

** - p <0,05 in comparison with intravenous rout*

## Conclusion

A study of the effectiveness of anesthesia with Rubufin in patients in the postoperative period revealed a fairly high efficacy of this drug with a relatively small number of side effects and insignificant effect on the cardiovascular and respiratory systems. There was a decrease in pain syndrome, myocardial tension index after using rubufin from 236.6 ± 18.6 to 127.8 ± 28.8 units, a decrease in heart rate from 95.6 ± 8.8 to 83.2 ± 11.7 per minute, respiratory rate from 22.4 ± 2.7 to 16.3 ± 2.1 per minute, decrease in mean arterial pressure in proportion to decrease in pain syndrome, increase in stroke volume from 50.2 ± 8.6 to 61.3 ± 7, 7, due to a decrease in heart rate with a relative stability of cardiac output, lack of respiratory depression, an increase in oxygen tension in the blood from 109.5 ± 23.4 mm Hg. up to 112.4 ± 16.6 mm Hg, no changes in blood biochemical parameters when using rubufin.

Thus, a high efficiency has been proven in anesthesia in patients with moderate and severe pain syndrome after extensive surgical interventions, and an improvement in blood oxygenation and stroke volume associated with the elimination of pain syndrome.

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# CLINICAL EVALUATION OF LONG-TERM SURGICAL TREATMENT RESULTS IN PATIENTS WITH ULCERATIVE COLITIS

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***Abstract***

*The study was carried out on the basis of the Scientific Center of Surgery named after M.A. Topchibashev in the Department of Surgical Coloproctology and Surgical Clinic of the Azerbaijan Medical University (AMU), 37 patients were inpatient. All hospitalized patients underwent general clinical (collection of complaints, study of anamnesis, physical examination data), laboratory, as well as endoscopic, morphological and radiological examinations.*

**Keywords**
*ulcerative colitis, anamnesis*

## Ойық жаралы колиті бар науқастарда хирургиялық емдеудің алшақ нәтижелерін клиникалық бағалау

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***Аңдатпа***

*Зерттеу М.А.Топчибашев атындағы ғылыми хирургия орталығы негізінде Әзербайжан медициналық университетінің (АМУ) хирургиялық колопроктология және хирургиялық клиника бөлімінде жүргізілді, 37 науқас стационарлық жағдайда болды. Ауруханаға жатқызылған барлық науқастар жалпы клиникалық (шағымдарды жинау, анамнезді зерттеу, физикалық тексеру деректері), зертханалық, сонымен қатар эндоскопиялық, морфологиялық және рентгенологиялық тексерулерден өтті.*

**Түйін сөздер**
*спецификалық ойық жаралы колит, анамнез*

## Клиническая оценка отдаленных результатов при хирургическом лечение у больных с неспецифическим язвенным колитом

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***Аннотация***

*Исследование проводилось на базе Научного центра хирургии имени М.А. Топчибашева при кафедре хирургической колопроктологии и хирургической клиники Азербайджанского медицинского университета (АМУ), на стационарном лечении находились 37 пациентов. Всем госпитализированным больным проводились общеклинические (сбор жалоб, изучение анамнеза, данные физикального обследования), лабораторные, а также эндоскопические, морфологические и рентгенологические исследования.*

**Ключевые слова**
*неспецифический язвенный колит, анамез*

## Relevance

Ulcerative colitis (UC) is a nonspecific autoimmune lesion of the large bowel of unexplained etiology, known since the middle of the 19th century. Since the middle of the 20th century, there has been a fairly rapid increase in the incidence, mainly of residents of the most developed countries [1,8,19]. With relatively mild forms of UC (usually with distal and left-sided lesions of the colon), under the influence of modern conservative treatment, it is possible to obtain satisfactory results [3, 5, 8, 9, 11, 12, 22]. At the same time, severe forms of the disease are very resistant to conservative therapy and in most cases lead either to severe complications requiring urgent surgical intervention, or to a forced elective surgery due to the development of "colitic carcinoma". The risk of malignancy in UC increases sharply with a disease duration of more than 10 years, especially if the disease began at the age of less than 18 years [2,3,7,21,23]. Frequent and prolonged exacerbations of severe UC, accompanied by severe intoxication and blood loss, lead to patient exhaustion, profound metabolic disorders, anemia, hormonal dependence due to the inevitable transition to steroid therapy with all its negative consequences.

A radical operation for severe ulcerative colitis is panproctocolectomy, in which a cure is achieved at the cost of a permanent ileostomy. Given the crippling nature of this surgical intervention, the indications for it in the past were made rather carefully. However, the improvement of the surgical technique by forming an ileoanal anastomosis with a reservoir from the ileum (pocket) has led to a significant expansion of indications for surgical treatment of ulcerative colitis [6, 14, 17, 20]. However, such operations are often accompanied by complications and undesirable consequences (anastomosis failure - 10-20% of cases, inflammation in the pocket area - up to 30%, fecal incontinence, disorders of sexual function and function of the pelvic organs - up to 30% of cases) [1, 18, 19].

Domestic surgeons, like most foreign authors, both in emergency and in elective surgery, most often perform subtotal colectomy with temporary imposition of ileo- and sigmoidostomy. The high risk of developing ileorectoanastomosis failure, associated with a pronounced destructive inflammatory process in the rectum, forces surgeons to perform the operation in 2 stages (followed by restorative operation). Although during reconstructive surgery, it is still necessary to anastomose the ileum with the stump of the sigmoid or rectum affected by colitis [5, 6, 7, 9, 19].

A number of surgeons consider total colectomy with one-stage ileorectostomy to be the operation of choice in the surgical treatment of ulcerative colitis. With a favorable outcome, this operation eliminates the need to perform a second intervention, accelerates the onset of recovery without a period when the patient is forced to have a functioning ileostomy. The long-term results of single-stage surgical treatment of ulcerative colitis remain unexplored, there is no data on the morphofunctional state of ileorectoanastomosis, the mucous membrane of the ileum and rectum after total colectomy. All of the above determined the relevance of this topic and served as the basis for determining the goal and main objectives of the study.

## Materials and methods

On the basis of the Scientific Center of Surgery named after M.A. Topchibashev at the Department of Surgical Coloproctology and in Surgical Clinic of the Azerbaijan Medical University (AMU) 37 patients were on inpatient treatment (23 males (62.2%), 14 females (37.8%). The age of patients ranged from 5 to 49 years, the average age was 14.7±2.7 years), who were treated with a diagnosis of moderate and severe ulcerative colitis in the period from 2011 to 2019. During these years, the department performed 27 subtotal and total colectomies with one-stage ileorectostomy in patients (aged 18 to 49 years). Depending on the method of forming the anastomosis, the patients were divided into two groups.

The control group included 10 patients who were operated on from 1998 to 2006 by traditional methods, with the formation of an ileostomy.

27 patients made up the main group of those operated from 2011 to 2019. Fixation in the ileal stump of a wide silicone tube (ileostomy drainage) and its removal transrectally outward after subtotal and total colectomies with simultaneous ileorectostomy for UC provides in the immediate postoperative period emptying of the small intestine without contact of the intestinal chyme with the sutures of the ileorectoanastomosis, providing favorable conditions for the healing of the intestinal suture.

All hospitalized patients underwent general clinical (collection of complaints, study of anamnesis, physical examination data), laboratory, as well as endoscopic, morphological and radiological examinations. Laboratory blood tests, including biochemical analysis, urinalysis, microbiological studies of feces, were carried out according to generally accepted methods. Examination of the rectum and colon was performed sequentially. During general and rectal examinations, the state of the tissues of the perianal region and the anal canal, the rectal sphincter closure function, preparation of the rectum for endoscopic examination, as well

as the preliminary determination of the pathological process and the assessment of the nature of rectal discharge were assessed.

All patients underwent sigmoidoscopy with biopsy, in which the condition of the mucous membrane, its color, vascular pattern, the nature of inflammatory and destructive changes, and bleeding were assessed. To prepare for sigmoidoscopy in patients with ulcerative colitis, a cleansing enema with isotonic sodium chloride solution was performed in the evening before the study and in the morning 1.5-2 hours before sigmoidoscopy.

During sigmoidoscopy, all patients showed damage to the mucous membrane of the rectum and sigmoid colon, which was manifested by their sharp hyperemia, edema, looseness and contact bleeding. In all patients, against the background of a pronounced inflammatory process, erosive and ulcerative changes were also observed. In patients with the most severe colitis, erosions and ulcers were numerous. In 17 (45.9%) cases, significant narrowing of the rectum was revealed, and in 8 patients the rectum was narrower than the tube of the pediatric rectoscope. In 20 (54.1%) patients, pseudopolyps were found in the sigmoid colon, which are areas of growth of granulation tissue or islets of preserved inflamed mucosa against the background of cicatricial retractions.

The severity of pathological changes detected by sigmoidoscopy has always been adequate to the severity of clinical manifestations. In more than half of patients with severe and long-lasting disease, inflammatory and destructive changes were combined with the processes of regeneration and scarring.

Histological examination of biopsy specimens of the rectal mucosa was performed in all patients. In this case, slit-like erosion and ulcerative defects were found, the bottom of which was represented by purulent-necrotic detritus or granulation tissue. The lamina propria of the mucous membrane was abundantly infiltrated with lymphocytes, plasma cells, and eosinophils. The lumen of the crypts was made with inflammatory detritus with the formation of crypt abscesses. A pronounced plethora of capillaries with leukodiapedesis was observed throughout the mucous membrane (Fig. 1).

Comparison of the data obtained during the histological study of the biotic material and the resected intestine showed that changes in the rectal mucosa fully reflect the essence of changes in other parts of the intestine, and therefore a biopsy of the rectal mucosa can be used to establish the nature and severity of the process (Fig. 2).

