ISSN 2306-5559 (print)
ISSN 2410-938X (online)

www.vhk.kz

А.Н.Сызғанов
атындағы
ҰЛТТЫҚ
ҒЫЛЫМИ ХИРУРГИЯ
ОРТАЛЫҒЫ

№ 2 (63) 2020

ҚАЗАҚСТАН ХИРУРГИЯСЫНЫҢ ХАБАРШЫСЫ

ВЕСТНИК ХИРУРГИИ КАЗАХСТАНА

BULLETIN OF SURGERY IN KAZAKHSTAN

АЛМАТЫ /ALMATY

№ 2 (63) 2020
Издается с 2005 г.
ISSN 2306-5559 (print)
ISSN 2410-938X (online)

ҚАЗАҚСТАН ХИРУРГИЯ ХАБАРШЫСЫ
ВЕСТНИК ХИРУРГИИ КАЗАХСТАНА
BULLETIN OF SURGERY IN KAZAKHSTAN

әр тоқсанда шығып тұратын А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығының ғылыми-тәжірибелік журналы
ежеквартальный научно-практический журнал Научного центра хирургии им. А.Н. Сызганова
a quarterly scientific-practical journal of the National Scientific Center of Surgery named after A.N. Syzganov

Журнал ҚР ақпарат, мәдениет және спорт Министрлігінде тіркелген.
«Қазақстан хирургиясының хабаршысы» ҚР ҒБМ Ғылым және білім саласындағы бақылау комитеті ұсынған Ғылыми еңбектің негізгі нәтижелерін жариялау үшін ұсынатын ғылыми баспалар тізбесі енгізілген.
Тіркеу нөмірі 5564-Ж.
Журналдың иесі – «А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығы» АҚ.
Баспаның мекен-жайы:
050004, Алматы қ., Желтоқсан көш. 62,
тел. 7(727) 2795306
http://vhk.kz, e-mail: kaz.vestnik@mail.ru
Әрленім және беттеу:
«*ДАНиЛЕНКО*» ЖК-де дайындалған,
Алматы қ., Чайковский көш. 23-3,
тел. 7(727) 2780172
Таралымы – 500 дана
Корректор: Нургалиева А.Н.
e-mail: aigul.nur10792@mail.ru
тел: 87786690021
Жарияланатын мақалалардың мазмұнына авторлар жауапты.
ҚАЗПОЧТА жазылу индексі – 75327

Журнал зарегистрирован в Министерстве информации, культуры и спорта РК.
Журнал включен в перечень научных изданий, рекомендуемых Комитетом по контролю в сфере образования и науки МОН РК
Регистрационный номер: 5564-Ж.
Владелец журнала - АО «Национальный научный центр хирургии имени А.Н. Сызганова».
Адрес редакции:
050004, г. Алматы, ул. Желтоксан, 62,
тел. 7 (727) 2795306
http://vhk.kz, e-mail: kaz.vestnik@mail.ru
Дизайн и верстка:
ИП «*ДАНиЛЕНКО*»,
г. Алматы, ул. Чайковского, 23-3,
тел. 7 (727) 2780172
Тираж – 500 экз.
Корректор: Нургалиева А.Н.
e-mail: aigul.nur10792@mail.ru
тел: 87786690021
Ответственность за содержание публикуемых материалов несут авторы.
Подписной индекс КАЗПОЧТЫ – 75327

The journal is registered with the Ministry of Information, Culture and Sports of the Republic of Kazakhstan.
The "Bulletin of Surgery in Kazakhstan" is included in the list of scientific publications recommended by the Committee for Control of Education and Science, Ministry of Education and Science of Kazakhstan.
Registration number: 5564-Ж
The owner of the journal - JSC «National scientific center of surgery named after A.N. Syzganov»
Editorial address:
62, Zheltoksan street, Almaty, 050004
tel. 7 (727) 2795306
http://vhk.kz, e-mail: kaz.vestnik@mail.ru
Design and lead out:
«*ДАНиЛЕНКО*» SP,
23, Tchaikovsky street, apt.3, Almaty,
tel. 7 (727) 2780172
Edition – 500 copies.
Corrector: Nurgalyeva A.N.
e-mail: aigul.nur10792@mail.ru
tel: 87786690021
The authors are responsible for the content of published materials.
Subscript index of KAZPOST – 75327