Fibrocolonoscopy with biopsy is one of the important methods of examination of patients with UC. Fibrocolonoscopy was performed during the observation in 22 (59.5%) patients before admission to the surgical hospital. At the same time, total colonoscopy was carried out only in 10 (45.5%) patients, up to the transverse colon - in 7 (31.8%), in 5 (22.7%) patients the study was carried out up to the sigmoid colon. As a rule, the obstacle to the high carrying out of the colonoscope was poor bowel cleansing, as well as kinks of the colon and dolichosigma. In 100% of cases, pathological changes were characterized by severe hyperemia, multiple erosions in 100% of cases, ulcers in 20 (54.1%) patients, pseudopolyposis in 9 (24.3%) patients, contact bleeding, spontaneous bleeding in 8 (21.6 %) patients.

Evaluation of long-term results of simultaneous subtotal and total colectomy with ileorectostomy for severe nonspecific ulcerative colitis (Fig. 3) in patients showed that in almost 95% of patients in the first 1-2 years after surgery, regression of systemic complications of UC occurred, and ulcerative proctitis tends to subside and persistent long-term remission. Only in 3.1% of patients, colectomy with ileorectostomy did not lead to relief of the inflammatory and ulcerative process in the rectum (Fig. 4).

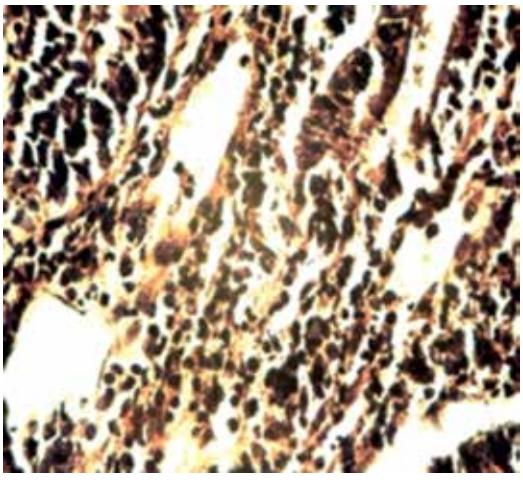

**Figure 1, 2.** Histological changes in the colon with a pronounced degree of activity of nonspecific ulcerative colitis: a - deep folds of the mucous membrane (MM); b - crypt abscesses in MM; c - slit erosion; d - polypoid swelling in MM; fig. a-d staining with hematoxylin and eosin, enlargement 250.


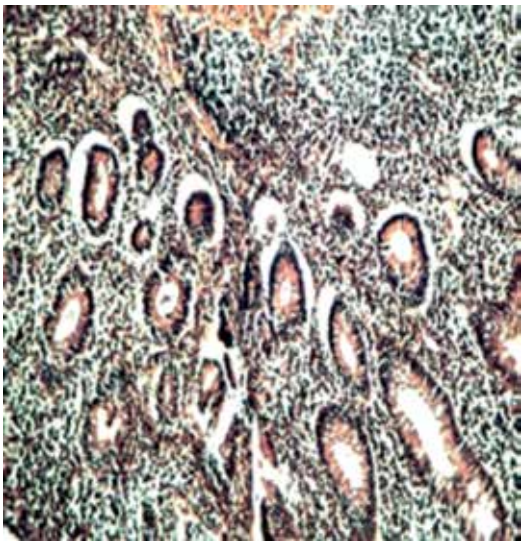

**Figure 3, 4.**
Histological changes in the mucous membrane (MM) of the rectum and ileorectoanastomosis with the activity of inflammation: a - thinning of the MM, stromal edema; b, c - dense lymph-plasma cell and eosinophilic inflammatory infiltration of MM, plethora of capillaries, leukodiapedesis; d - destruction of the integrity of the crypt by an inflammatory infiltrate; fig. a-d staining with hematoxylin and eosin; fig. a - x125, b, d - x250, c - x400.

## Conclusion

Evaluation of long-term results of one-stage total colectomy with ileorectostomy for severe nonspecific ulcerative colitis in patients showed that in almost 91% of patients in the first 1-2 years after surgery there was a regression of systemic complications of UC, and ulcerative proctitis tends to subside and persistent long-term remission. Comparison of the data of endoscopic studies with the results of a simultaneous extended biopsy of the mucous membrane from the terminal ileum, rectum and from the area of ileorectoanastomosis showed that in 76.3% of patients inflammatory changes in the rectal mucosa were absent with its moderate atrophy, and in 23.7% of patients at the time of endoscopic examination, catarrhal changes with II degree of inflammation activity were noted.

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# MINI-ACCESS AT COLLAPSOSURGICAL TREATMENT OF PATIENTS WITH FIBROTIC CAVERNOUS PULMONARY TUBERCULOSIS WITH BROAD DRUG RESISTANCE

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***Abstract***

*Analyzed the results of the collapse-surgical method of treatment using a mini-access in 10 patients with fibrous-cavernous tuberculosis with extensive drug resistance. The effectiveness of surgical treatment in the main group was achieved in 9 (90.0%) patients versus 19 (63.3%) patients in the control group. Performed accesses did not affect the effectiveness of surgical treatment. There is a difference in cosmetic effect: advantage in length of access from 6 to 8 cm versus large incision bordering the scapula.*

**Keywords**
*extensively drug-resistant tuberculosis, thoracomyoplasty, silicone implant, valve bronchoblockation*

## Дәріге төзімді фиброзды-кавернозды өкпе туберкулезі бар науқастарлы коллапсохирургиялық емдеудің шағын жолы

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***Аңдатпа***

*Дәріге төзімді фиброзды-кавернозды өкпе туберкулезі бар 10 науқастың мини қолжетімділігі бойынша коллапсохирургиялық емдеу әдісінің нәтижелері талданды. Бақылау тобындағы 19 (63,3%) науқасқа қарсы негізгі топтағы 9 (90,0%) науқас хирургиялық емдеудің тиімділігіне қол жеткізді. Орындалған қолжетімділіктер хирургиялық емдеудің тиімділігіне әсер еткен жоқ. Косметикалық әсерлер бойынша айырмашылықтар бар: кесіндінің үлкен жиекті қалақшасына қарсы 6-8 см аралығындағы қолжетімділіктің ұзындығы бойынша басымдық.*

**Түйін сөздер**
*үлкен липома, жүйке компрессиясы, ауырсыну синдромы*

## Мини доступ при коллапсохирургическом лечении больных с фиброзно-кавернозным туберкулезом легких с широкой лекарственной устойчивостью

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***Аннотация***

*Анализированы результаты коллапсохирургического способа лечения из мини доступа у 10 больных с фиброзно-кавернозным туберкулёзом с широкой лекарственной устойчивостью. Эффективность хирургического лечения в основной группе достигнута у 9(90,0%) больных против 19(63,3%) больных контрольной группы. Выполненные доступы не повлияли на эффективность хирургического лечения. Имеется различие в косметическом эффекте: преимущество по длине доступа от 6 до 8 см против большого окаймляющего лопатку разреза.*

**Ключевые слова**
*Туберкулёз с широкой лекарственной устойчивостью, торакомиопластика, силиконовый имплант, клапанная бронхоблокация*

Introduction Treatment of extensively drug-resistant fibrotic cavernous tuberculosis (XDR-FCT) is one of the complex problems of modern Phthisiology, associated with the severity of irreversible morphological changes in the lung tissue. The presence of mycobacteria with resistance to most of the available antituberculous drugs (anti-TB) significantly reduces the effectiveness of chemotherapy treatment. Thus, according to various authors, the effectiveness of various chemotherapy regimens with the I,II line drugs and new modern repurposed drugs is achieved 30-68% of cases[1,2,3]

The limited effects of chemotherapy for the treatment of this patients, there are hopes for surgical treatment. However, due to the large pathomorphological changes, the prevalence of the tuberculosis process, the presence of concomitant pathology in most patients and the severity of functional disorders of the respiratory system, it is not always possible to perform radical resection. Some authors reported, that only 10% of patients can have surgery, but patients with extensively drug-resistant tuberculosis (XDR-TB) show postoperative complications [4,5,6,7,8].

According To A. El'kina, Yu. M. Repin et al. it is noted that 42% of those operated patients with XDR-TB had postoperative complications, and the mortality rate was 25% of cases [9]. The high percentage of postoperative complications and high mortality rate are also confirmed by our research [10].

An alternative for this category of patients is collapsosurgical interventions [11,12,13,14]. Available various modifications of thoracoplasty have the disadvantage, such as cosmetic defect of the chest, poor posture, scapula indentation on the side of the operation, a large postoperative scar in the projection of the scapula, etc., which often leads to refusing of young patients from this type of surgery. With this in mind, at surgical treatment of pulmonary tuberculosis and multiple-drug resistant tuberculosis department of National Scientific Center of Phthisiopulmonology(NSCP), we developed a technique of thoracoplasty using a silicone implant in combination with a mini-access bronchoblocation, which allows performing the operation by an 6-8 cm incision and eliminates the above disadvantages of thoracoplasty (patent of the Republic of Kazakhstan for invention No. 34636-2019/0141.1 from 16.10.2020y.)

## Aim of the study

Determine the effectiveness of thoracoplasty using a silicone implant in combination with XDR-FCT.

## Materials and methods

There were analyzed results of thoracoplasty method using a silicone implant in combination with bronchoblockation from mini-access in 10 patients with XDR-FCT.

The control group consisted of 30 patients who underwent a similar method of thoracoplasty from a standard incision, bordering the scapula.

In the analyzed main group, there were 8(80%) males and 2 (20%) females. The control group consisted of 19 female patients (63.3%) and 11 male patients(36.7%).

The age of the analyzed groups was shown in Table 1.

The table revealed that both groups were operated on mainly by young people under 40 years of age.

All patients in the main and control groups were diagnosed with extensively and multiple drug-resistant fibrotic cavernous tuberculosis.

In the main group, the right upper-lobe localization of the pathological process was in 5 (50%) patients and was similarly located on the left.

In the control group, the localization of the tuberculosis process in the left upper-lobe was in 13(43.3%) and right-sided in 17(56.7%) patients.

In both groups, the duration of pulmonary tuberculosis disease lasted from 2 to more years (Table 2).

Fibrobronchoscopy was performed in all patients of the analyzed groups before surgery with a biopsy from the bronchial mucosa. In the main group, 3(30%) had infiltrative - ulcerative tuberculous endobronchitis, 3(30%) had cicatricial stenosis

**Table 1.**
Age structure of operated patients in the main and control groups

| Group | Age | | | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 20-29 | | 30-39 | | 40-49 | | 50 and more | | | |
| | Abs | % | Abs | % | Abs | % | Abs | % | Abs | % |
| Main | 4 | 40 | 1 | 10 | 3 | 30 | 2 | 20 | 10 | 100 |
| Control | 10 | 33,4 | 14 | 46,6 | 4 | 13,3 | 2 | 6,7 | 30 | 100 |

**Table 2.**
Disease duration in patients of the main and control groups

| Group | Disease duration (years) | | | | | | Total | |
|---|---|---|---|---|---|---|---|---|
| | from 2 to 4 | | from 5 to 10 | | more 11 years | | | |
| | Abs | % | abs | % | abs | % | Abs | % |
| Main | 2 | 20 | 4 | 40 | 4 | 40 | 10 | 100 |
| Control | 12 | 40 | 15 | 50 | 3 | 10 | 30 | 100 |

of various degrees, and 4(40%) had endobronchitis without signs of active inflammation on the side of the lesion by the pathological process.

In the control group, 11 (36.7%) patients had active tuberculous endobronchitis, 7 (27.3%) had stenosis of various degrees, and 12 (40.0%) had endobronchitis without signs of active inflammation.

Based on bacteriological and molecular genetic studies of sputum in the main group, 4 (40%) patients were found to have multiple drug resistance and 6 (60.0%) had broad drug resistance. In the control group, multiple drug resistance was detected in 3(10.0%) and in 27(90.0%) broad drug resistance. All patients had a failure from previous courses of chemotherapy.

All patients in the analyzed groups were prescribed different chemotherapy regimens in accordance with the drug resistance test.

In the main group, 5 (50%) patients received second-line (reserve) drugs, and 5 (50%) patients received a treatment regimen of new reprofiled anti-TB drugs.

In the control group, the treatment regimen consisted of reserve line drugs.

The chemotherapy regimens from the reserve-line anti-TB drugs contained aminoglycosides (Am/Km/Cm), fluoroquinolones(Ofx/Mfx), cycloserine (Cs), thiamides(Eto/Pto), PASC(Pas), and the treatment regimens from new anti-TB and repurposed drugs included bedaquillin(Bdg), delamanide(Dlm), linezolid(Lzd), clofazamine (CFZ)

The main indication for surgical treatment in the analyzed groups was the presence of pronounced destructive changes in the lungs and the lack of effect from chemotherapy.

All patients of the main and control groups underwent collapsosurgical interventions using a silicone breast implant as a filling material with prevalvular bronchoblockation of the draining bronchus of the affected lung sections.

The difference in the method of operations in the main group was access to the extrapleural region. It was carried out from a mini incision up to 6-8cm long, against the incision bordering the scapula in the control group. In the future, the course of the operation was similar in both groups.

In both groups, surgical interventions were performed during up to 12 months of the intensive treatment phase.

For effective collapse of the lung, up to 4-5 ribs were fragmentally resected and a bed was created in the extrapleural area for the silicone implant, which was selected by diameter and height (Table 3).

In the postoperative period, monthly x-ray monitoring of the collapsed lung area after thoracoplasty was performed using this method, sputum sampling for the presence of mycobacterium tuberculosis (M.tb) and dynamic monitoring of the state of bronchoblockers.

Evaluation of the effect of mini access with this method of collapsosurgical intervention on the achievement of selective collapse of the affected area of the lung and at the same time on the effectiveness of treatment was determined by the following criteria:

- Based on the results of sputum tests for M.tb by microscopy, bacteriological seeding on Lowenstein-Jensen medium, BACTEC
- On the closure of the decay cavity (cavern) during x-ray tomography studies

## Results, discussion

As a result of surgical interventions performed against the background of adequate chemotherapy in patients of the analyzed groups and dynamic follow-up, the following disease outcomes were obtained (Table 4).

As can be seen from Table 4, the outcomes of complex treatment of patients determined after bacteriological sputum tests after treatment were obtained in all 30 patients of the control group and

| Group | Extrapleural thoracoplasty | | | Total |
|---|---|---|---|---|
| | Four ribs | Five ribs | Six ribs | |
| Main | 4(40%) | 6(60,0%) | - | 10 |
| Control | 20(66,7%) | 7(23,3%) | 3(10,0%) | 30 |

**Table 3.**
Types of thoracoplasty in the main and control groups

| № | outcomes | Groups | |
|---|---|---|---|
| | | Main (n-10) | Control (n-30) |
| 1 | Cured | 7(70,0) | 19(63,3) |
| 2 | Treatment completed | 2(20,0%) | - |
| 3 | Treatment failure | - | 8(26,7%) |
| 4 | Died | - | 3(10,0%) |
| 5 | Continue treatment | 1(10,0%) | |
| 6 | Treatment success | 9(90,0%) | 19(63,3%) |

**Table 4.**
Treatment outcomes of patients in the main and control groups

**Table 5.**
Control X-Ray tomography studies in the main and control groups

| № | Groups | | | Total |
|---|---|---|---|---|
| | | Reduction in cavern cavity | Complete closure of the cavern | |
| 1 | Main | 2(20,0) | 7(70,0%) | 9 |
| 2 | Control | 8(26,7%) | 22(73,3%) | 30 |

in 9 of the main group. However, a positive outcome (treatment success) of surgical treatment with chemotherapy in patients of the main group was achieved in 9(90%) patients. One patient in this group has not yet completed a full course of chemotherapy. In the control group, treatment success was achieved in 19 (63.3%) patients.

After completion of treatment and observation of patients, control x-ray examinations were performed(Table 5).

As shown in Table 5, surgical interventions with different access sizes in the main and control groups achieved almost the same degree of effective collapse of the affected lung area. Cavern closure in the main group in 70.0%, in the control group in 73.3% of patients. Incomplete collapse occurred in 2 (20.0%) patients of the main group and in 8 (26.7%) patients of the control group.

Analysis of treatment failures and the "Died" outcome in 11(36.7%) patients in the control group showed that their causes were incomplete cavern closure and active tuberculosis process in the bronchi at the time of surgery, which progressed in the postoperative period and led to the continuation of bacterial excretion in 8(26.7%) patients and the development of respiratory failure in 3(10.0%)patients with a lethal outcome.

During dynamic monitoring of the state of valvular bronchial blockers in 3(10.0%) patients, the latter were removed after 1 month due to the progression of the active tuberculosis process in the bronchi. In the main group of indications for removal of bronchopleural not revealed.

The effectiveness of surgical treatment in the main group was achieved in 9 (90.0%) patients versus 19 (63.3%) patients in the control group. On high efficiency treatment in the main group, in our opinion, was the use of new reprofiled drugs as becquelin, linezolid, Dalmane in 5(50%) patients.

Thus, the analysis of collapse surgery results in patients with drug-resistant pulmonary tuberculosis showed that the performed approaches in both methods did not affect the effectiveness of surgical treatment. There is a difference only in the cosmetic effect: the advantage in the length of access from 6 to 8 cm against a large incision bordering the shoulder blade (Fig. 1).

## Conclusion

1. Application collapsosurgical intervention in patients with drug-resistant pulmonary tuberculosis with the use of silicone implant in combination with valve bronchoblockation from mini incision access is a promising way to eliminate cosmetic defect of the chest wall.
2. Effectiveness collapsosurgical intervention increases on the background of chemotherapy regimens using new reprofiled anti-TB drugs.

**Figure 1.**
Type of postoperative scar:
*A-control group;*
*B-main group (mini incision access)*


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# SURGICAL TREATMENT OF SHOULDER DISLOCATION

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***Abstract***

*Operational treatment of recurrent shoulder dislocation is present as a most difficult problem in modern orthopedics. This pathology is prevalent, the result of treatment is not usually gratifies the orthopedists and the patients. That's why the search of new methods of curing the given injury is always common. In last 5 years 22 patients with recurrent shoulder dislocation injury were operated in City Hospital of Emergency (Almaty city). The usual aid of patients is from 20 to 50 years old. 12 patients were operated by Bancart methodic and 10 patients were operated with new methodic. The results of treatment by new methodic had a better result than a methodic of Ban cart and are recommended for curing in hospitals.*

**Keywords**
*shoulder dislocation, treatment*

## Әдеттегі иықтың шығуын хирургиялық емдеу

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***Аңдатпа***

*Әдеттегі иықтың шығуын хирургиялық емдеу заманауи ортопедияның күрделі мәселелерінің бірі болып табылады. Бұл патология кең таралған, емдеу нәтижелері ортопедтерді, көбінесе пациенттерді әрқашан қанағаттандыра бермейді, сондықтан жаңа шешімдерді іздеу орынды және өзекті.*

*Соңғы 5 жыл ішінде біз жедел медициналық көмек ауруханасының травматология бөлімінде емделген 22 пациентке ота жасадық (Алматы қ.). Науқастар 20-дан 50 жасқа дейін болды. Ban cart операциясы 12 пациентке жасалды, 10 пациентке әдеттегі иықтың шығуының хирургиялық емінің жаңа әдісі қолданылды.*

**Түйін сөздер**
*иықтың шығуы, емдеу*

## Оперативное лечение привычного вывиха плеча

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***Аннотация***

*Оперативное лечение привычного вывиха плеча является одной из наиболее сложных проблем современной ортопедии. Данная патология широко распространена, исходы лечения не всегда удовлетворяют ортопедов, а зачастую и пациентов. Поэтому поиски новых решений оправданы и актуальны. За последние 5 лет нами прооперировано 22 больных с привычным вывихом плеча, лечившихся в травматологическом отделении Больницы Скорой Неотложной помощи (Алматы). Возраст больных - от 20 до 50 лет. Операция Банкарта была выполнена 12 пациентам, 10 больным применили новую методику оперативного лечения привычного вывиха плеча.*

**Ключевые слова**
*вывих плеча, лечение*

## Relevance

Surgical treatment of the shoulder dislocation is one of the most difficult problems of modern orthopedics [2]. This pathology is widespread; treatment outcomes are not always satisfactory for orthopedists, and often for patients [2, 4, 5]. Therefore, the search for new solutions is justified and relevant.