МАЗМҰНЫ

ДИАГНОСТИКА ЖӘНЕ ЕМДЕУ

ХИРУРГИЯ

СОДЕРЖАНИЕ

ДИАГНОСТИКА И ЛЕЧЕНИЕ

ХИРУРГИЯ

CONTENTS

DIAGNOSTICS AND THREATMENT

SURGERY

МАЗМҰНЫ

МРНТИ 76.29.30

SOME ASPECTS OF REGIONAL BLOOD CIRCULATION STIMULATION BY INDIRECT REVASCULARIZATION IN PATIENTS WITH CRITICAL LIMB ISCHEMIA ON THE BACKGROUND OF DISTAL STENO-OCCLUSION OF ARTERIES

Kosaev J.V., Abushov N.S., Namazov I.L., Babaev N.I.
Scientific Center of Surgery named after M.A. Topchubashev, Baku, Azerbaijan

ABOUT THE AUTHORS

Kosayev J.V. *– Principal scientist of angiology department. PhD.*
E-mail: jvkosayev@mail.ru

Abstract

Objective: *To study the peculiarities of regional blood circulation stimulation by indirect revascularization in patients with critical limb ischemia (CLI) on the background of distal steno-occlusion of arteries.*

Materials and methods: *study was carried out in 210 patients with CLI on the background of distal steno-occlusion of arteries. 48 patients conducted standard treatment (control group). Regional blood flow was stimulated in 42 patients with a standard operation of revascularizing osteotrepanation (ROT) (group I), in 51 patients with lumbar sympathectomy (LSE) (group II), in 38 patients - LSE + ROT (group III), in 31 patients - modified with intraosseous laser irradiation (ROT with IOLI) (IV group). The following indicators of arterial and venous blood flow were determined: rheographiy index (RI), linear blood flow velocity (LBV) in the popliteal artery, standing and lying, regional systolic pressure (RSP) standing and lying, regional systolic pressure gradient (RSPG), post-occlusal venous pressure (POVP) standing and lying, the gradient of post-occlusal venous pressure (GPOVD), venous arterial flow index (VAFI) standing and lying. Oxygen saturation of skin (OSS) in the distal part of the foot was also studied. The parameters of regional arterial and venous blood circulation were compared with identical parameters of 48 practically healthy individuals ("reference group").*

Results: *upon admission to the clinic, patients revealed a sharp violation of the arterial and venous parts of the regional macro- and microhemodynamics. Indirect methods of revascularization, in comparison with the initial data, reliably mobilize regional blood circulation, reduce the degree of chronic ischemia, which is accompanied by an increase in the number of patients with significant and moderate improvement in clinical status. Statistical analysis showed that the mobilization of arterial and venous blood flow reliably depends on the method of stimulation ($p < 0.05$ -0.001). In the I and II group of patients, a weak correlation was revealed ($r = 0.3$), and in the III and IV group of patients, a moderate correlation was found ($r = 0.5$-0.6). Leveling of RI, LBV and OSS parameters reliably ($p < 0.05$-0.001) depends on the method of blood circulation stimulation with weak ($r = 0.3$) correlation in group I patients and moderate ($r = 0.4$-0.6) correlation in II, III, IV groups of patients. These positive results were most pronounced in patients who underwent ROT surgery with IOLI.*

Conclusion: *stimulation of peripheral blood flow by indirect methods of revascularization is reasonable ($p < 0.05$-0.001 with $r = 0.3$-0.4-0.5-0.6), if shunt operations in patients with CLI on the background of distal steno-occlusion of arteries is not possible to perform, allowing you to maintain the supporting function of the limb and improve the quality of life.*

Keywords
distal artery occlusion, critical lower limb ischemia, stimulation of regional hemodynamics, indirect revascularization.