Over the past 5 years, we have operated on 22 patients with dislocated shoulder, treated in the traumatology department of the Emergency Hospital (Almaty city). The patients' age is from 20 to 50 years. The Bankart operation was performed in 12 patients, a new method of surgical treatment of dislocated shoulder was used in 10 patients.

While developing this surgical treatment methodofshoulder dislocation (RF patent No. 2179419), a method was created that would reliably strengthen the anterior section of the shoulder joint [3]. The apex of the coracoid process is exposed by a linear incision along the deltoid-thoracic groove, cut off by an osteotome and lowered along with the muscles attached to it. The subscapular muscle is crossed 4-5 cm from the place of its attachment directly through the muscle tissue, while the shoulder is brought to the position of maximum external rotation. The shoulder is moved to the position of internal rotation, and the proximal muscle is sutured to the soft tissues in front of the scapula neck. Then, an allograft from the dura mater is sewn on top of the proximal subscapularis muscle with interrupted sutures. The distal part of the subscapular muscle is carried out over the allograft and fixed with interrupted sutures in the region of the small tubercle of the humerus. The top of the coracoid process is sutured in place with a nylon suture. A layer-by-layer wound suture is performed, immobilization with a plaster cast for a month, courses of exercise therapy and FTL.

The stages of the operation are shown in Figures 1-3.

The shoulder is rotated outward, the subscapular muscle is crossed in its muscular part, while ligatures are applied to the distal part of the muscle. Next, the shoulder is moved to the position of maximum internal rotation and the proximal subscapular muscle is sutured to the soft tissues in front of the scapula neck (Fig. 1).

On top of the proximal subscapular muscle, an allograft is placed from the preserved dura mater, which is fixed with nylon interrupted sutures (Fig. 2).

Then the distal subscapular muscle is held over the allograft, which is sutured in the area of the lesser tubercle of the humeri (Fig. 3).

The top of the coracoid process is fixed in place with one nylon suture. The wound is sutured tightly in layers. The limb is immobilized with a Dezo plaster cast for 1-1.5 months, during which the conserved dura mater is replaced by connective tissue [1]. Thus, as a result of the operation, the patient develops a pronounced connective-tissue-muscular complex, which strengthens the anterior section of the shoulder joint and prevents repeated dislocations, which is clearly visualized during control ultrasound. Application of this method reduces the likelihood of developing adduction and rotational contractures of the shoulder joint.

We managed to track the outcomes of the surgical treatment of our patients in terms of up to 3 years.

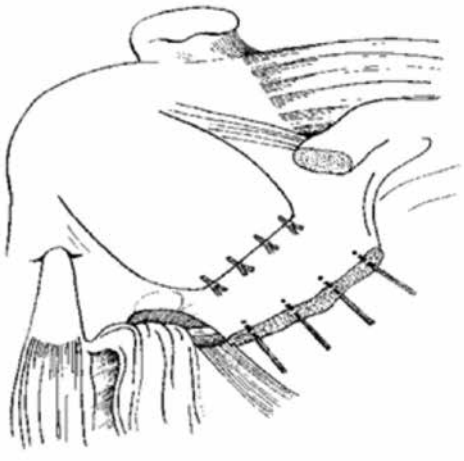

**Figure 1.**
Suturing the proximal subscapular muscle to the soft tissues in front of the scapula neck

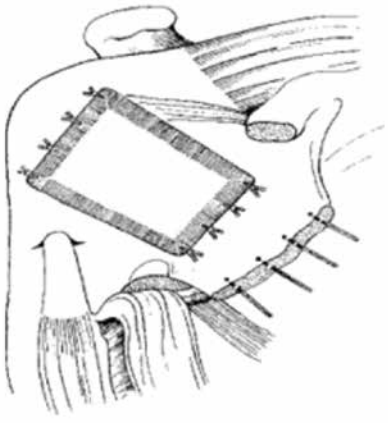

**Figure 2.**
Suturing of the allograft from the preserved dura mater

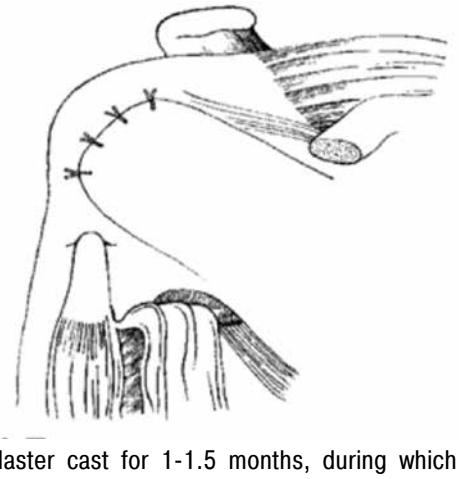

**Figure 3.**
Suturing the distal subscapular muscle to the lesser tubercle of the humeri

Outcomes of surgical treatment of shoulder dislocation according to the Bankart technique. In the nearest postoperative period, 7 people had partial marginal skin necrosis in the area of the postoperative suture. We managed to cope with these complications by conservative methods. While analyzing the causes of these complications, we established the factors that contributed to such an unfavorable outcome: prolonged surgery, insufficient skin incision and gross manipulations with retractor hooks in the surgical wound.

In 2 cases, a recurrence of the shoulder dislocation was revealed, in 1 case the cause was a repeated injury to the area of the operated joint. In 2 case, unreasonably early termination of plaster immobilization (indiscipline of patients!) was established, followed by inadequate physical activity. Limitation of movements in the shoulder joint was noted in 2 cases, which is undoubtedly associated with the peculiarities of the technique of the surgical aid itself.

Outcomes of surgical treatment of shoulder dislocation according to the new method. Relapse of shoulder dislocation was detected in 1 patient due to domestic injuries. Restriction of movements in the operated joint was noted in 2 patients, for whom, at the beginning of the development of the technique, we crossed the subscapular muscle through its tendon part, and not through the muscle part, as we did later. However, the patients did not consider the limitation of movements to be functionally significant; the main thing for them was the absence of dislocations.

Examination after 2 years did not reveal any recurrence of shoulder dislocation, full movement, periodic pain in the joint, as a rule, after heavy physical exertion.

The results obtained in the treatment of shoulder dislocationusing a new method of open intervention make it possible to recommend them for use in specialized orthopedic and trauma hospitals.

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# CLINICAL AND ACADEMIC ASPECTS OF PERIPHERAL ARTERY ANEURISM. REVIEW. PART TWO

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***Abstract***

*The problem of choosing tactics for treating patients with peripheral artery aneurysm of various etiology and localization. Probably, it will be relevant for vascular surgeons who periodically face non-trivial clinical situations requiring non-standard solutions. Surgical intervention on aneurysmically dilated vessels should be carried out using preoperative diagnostic training, including instrumental examination, in order to determine the volume of intervention, access, and stratification of operational risk.*

**Keywords**
*complex surgical treatment of peripheral artery aneurysms*

## Перифериялық артерия аневризмасының клиникалық және академиялық аспектілері. Әдебиетке шолу. 2 бөлім

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***Аңдатпа***

*Түрлі этиологиядағы және локализациядағы перифериялық артериялардың аневизмасы бар науқастарды емдеу тактикасын таңдау мәселесі стандарттан тыс шешімдерді қажет ететін бейтривиал клиникалық жағдаяттармен тұрақты түрде ұшырасатын тамыр хирургтары үшін өзекті болуы мүмкін. Аневризмалық кеңейген тамырларға хирургиялық араласуды жүргізу операциялық қауіпті стратификациялау, қолжетімділікті жүзеге асыру, араласу көлемін анықтау мақсатында аспаптық зерттеуді қамтитын операция алдындағы диагностикалық дайындықты пайдалану арқылы өтуі тиіс.*

**Түйін сөздер**
*перифериялық артериялар аневризмасын кешенді хирургиялық емдеу*

## Клинико-академические аспекты аневризм периферических артерий. Обзор литературы. Часть 2

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***Аннотация***

*Проблема выбора тактики лечении пациентов аневризма периферических артерии различных этиология и локализация. Вероятно, будет актуальной для сосудистых хирургов, периодически сталкиваются с нетривиальными клиническими ситуациями, требующими нестандартного решения. Проведение хирургического вмешательства на аневризматически расширенных сосудах должно проводиться с использованием предоперационной диагностической подготовки, включающей инструментальное обследование, с целью определения объема вмешательства, осуществления доступа, стратификации операционного риска.*

**Ключевые слова**
*комплексное хирургическое лечение аневризм периферических артерии*

### 1.3. Surgical techniques for the treatment of peripheral arterial aneurysms

A radical method, when performing operations on the peripheral arteries of the lower extremities, are used open options of intervention [Belyakin SA, Pinchuk OV, Obraztsov AV, et al., 2014; Bracale U. M., Corte G., Di Gregorio A. et al., 2011]. However, endovascular surgical techniques have become very popular both among surgeons and patients, since modern stent designs have begun to be used in the prosthetics of those vessels that undergo constant flexion-extensor deformation under physiological conditions [Antoniou G.A, Schiro A., Smyth J.V. et al., 2012].

Summarizing the analytical information obtained in the study of literature data provided by domestic and foreign researchers, the following types of surgical interventions performed for aneurysms in the PSS can be distinguished [Belyakin S.A., Pinchuk O.V., Obraztsov A.V. ., 2014]:

1. Resection of the aneurysm followed by repeated arterial reconstruction;
2. X-ray endovascular stenting with a stent-graft (percutaneous or open access);
3. Resection of aneurysm with artery replacement;
4. Ligation of the adductor and outflow arteries with bypass grafting;
5. Resection of the aneurysm with suture (plastic in the damaged area) of the artery;
6. Amputation of a limb (primary or after ligation of arteries);
7. Excision of the aneurysm without revascularization
8. Ligation of arteries

Some works contain descriptive cases of surgical tactics used for aneurysms of the vessels of the upper limb. According to the authors, there are only literary indications of the likelihood of such a problem, and the primacy of the clinical description of this type of pathology belongs to them. The team of authors C. Bouvet, S. Bouddabous and J.Y. Beaulieu. operated on four patients with aneurysms of the vessels of the hand: one had an aneurysm of the thumb of the palmar digital artery, another in the area of the superficial palmar arch, and two others in the ulnar artery. All patients underwent excision with direct coronary artery bypass grafting; the patient has no venous prosthesis. All patients were followed up for several years after the operation, they underwent ultrasound to check the patency of the anastomosis, followed by arteriography for acute ischemia or CT angiography or MR angiography if necessary. All anastomoses were patent within 2 to 8 years after surgery. According to the authors' recommendation, it is better to use a straight arterial suture at the proximal and distal anastomosis for long-term permeability [Bouvet C, Bouddabous S, Beaulieu JY., 2018].

Endovascular interventions, despite a number of advantages over open surgical treatment, are invasive techniques and involve complications such as pulsating hematomas and false aneurysms of peripheral vessels, and their number increases in proportion to the spread of angiographic methods of diagnosis and treatment, . According to the literature, in the structure of local complications after puncture of the artery, false aneurysms occupy 60–80% Andall RG, Matusz P, du Plessis M, Ward R, Tubbs RS, Loukas M. The clinical anatomy of cystic artery variations: a review of over 9800 cases. Surg Radiol Anat. 2016 Jul. To reduce the incidence of complications, transaxillary, transbrachial and transradial approaches and suturing instruments are now more commonly used. However, even with such approaches and the development of endovascular technologies, damage to the punctured artery was noted. Today, surgical and compression methods with various modifications of them are relevant types of treatment for pulsating hematomas and false aneurysms.

Endovascular vascular occlusion is a relatively fast and less traumatic method that can be used either as an independent type of treatment,

In addition, endovascular treatment can be used to treat carotid artery aneurysms, bifurcation aneurysms, which often occur at a younger age. This method of treatment has been proven to be safe and acceptable [Ban SP, Hwang G, Kim CH, et al., 2018; Konczalla J, Platz J, Brawanski N, et al., 2015; Oishi H, Yamamoto M, Nonaka S, et al., 2013].

Thus, surgical intervention on aneurysmically dilated vessels should be carried out using preoperative diagnostic preparation, including instrumental examination, in order to determine the scope of intervention, access, and stratification of operational risk.

### 1.4. Complications of aneurysms and possible postoperative complications

Continuous postoperative observation is recommended after all types of interventions for aneurysms. Although its purpose is to prevent and / or detect early complications. With endoscopic interventions, the early postoperative period proceeds more safely [Baderkhan H, Haller O, Wanhainen A, et al., 2018].

Among all postoperative complications, 6

1. Early:

1.1. Bleeding

1.2. Suppuration

1.3. Lymphorrhea

1.4. Shunt or prosthesis thrombosis.

Somatic complication of the immediate postoperative period with PAA

1.1 Pneumonia

1.2 Exacerbation of chronic bronchitis

1.3 Myocardial infarction

1.4 acute cardiac vascular failure

Complications arising in the zone of access to the vessels during endovascular interventions occur in 5% - 16% of cases [Knowles M, Nation DA, Timaran DE, et al., 2015].

It is known that the stent configuration itself does not lead to postoperative complications [Schuurmann RCL, van Noort K, Overeem SP, et al., 2018].

Thus, when carrying out surgical treatment of patients with aortic and PAA aneurysms, it is necessary to take into account possible complications for stratification of postoperative and intraoperative risk.

Literary analysis we can be noted that the increase in the spread of peripheral aneurysms of various etiology.

**Surgical peripheral aneurysm**

There are no disagreements about the pathological anatomy and pathogenesis, until now there is no clear algorithm for diagnosing patients with APA. On the one hand, this leads to late diagnosis of the disease, after the development of its complications. The need for timely diagnosis of peripheral aneurysms is beyond doubt. However, focusing on literary sources, it can be noted that the problem is still far from being resolved.

Thus, the problems associated with the diagnosis and surgical treatment of PAA cannot be considered finally solved, since many issues need further research and development.

### 1.5. Organization of preventive medical care for patients with aneurysms of the vascular wall

Preventive and preventive medical care for patients with aortic aneurysms who are subject to surgical treatment is based on the timely detection and prevention of complications and / or adverse consequences after surgery.

One of the serious dangerous consequences of aneurysms is their rupture. Russian scientists have developed a special risk assessment scale for dissecting aortic aneurysm. This scale allows, at the pre-hospital stage of patient care, to identify those clinical factors and symptoms that can lead to this disease [Semenova L.N., Morova N.A., Potapov V.I., et al., 2016].

Until now, there is no clear algorithm for diagnosing patients with APA, on the one hand, this leads to late diagnosis of the disease, after the development of its complications. On the other hand, the development of modern diagnostic methods has not yet led to a generally recognized revision of recommendations for diagnostic tactics. The most controversial issue is the mandatory use of angiography in the diagnosis of this condition.

The need for timely diagnosis of APA does not raise doubts. However, focusing on literary sources, it can be noted that the stage of the problem is still far from being resolved. Also, many studies note that the surgical treatment of this pathology cannot be considered definitively developed. are primarily associated with the variety and complexity of anatomical options, a feature of hemodynamic disorders. The availability of various and far from diverse methods of surgical treatment.

Thus, the clinical diagnosis of aneurysms and peripheral arteries (APA) is based on the histogenetic, pathomorphological and pathophysiological features of the structure and functioning of the vascular wall. Consequently, a detailed and updated understanding of the morphological principles of the structure of blood vessels, the role and participation of the tissues forming the vascular wall is needed, which allows using high-tech diagnostic equipment to verify its pathological changes at early stages. Although improved imaging techniques such as X-ray, ultrasound, and echocardiogram have contributed to the earlier detection of aneurysms, surgery is currently the only treatment available. Undoubtedly, the volume of medical intervention, conservative or surgical, is determined taking into account the nuances listed above, which are presented in more detail in this section of the work.

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# IATROGENIC BILE DUCT STRICTURES AFTER CHOLECYSTECTOMY

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***Abstract***

*Benign biliary strictures can occur as a result of large variety of causes, but approximately more than 80% are iatrogenic after direct or vascular injury during laparoscopic or open cholecystectomy. Especiallyy after widespread application of laparoscopic cholecystectomy the incidence of iatrogenic bile duct injuries has increased two-four times higher than recorded in open cholecystectomy. Iatrogenic bile duct strictures (IBDS) can present with heteregenous clinical signs. The severity of clinical symptoms depends on stricture localization, the time of injury and septic condition. There are broad spectrum non- invasive (US, CT, MRI) and invasive (ERCP, IDUS) imaging techniques for confirming diagnosis and clarifying the etiologies of biliary strictures. At the moment MRCP is the "gold standart " for the complete evaluation of the biliary tree. Successful treatment requires a correct assessment of current patients condition with iatrogenic biliary strictures because, most of patients have a history of multiple interventions and complication. Despite different treatment tactics available for iatrogenic bile duct strictures the gold standard method is still not defined. The management of iatrogenic bile duct strictures after cholecystectomy are challenging and requires multidisciplinary approach comprising hepatobiliary surgeons, endosopists and interventional radiologists. Endoscopic stenting with multiple plastic stents should be chosen as first-line therapy for most cases of iatrogenic bile duct strictures. Fully covered self-expandable metal stents may be a good alternative to plastic stents, in some cases. Surgery is indicated in patients with complicated biliary and anastomotic strictures and in whom non-surgical treatments have failed. Patients with complex injuries ( vasculo-biliar injuries), secondary biliary cirrhosis and portal hypertension are good candidat to the liver transplantation. Implementation of novel technologies increases expectations for improved treatment options in future.*

**Keywords**
*iatrogenic bile duct strictures, cholecystectomy, endoscopic treatment, Roux-en Y hepaticojejunostomy, novel technologies*

## Холецистэктомиядан кейінгі өт жолдарының ятрогенді стриктуралары

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***Аңдатпа***

*Өт жолдарының қатерсіз структуралары әр түрлі себептермен болуы мүмкін, бірақ жағдайлардың шамамен 80% -ы лапароскопиялық немесе ашық холецистэктомия кезінде ятрогенді жарақатқа байланысты. Лапароскопиялық холецистэктомияны кеңінен қолданғаннан кейін, өт жолдарының ятрогенді зақымдану жилігі ашық холецистэктомиямен салыстырғанда екі-төрт есе артты. Холецистэктомиядан кейін ятрогенді билиарлы стрикураны емдеу қиын және мультидисциплинарлы әдісті қажет етеді, соның ішінде гепатобилиарлы хирургтар, эндоскопистер және интервенциялық рентгенологтар. Көптеген пластикалық стенттерді қолданатын эндоскопиялық стенттеу өт жолдарының струстық ятрогенді стриктураларының көпшілігінде бірінші кезектегі терапия ретінде таңдалуы керек. Хирургиялық емдеу хирургиялық емес емдеу сәтсіздікке ұшыраған күрделі билиарлы және анастомозды стриктуралары бар науқастарға көрсетілген. Бауыр трансплантациясы үшін күрделі жарақаттармен (васкуло-билиарлы жарақат), екінші дәрежелі билиарлы цирроз және портальды гипертензиямен ауыратын науқастар жақсы үміткерлер болып табылады. Жаңа технологияларды енгізу болашақта емдеу әдістерінің жақсаруына үміт артады.*

**Түйін сөздер**
*өт жолдарының ятрогенді стриктуралары, холоцистэктомия, эндоскопиялық емдеу, гепатикоежуностомия, жаңа технологиялар*