Қатерлі ишемиясы бар науқастарға жанама реваскуляризациялық аймақтық қанайналым стимуляциясының кейбір аспектілері

Косаев Дж.В., Абушов Н.С., Намазов И.Л., Бабаев Н.И.
Академик М.А. Топчубашев ат. Ғылыми хирургия орталығы, Баку, Әзірбайжан

АВТОРЛАР ТУРАЛЫ

Косаев Джамаладдин Вахид оглы *– м.ғ.к., тамыр хирургиясы бөлімшесінің Бас ғылыми қызметкері*
E-mail: jvkosayev@mail.ru
Жұмыс телефоны: +994558911434;
Ұялы телефон: +994502166090

Аңдатпа

Мақсаты: *Артерияның дисталды стено-окклюзиялы фонындағы аяқтардың қатерлі ишемиясы (АҚИ) бар науқастардағы жанама реваскуляризацияның регионарлы қанайналым стимуляциясы ерекшеліктерін зерттеу.*

Зерттеу материалдары және әдістері. *Артерияның дисталды стено-окклюзиялық фонында АҚИ-ы бар 210 науқасқа зерттеу жүргізілді. 48 науқасқа стандартты ем (бақылау тобы) жүргізілді. Регионарлы қанайналым стимуляциясы 42 науқасқа (РОТ) (I топ) реваскуляризациялық остеотрепанация (РОТ) (I топ), 51 науқасқа - бел симпатэк-*

томиясы (БСЭ) (II топ), 38 науқасқа – БСЭ+РОТ (III топ), 31 науқасқа сүйек кемігі ішілік лазерлік сәулелендірумен модификацияланған (СКЛС пен РОТ) (IV топ) стандартты операциясы жасалды. Мынадай артериялық және веноздық қанайналым көрсеткіштері анықталды: реографиялық индекс (РИ), тақым артериясындағы қанның желілік жылдамдығы (ҚЖЖ), түрегеп тұрғандағы және жатқандағы регионарлы систолалық қысым (АСҚ), регионарлы систолалық қысым градиенті (АСҚГ), түрегеп тұрғандағы және жатқандағы постокклюзиялық веноздық қысым (ПОВҚ), посткокклюзиялық веноздық қысым градиенті (ПОВҚГ), түрегеп тұрғандағы және жатқандағы веноздық-артериялық индекс (ВАИ). Сондай-ақ табанның дисталды бөлігіндегі теріні оттекпен сатурациялау (ТОС) зерттелді. Регионарлы артериялық және веноздық қанайналым параметрлері 48 дені сау тұлғалардың («референс тобы») сәйкес параметрлерімен салыстырылды.

Нәтижелері: *емханаға түскен науқастарда регионарлы макро- және микрогемодинамиканың артериялық және веноздық бөлімінің күрт бұзылысы бар екені анықталды. Бастапқы деректермен салыстырғанда, реваскуляризацияның жанама әдістері регионарлы қанайналымды нақты мобилизациялайды, созылмалы ишемия дәрежесін төмендеді, клиникалық мәртебесі бірқалыпты және айтарлықтай жақсарған науқастардың саны артқаны байқалды. Статистикалық талдау артериялық және веноздық қанайналымның мобилизациясы стимуляция әдісіне (p<0,05 -0,001) тікелей байланысты. Науқастардың I және II тобында әлсіз корреляциялық байланыс (r=0,3), науқастардың III және IV тобында бірқалыпты корреляциялық байланыс (r=0,5-0,6) анықталды. РИ, ҚЖЖ және ТОС көрсеткіштерін нақты нивелирлеу (p<0,05 -0,001) науқастардың I тобындағы әлсіз (r=0,3) корреляциялық және науқастардың II, III, IV тобындағы бірқалыпты (r=0,4-0,6) корреляциялық қанайналым стимуляциясы әдісіне байланысты. Осындай оң нәтижелер СКЛС арқылы РОТ операцияларын өткерген науқастарда көбірек байқалды.*