# Ятрогенные стриктуры желчных протоков после холецистэктомии

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***Аннотация***

*Доброкачественные стриктуры желчевыводяших протоков могут возникать в результате разных причин, но примерно 80% случаев возникают вследствии ятрогенных повреждений во время лапароскопической или открытой холецистэктомии. Особенно после широкого приминение лапароскопической холецистэктомии частото ятрогенных поврождений желчных протоков увеличилась в два-четыре раза выше чем при открытой холецистэктомии. Выраженность клинических симптомов зависит от локализации стриктуры, времени травмы и септического состояния. Для потверждение диагноза и уточнение этиологии билиарных стриктур, существуют широкого спектра неинвазивные (УЗИ, компьютерная томография, магнитно-резонансная холангиопанкреатикография (МРХПГ),), и инвазивные методы исследования (внутрипротоковая УЗИ, ретроградная холангиопанкреатография). МРХПГ является «золотым стандартом» для полной оценки желчного дерево. Несмотря на различные тактики лечения, метод золотого стандарта до сих пор не определен. Лечение ятрогенных стриктур желчных путей после холецистэктомии является сложной задачей и требует мултидисциплинарного подхода, включающего гепатобилиарных хирургов, эндоскопистов и интервенционных радиологов. Эндоскопическое стентирование с использованием нескольких пластиковых стентов следует выбирать в качестве терапии первой линии для большинства случаев ятрогенных стриктур желчных протоков. В некоторых случаях покрытые саморасширяющиие металлические стенты могут быть хорошей альтернативой пластиковым стентам. Хирургическое лечение показана пациентам со сложными билиарнымы и анастомозными стриктурами, у которых нехирургическое лечение не принесло результатов. Пациенты с сложными травмами (васкуло-билиарными повреждениями), вторичным билиарным циррозом и портальной гипертензией являются хорошими кандидатами для трансплантации печени. Внедрение новых технологий повышает ожидания в отношении улучшенных вариантов лечения в будущем.*

**Ключевые слова**
*ятрогенные стриктуры желчных протоков, холоцистэктомия, эндоскопическая лечение, гепатикоеюноанастомоз, новые технологии*

## Introduction

Generally, bile duct strictures can be classified as malign or benign. Nearly two- third of biliary strictures have malign nature [1]. The most common causes of malignant biliary strictures are the cholangiocarcinoma, pancreatic adenocarcinoma (>90%), gallbladder cancer and hepatocellularcarcinoma (10%) [1,2]. Up to 30% of patients have non-malignant–benign biliary strictures. Benign causes of biliary strictures (BBS) include primary sclerosing cholangitis, chronic pancreatitis, autoimmun diseases such as Ig-4 related sclerosing cholangitis and some abdominal operations (gastroectomy, liver transplantations, pancreatic resection etc.) [3,4]. (table 1) But approximately more than 80% BBS occur, during cholecystectomy as result of direct surgical trauma from partial or comple transection by clipping or ligation of the bile duct, thermal injury or vascular damage [5,6]. After widespread application of laparoscopic cholecystectomy the incidence of iatrogenic bile duct injuries has increased two-four times higher than recorded in open cholecystectomy [2,5,6]. The main reason of increased incidence during LC, is the acute or chronic inflammation around gallbladder, blind or excessive use of electrocautery, bleedings and due it inaccurate placement of clips, sutures and ligations [6,7]. The most of strictures after laparoscopic cholecystectomy occur near the confluence zone, more commonly in the common hepatic duct [8,9].

### Clinical presentation

Iatrogenic bile duct strictures (IBDS) can present with heteregenous clinical signs,from abdominal pain with mild elevation of liver enzymes to jaundice, recurrent cholangitis, portal hypertension and due it biliary cirrhosis [2,10]. The severity of clinical symptoms depends on stricture localization, the time of injury and septic condition [11]. The most common location of IBDS include the junction of the cystic duct with the common hepatic duct (CHD) and the confluence of right and left hepatic ducts (Strasberg E4 type). Unfortunately in contrast acute transection or cutting injury, most of benign strictures go unrecognized at the time of surgery (>75% cases) [11,12].

**Diagnosis**

Labaratory tests. Abnormal liver function tests including conjugated hyperbilirubinemia, serum alkaline phosphatase levels and gamma glutamyltransferase levels are elevated in the majority (65%) of patients with IBDS [3,13]. For distinguishing between malignant and benign strictures can be used tumor markers such as serum Ca 19,9 and carcinoembryonic antigen (CEA) level [14,16.16].

**Imagine techniques**

There are broad spectrum non- invasive and invasive (ERCP, IDUS. CLE) imaging techniques for confirming diagnosis and clarifying the etiologies of biliary strictures. The non- invasive tests include ultrasonography- US, computed tomography (CT) and magnetic resonance (MR)5. The abdominal US is the simpliest imaging way which can detect intrahepatic and extrahepatic bile duct dilatations and any associatedhni vascular lesions. The main advantages of US is its low cost, avaliability , safety and high sensivity (nearly 100%) in detecting the level of obstruction [17]. But it is a poor imaging tool for diagnosing the cause of strictures or any masses.

Abdominal cross-sectional imaging tests ( MRCP, CT) are very useful for initial evaluation of patients. Recently the development of multidetector CT scanners allows to define the biliary obstruction with upstream dilatation, the results of long-standing strictures such as lobar atrophy or biliary cirrhosis. It also helps to identify vascular lesions and gives some information about etiology of lesions based on rate of the contrast uptake and clearce by focal lesions [5,17,18]. The majority of recent studies has shown a sensitivity of 75-80% and specificity 60-80% for predicting the nature of biliary strictures using CT images [3,17,19].

At the moment MRCP is the "gold standart " for the complete evaluation of the biliary tree. The main advantages of this diagnostic tool are the lack of ionizing, providing high quality cholangiograms which can correctly determine the level, length and morphology of biliary strictures [20,21]. These information helps to make a "road map" for futher preprocedure plan(endoscopic and/or percutaneous interventions) [2,22]. A meta-analysis including 4711 patients with biliary strictures demonstrated that MRCP has sensitivity and specificity 98% in determining level of obstruction, also 38-90% sensitivity and 70-85% specificity for 8distinguishing benign from malignant strictures [23]. Also MRCP is useful for the patients with anastomotic strictures than endoscopic retrograde cholangiopancreatography (ERCP) due to altered post-surgical anatomy.

In nowdays, the role of ERCP as a diagnostic technicque is llimited, but it has great advantages over MRCP because of ERCP allows for tissue sampling using biliary brushings or endoscopic intraductal biopsies and fine needle aspiration (FNA) [24]. Despite this advantage the biliary brushings and biopsies which obtained during ERCP has poor sensitivity (41.6%) and negative predictive value (58%) [25]. Therefore, for increasing diagnostic value can be used endoscopic ultrasound fine needle aspiration (EUS-FNA), intraductal ultrasound (IDUS) flurescent in-situ hybridization (FISH) and confocal laser endomicroscopy (CLE) [26,27,28,29]. In patients with distal biliary strictures EUS-FNA can help to identify benign and also malign lesions because up to 40% of malign masses may be missed on CT scan [30]. IDUS may be recommended in patient with proximal and mid-bile duct strictures for differentiating benign from malign masses [31]. With collobration of these newer techniques can be achieved higher diagnostic results in patients with indeterminate biliary strictures.

**Table 1.**
Etiology of biliary strictures

| Malign | Benign | | |
|---|---|---|---|
| | **Iatrogenic** | **Inflammotory** | **Other** |
| pancreatic adenocarcinoma | cholecystectomy (open or laparoscopic) | acute or chronic pancreatitis | Mirizzi syndrome |
| cholangiocarcinoma | liver transplantation | primary or secondary sclerosing cholangitis | ischemia |
| hepatocellularcarcinoma | gastroectomy | IgG4-related cholangiopathy | vasculitis |
| gallbladder cancer | Pancreatic resection | eosinophilic cholangiopathy | papillary stenosis |
| metastatic disease with external compression | bilioenteric anastomosis etc. | 3ffectiv infections (HIV, tuberculosis, viral, parasitis) | blunt abdominal trauma |
| | radiation therapy | | |
| | transarterial chemoembolization | | |

**Management tactics**

**Perioperative assesment**

Successful treatment requires a correct assessment of current patients condition with IBDS. Because, most of patients with IBDS have a history of multiple interventions and complications, even life-threatening conditions such as cholangitis, liver abscesses or bile peritonitis which can leads to malnutrition [32]. Complicated IBDS may be associated with portal hypertension and secondary biliary cirrhosis which can caused gastrointestinal bleedings from esophageal varices [33]. In cases with recurrent variceal bleeding transjugular intrahepatic portosystemic shunting (TIPS) can be better choice , because of it is associated with a high success rate ( nearly 90–100 % ) [34]. For achivement better results it is very important to find and treat all complications on time.

**Endoscopic treatment**

Recently endoscopic biliary stenting is feasible approach for IBDS despite surgery is considered method for these patients. Endoscopic options can be performed in patients in whom the bile duct has not transected or ligated and it is carried out by placement of multiple large-bore plastic stents with trimonthly exchange for a one year [35]. Severe fibrotic strictures require firstly 4ffecti or bougie dilatation, following placement of multiple large plastic stents or FCSEMS [36,37]. Studies indicate the rate of stricture recurrence is around 20% all of occuried in 2 years after stent removal [38]. In the study of Parlak et al. stricture reccurrence was seen in 18 patients (11%) out of 156 patients [39]. However, in the study of Costomagna et all.with the longest follow-up (13 year) reported no cases of recurrence with the use of a more aggressive approach (up to 6 stents) [40]. By the same group of authors in a cohort extended study of 164 patients with IBDS were reported 9.3% stricture rate after a mean follow-up 7 year (over 22 year- period) [41]. The utility of a fully covered self-expandable metal stents (FCSEMS) in patients with post- cholecystectomy strictures are limited due high stent migration rate [42,43].

The role of endoscopic treatment in patients with recurrent strictures after hepaticojejunostomy is very challenging due to altered anatomy. Despite this, in the small series of Monkomuller and Fry had been achived nearly 90% of diagnostic and 60% of therapeutic success [44]. Later , other studies showed similar results [45,46]. The comparision study of 66 patients treated by endoscopic stenting and 35 patients treated by surgical therapy for IBDS, showed similar long- term success rate, with stricture recurrence occurring in 17% in both groups [47]. In the retrospective study of Tocci et.al. which compared endoscopic and surgical treatment of patients after IBDS showed similar long-term outcomes but with highest morbidity rate in patients treated endoscopically.(9 vs 2) [48].

**Percutaneous intervention**

Percutaneous transhepatic baloon dilatation (PTBD) is avaliable procedure when ERCP failed and in cases when anatomy surgically altered (such as R&Y hepaticojejunostomy) or patient has severe comorbidities. This modality requires 1-4 repeat dilatation with a period of biliary drainage nearly 3 months [48,49]. The main advantage of PTBD is its low procedural morbidity which prevalence about 11-13% and overall success rate is about 66-76% [50,51]. In a novel pilot study of Huszar et al. demonstrated percutaneous transhepatic balloon dilatation combined with targeted intramucosal corticosteroid injection in patients with IBDS . They achived 100% success rate with this terapy without any side-effect of corticosteroids [52]. Also, using PTBD as a step-up approach before surgical treatment of IBDS can give advisable results with high success rates of 98% [53].

**Surgical treatment**

Definitive management of post-cholecystectomy or iatrogenic biliary strictures is the surgical reconstruction – hepaticojejunostomy with Roux en Y limb [52,54]. Surgical treatment involves anastomosing an isolated loop of jejunum to the healthy, vascularized and unscarred part of the bile duct [54,55,56]. For the strictures on or below the confluence the most preferrable method is Hepp-Couinaud approach because of rich vascular supply of this area [57,58]. This tecnique allows to approach the left duct by the dissection of hilar plate. When biliary strictures located deep in the liver it becomes impossible draining with single anastomosis as in the Hepp- Couinaud approach [59,60]. These cases require creating double-barrel anastomosis. On the other hand in selected cases - when strictures with an associated lobar atrophy, cholangitis or if it is located too far inside liver it is recommended to perform an ipsilateral liver hepatectomy and create a hepaticojejunostomy with the opposite duct [61,62]. Patients with complex injuries ( vasculo-biliar injuries), secondary biliary cirrhosis and portal hypertension are good candidat to the liver transplantation [63].

**Novel management strategies**

Novel technologies including biodegradable stents, intraductal radiofrequency ablation, and magnetic decompression anastomosis may provide a valuable addition to the treatment options for IBDS patients, especially for the selected cases refractory to endoscopic or percutaneous methods [64]. In the study of Siiki et al. with 21 month follow-

up reported 83% stricture resolution after treatment endoscopically placed biodegradable stents [65]. In the other study treated by a percutaneously placed biodegradable stent stricture resolution rate was 100% [66]. Intraductal radiofrequency ablation also, may be useful in some cases after IBDS. The results of pilot study Hu et.al. showed 55% success rate in treatment of BBS with the intraductal radiofrequency ablation followed by baloon dilatation [67]. The other promising new technique in the treatment of IBDS is magnetic decompression anastomosis (MDA). In the study of Jang et al. using MDA biliary recanalization was achived in 89,7% of patients [68].

## Summary

In the past 3 decades laparoscopic cholecystectomy become "gold standart" as a treatment of gallstone diseases. Despite all advantages of LC the rate of biliary injury has increased also 7,8,9]. Studies suggest that about 30-60% patients with iatrogenic bile duct injury can develop IBDS [69]. The management of IBDS after cholecystectomy is challenging and requires multidisciplinary approach comprising hepatobiliary surgeons, endoscopists and interventional radiologists[49,69]. There are several treatment options for post-cholecystectomy strictures.

Surgical treatment showed highest stricture resolution rate (84%) comparing other treatment options (endoscopic treatment-79%, PTBD-75%). But in spite of better outcomes of surgery the rate of morbidity (9-58%) and mortality (5%) are still higher than other modalities [70]. Repeated surgical repair attempt significantly increased the complication rate.

European Society of Gastrointestinal Endoscopy (ESGE) recommends the use of temporary multiple plastic stents for the treatment of IBDS after cholecystectomy, a fully covered self- expandable metal stents (FCSEMS) can be an alternative for strictures located > 2cm from the main hepatic confluence [71].

In conclusion, considering all advantages of endoscopic treatment (low complication rates, easy implementation, cost- effectiveness) it should be chosen as first-line therapeutic option (with multiple plastic insertion) for most cases of IBDS. Percutaneous biliary balloon dilatation, is also safe, useful, and inexpensive for the treatment of the recurrent benign anastomotic stricture of Roux-en-Y hepaticojejunostomy. Redo- surgery is indicated in patients with complicated biliary and anastomotic strictures and in whom non-surgical treatments have failed. Despite early outcomes of novel technologies are promising, but its evaluation is still ongoing.

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# МАМЕДОВ МАГЕРРАМАЛИ МУБАТОВИЧ

30 ноября 2020 года скоропостижно скончался добрейший души человек, прекрасный педагог, хирург, заведующий отделом хирургической колопроктологии Научном центре хирургии им. М.А. Топчибашева, доктор медицинских наук, профессор Мамедов Магеррамали Мубатович.

Мамедов Магеррамали Мубатович родился в 1954 году в селе Мамаевка, Арысского района, Чимкентской области Республики Казахстан. После окончания средней школы, поступил в Ленгерское медицинское училище. В 1973 году поступил в Алма-Атинский государственный медицинский институт и в 1979 году окончил его. В 1979 году прошел интернатуру в Научно-Ис-следовательском Институте Клинической и Экспериментальной хирургии им. А.Н. Сызганова. С 1979 по 1982 г. работал в отделении хирургии печени. В 1982 году поступил в очную аспирантуру во 2 МОЛГМИ им. Н.И. Пирогова на кафедру общей хирургии. В 1985 году успешно защитил кандидатскую диссертацию на тему «Использование высокоэнергетических лазеров в хирургии внепеченочных путей». С 1985 по 1986 годы работал старшим научным сотрудником отделения пищевода, желудка и средостения в Научно-Исследовательском Институте Клинической и Экспериментальной хирургии им. А.Н. Сызганова. С 1986 по 1988 г. старший научный сотрудник отделения хирургии печени. С 1990-1992 гг. заведующий отделением лазерной хирургии. В 1992 году по семейным обстоятельствам выехал в другую республику - Азербайджан. С 1992 по 1995 г. работал врачом-хирургом в госпитале МВД Азербайджанской Республики, участвовал в военно-боевых действиях в Нагорно- Карабахском конфликте. С 1995 по 2005 г. работал заведующим отделением гнойно-септической хирургии Научного центра хирургии им. М.А. Топчибашева. В 2004 году защитил докторскую диссертацию на тему: «Комплексное хирургическое лечение полостных образований печени» в Национальном научном центре хирургии им. А.Н. Сызганова. С 1996 года член лазерной ассоциации России. С 2005 года академик Лазерной Академии Наук Российской Федерации. С 2006 года старший научный сотрудник отделения хирургии печени, желчных путей и поджелудочной железы. С 2011 года профессор, заведующий отделом хирургической колопроктологии. Автор 211 научных работ, 6 монографий, 11 патентов и 23 рационализаторских предложений.

Мамедов Магеррамали Мубатович прожил 66 лет, наполненную радостью жизни, научного поиска, достижений, общения с друзьями, любимой семьей. Он любил полнокровную жизнь, был всегда активным и доброжелательным. В сердцах коллег, друзей, родных осталась неизгладимая память о Магеррамали Мубатовиче как о прекрасном специалисте и человеке высокой нравственности.

***Коллектив АО «Национального научного центра хирургии имени А.Н. Сызганова», РОО «Казахстанское Общество Хирургов» и Редколлегия журнала «Вестник хирургии Казахстана»***

# АПСАТАРОВ ЭДИЛЬ АЙДАРХАНОВИЧ

3 января 2021 года скоропостижно ушел из жизни замечательный хирург, врач с большой буквы Апсатаров Эдиль Айдарханович.

Казахстанская хирургия богата хирургами, которые всю свою жизнь посвятили любимой профессии. Одним из таких ярких представителей является великий хирург и учитель Апсатаров Э.А., который родился 1 июня 1939 года в г. Ташкенте. В 1962 году окончил лечебный факультет Алматинского государственного медицинского института В том же году поступил в клиническую ординатуру, затем по конкурсу – в аспирантуру на кафедру факультетской хирургии Алматинского государственного медицинского института. В 1966 году защитил кандидатскую диссертацию, а в 1969 году зачислен в докторантуру Института сердечно-сосудистой хирургии им. А.Н. Бакулева, где под руководством академика РАМН СССР А.В. Покровского и академика РАН и РАМН СССР В.С. Савельева в 1972г. защитил диссертацию на соискание ученой степени «Доктора медицинских наук». С 1972 по 1986 г. Апсатаров Э.А. заведовал кафедрой хирургии Алма-Атинского института усовершенствования врачей. 1986-2004 гг. – заведующий кафедрой госпитальной хирургии АГМИ (ныне – КазНМУ им. С.Д. Асфендиярова). В 2004 году, заведовал кафедрой общей хирургии Казахстанско-Российского медицинского университета. Он автор многих монографий, учебников по хирургии и 450 научных публикаций. Под его руководством защищены 8 докторских и 26 кандидатских диссертаций. Профессор Апсатаров Э.А. - д.м.н., профессор, член Нью-Йоркской Ассоциации хирургов, Ассоциации хирургов стран СНГ, член редколлегии журнала «Хирургия им. Н.И. Пирогова» стоял у истоков внедрения лапароскопической и сосудистой хирургии в нашей стране.

***Руководство и коллектив АО «Национального научного центра хирургии имени А.Н. Сызганова», Редколлегия журнала «Вестник хирургии Казахстана» выражают глубокие соболезнование родным и близким по поводу кончины профессора Апсатарова Эдиля Айдархановича***

# ТРЕБОВАНИЯ
# ДЛЯ АВТОРОВ ЖУРНАЛА
# «ВЕСТНИК ХИРУРГИИ КАЗАХСТАНА»

**Уважаемые авторы!**

**С 1 апреля 2018 года все статьи на публикацию принимаются на государственном или русском языках с обязательным переводом всей статьи на английский язык. Статьи без версии на английском языке будут отклонены.**

**Также учитывая требования Консультативной Комиссией (CSAB) Scopus об интернационализации авторов и аудитории редколлегия журналов рекомендуют публиковать статьи в соавторстве с учеными дальнего и ближнего зарубежья.**

В журнале публикуются научные статьи и заметки, экспресс-сообщения о результатах исследований в различных областях естественно-технических и общественных наук.

Решение о публикации принимается редакционной коллегией журнала после рецензирования, учитывая научную значимость и актуальность представленных материалов. Статьи, отклоненные редакционной коллегией, повторно не принимаются и не рассматриваются. Рукописи, оформленные не по правилам, возвращаются авторам без рассмотрения.

Рукопись направляется на отзыв члену редколлегии и одному из указанных рецензентов; в спорных случаях по усмотрению редколлегии привлекаются дополнительные рецензенты; на основании экспертных заключений редколлегия определяет дальнейшую судьбу рукописи: принятие к публикации в представленном виде, необходимость доработки или отклонение. В случае необходимости рукопись направляется авторам на доработку по замечаниям рецензентов и редакторов, после чего она повторно рецензируется, и редколлегия вновь решает вопрос о приемлемости рукописи для публикации. Переработанная рукопись должная быть возвращена в редакцию в течение месяца после получения авторами отзывов; в противном случае рукопись рассматривается как вновь поступившая. Рукопись, получившая недостаточно высокие оценки при рецензировании, отклоняется как не соответствующая уровню или профилю публикаций журнала.

Авторы несут ответственность за достоверность и значимость научных результатов и актуальность научного содержания работ. Не допускается **ПЛАГИАТ** – умышленно совершаемое физическим лицом незаконное использование чужого творческого труда, с доведением до других лиц ложных сведений о себе как о действительном авторе.

Редакция принимает на рассмотрение рукописи только на английском языке, присланные через официальный сайт журнала **www.vhk.kz.**

Материал статьи – абстракт на казахском, русском и английском языках, список литературы, рисунки, подписи к рисункам и таблицы, оформляется одним файлом; дополнительно каждый рисунок оформляется в виде отдельного файла. Если пересылаемый материал велик по объему, следует использовать программы для архивирования. Все страницы рукописи, в том числе таблицы, список литературы, рисунки и подписи к ним, следует пронумеровать.

Представленные для опубликования материалы должны удовлетворять следующим требованиям:

1. Содержать результаты оригинальных научных исследований по актуальным проблемам в области физики, математики, механики, информатики, биологии, медицины, геологии, химии, экологии, общественных и гуманитарных наук, ранее не опубликованные и не предназначенные к публикации в других изданиях. Статья сопровождается разрешением на опубликование от учреждения, в котором выполнено исследование.
2. Размер статьи 7-10 страниц (статьи обзорного характера – 15-20 стр.), включая аннотацию в начале статьи перед основным текстом, которая должна отражать цель работы, метод или методологию проведения работы, результаты работы, область применения результатов, выводы (**аннотация** не менее **20** предложений (150»300 слов) - (на английском языке) через 1 компьютерный интервал), таблицы, рисунки, список литературы (через 1 компьютерный интервал, размер шрифта – 14), напечатанных в редакторе Word, шрифтом Times New Roman, поля – верхнее и нижнее – 2 см, левое –3 см, правое –1,5 см. Количество рисунков – 5-10.

Структура должна соответствовать международной формуле IMRAD, где I – introduction (вступление), M – Methods (методы), R – Results (исследование), A – и, D – conclusion+ discussion (заключение, обсуждение результатов и выводы).

Название · Отображает суть работы · Краткое · Без аббревиатур.

Необходимо официально закрепить название организации на английском и сокращение

Резюме · Структурировано · Без аббревиатур · Передает структуру статьи – Зачем (актуальность) – Какими методами? – Что получено – Как это изменило картину знаний. Именно его читают в первую очередь, только хорошее резюме может привлечь внимание!

Вступление · Актуальность работы · Какая задача поставлена · Почему

Методы · Перечисление · Если известные - дать ссылку · Если модифицировали – указать как · Описывать так что б могли повторить · Статистика!

Результаты · Допускается не хронологическое, а логическое повествование · Основные, а не все что были сделаны ·

Иллюстрируются минимально необходимыми сводными данными (исходные могут быть в дополнительных материалах)

Обсуждения • Не повторять результаты • Сопоставить полученные данные с имеющимися • Обсудить возможные причины и следствия

Функции списка литературы: • Аргументировать идею • Сопоставить с существующими аналогами • Обозначить место данного исследования • Избежать плагиата • Для журнала и ученого = признание • Часто указаны только собственные работы или очень старые (самоцитирование допускается только 10-15% от общего списка литературы) • Кочующие ошибки

Различайте • Ссылки • Список литературы • Библиография

Что могут цитировать • Книги, (монографии, главы) • Статьи научных журналов • Материалы конференций • Патенты • Диссертации • Неопубликованные данные • СМИ • Веб ресурсы (протоколы, веб странички) Источник должен быть надежным и легко доступным.

Статья начинается на английском языке. В начале, посередине страницы, идет название статьи прописными жирными буквами, название статьи должно быть коротким и емким, согласно проведенного анализа около 30-40 символов на английском языке.

Далее на следующей строчке – инициалы и фамилии авторов обычным жирным шрифтом, затем на следующей строчке – название организации(ий), в которой выполнена работа, город, страна, затем на новой строчке – адреса E-mail авторов. С красной строки идут ключевые слова **(Key words),** а на новой строчке – сама аннотация (**Abstract** – не менее **150** и более **300 слов**).

Далее, после отбивки одной строки, начинается на русском языке. В начале статьи вверху слева следует указать индекс **УДК, МРНТИ.**

Затем, посередине страницы, пишется: 1) название статьи; 2) авторы; 3) название организации; с красной строки – **Ключевые слова,** затем – **Аннотация** (оформление шрифтов, как на английском языке).

Отбиваем одну строку и начинается сама **статья.** Следом за статьей идет список **Литературы.** Ссылки на литературные источники даются цифрами в прямых скобках по мере упоминания (не менее 20).

**Для каждой статьи обязателен DOI (Digital Object Identifier)** - это цифровой идентификатор документа. DOI выполняет функцию гиперссылки, которая всегда помогает найти нужный документ, даже если сайт, где он находился ранее, был впоследствии изменен. Благодаря этому индексу поиск научной информации в Интернете стал проще и эффективнее. Каждое издание, журнал размещает на своих веб-страницах в интернете, как текущие, так и архивные номера, и материалы. Таким образом, в открытом доступе можно увидеть резюме, которые включают в себя название статьи, фамилию, имя, отчество автора, аннотацию и ключевые слова, место выполнения работы, а также выходные данные опубликованных статей (название журнала, год издания, том, номер, страница).

**Список литературы оформляется следующим образом:**

В ссылках на книги указывается ISBN (10- или 13-значный). Сокращаются названия только тех журналов, которые указаны: http://images.webofknowledge.com/WOK46/help/WOS/0-9_abrvjt.html.

Для всех ссылок на статьи, опубликованные в международных рецензируемых журналах следует указывать DOI (Digital Object Identifier). DOI указываются в PDF версии статьи и/или на основной интернет-странице статьи, также можно воспользоваться системой поиска CrossRef: http://www.crossref.org/guestquery/. Ниже приводятся примеры оформления ссылок:

**Статья в международном журнале:**

1. Campry TS, Anders T. (1987) SNAP receptors implicated in vesicle targeting and fusion, Environ Pollut, 43:195-207. DOI: 10.1016/0269-7491(87)90156-4 (in Eng)

**Статья в русскоязычном журнале,** не имеющая англоязычной версии:

2. Ivanova TV, Samoilova NF (2009) Electrochemical Energetics [Elektrohimicheskaya energetika] 9:188-189. (In Russian)

**Книги:**

Timrat TA (2008) Soil pollution: origins, monitoring and remediation, second edition. Springer, Germany. ISBN: 978-3-540-70777-6

**Материалы конференции:**

Monin S.A. (2012) Treatment techniques of oil-contaminated soil and water aquifers. Proceedings of International Conference on Water Resources and Arid Environment, Riyadh, Saudi Arabia. P.123.

**Патенты:**

Barin AB, Mukamedzhan NT (2000) A method for determination of 1,1-dimethylhydrazine and nitrosodimethylamine [Metodopredeleniya 1,1-dimetilgidrazina initrosodimetilamina]. Preliminary Patent of the Republic of Kazakhstan [Predvaritelnyi patent Respubliki Kazakhstan]. (In Russian)

**Стандарты, ГОСТы:**

RMG 61-2003. Indexes of accuracy, precision, validity of the methods of quantitative chemical analysis, methods of evaluation [GSI.Pokazatelitochnosti, pravilnosti, retsizionnosti metodik kolichestvennogo himicheskogo analiza. Metodyiotsenki]. Moscow, Russia, 2003. (In Russian)

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В конце статьи дается резюме на казахском языке. Оформляется аналогично русскому варианту. Посередине страницы пишется: 1) название статьи; 2) авторы; 3) название организации; с красной строки – **Өзекті сөздер,** после – **Аннотация.**

Последняя страница подписывается всеми авторами, ставится дата.

3. Статьи публикуются только на английском языке.

4. В случае переработки статьи по просьбе редакционной коллегии журнала датой поступления считается дата получения редакцией окончательного варианта. Если статья отклонена, редакция сохраняет за собой право не вести дискуссию по мотивам отклонения.