Түйін: *Артерияның дисталды стено-окклюзиясы кезінде АҚИ-ы бар науқастарға операция жасау мүмкін емес болған жағдайда, өмір сапасын жақсартатын, аяқтардың тірек қызметін сақтауға көмектесетін (p<0,05-0,001r=0,3-0,4-0,5-0,6) жанама реваскуляризация әдістері арқылы перифериялық қанайналымның стимуляциясы негізгі әдіс болып саналады.*

Түйін сөздер

артерияның дисталды окклюзиясы, аяқтардың қауіпті ишемиясы, регионарлы гемодинамика стимуляциясы, жанама реваскуляризация.

Некоторые аспекты стимуляции регионарного кровообращения непрямой реваскуляризацией у больных критической ишемией нижних конечностей на фоне дистальной стено-окклюзии артерий

ОБ АВТОРАХ

Косаев Джамаладдин Вахид оглы
– к.м.н., Главный науный сотрудник отделени я сосудистой хирургии
E-mail: jvkosayev@mail.ru
Рабочий телефон: +994558911434;
Мобильный телефон: +994502166090

Косаев Дж.В., Абушов Н.С., Намазов И.Л., Бабаев Н.И.
Научный Центр Хирургии им. акад.М.А. Топчубашева, Баку, Азербайджан

Аннотация

Цель: *Изучить особенности стимуляции регионарного кровообращения непрямой реваскуляризацией у больных с критической ишемией нижних конечностей (КИНК) на фоне дистальной стено-окклюзии артерий.*

Материал и методы исследования: *исследования проводились у 210 больных больных с КИНК на фоне дистальной стено-окклюзииартерий.У 48 больных проведена стандартное лечение (контрольная группа). Стимуляция регионарного кровотка у42 больных была проведена стандартной операцией реваскуляризирующей остеотрепанации (РОТ) (I группа), у 51 больного –поясничной симпатэктомией (ПСЭ) (II группа), у 38 больных – ПСЭ+РОТ (III группа), у 31 больного – модифицированной с внутрикостномозговым лазерным облучением (РОТ с ВКЛО)(IV группа).Были определены следующие показатели артериального и венозного кровотока: реографический индекс (РИ), линейная скорость крови (ЛСК) в подколенной артерии, регионарное систолическое давление (РСД) стоя и лёжа, градиент регионарного систолического давления (ГРСД), постокклюзионное венозное давление (ПОВД) стоя и лёжа, градиент постокклюзионного венозного давления (ГПОВД), венозно-артериальный индекс (ВАИ) стоя и лёжа. Также была изучена сатурация кожи кислородом (СКК)) в дистальной части стопы. Параметры регионарного артериального и венозного кровообращения сравнивали с идентичными параметрами 48 практически здоровых лиц («референсная группа»).*

Результаты: *при поступлении в клинику у больных выявлено резкое нарушение артериального и венозного звеньев регионарной макро- и микрогемодинамики. Непрямые методы реваскуляризации , в сранении с исходными данными, достоверно мобилизуют регионарное кровообращение, снижает степень хронической ишемии ,что сопровождается увеличением число больных со значительным и умеренным улучшением клинического статуса. Статистический анализ показал, что мобилизация артериального и венозного кровотока достоверно (p<0,05 -0,001) зависит от метода стимуляции. В I и II группе больных была выявлена слабая корреляционная связь (r=0,3), а в III и IV группе больных – умеренная корреляционная связь (r=0,5-0,6).Нивелирование показателей РИ,ЛСК и СКК достоверно (p<0,05 -0,001) зависить от метода стимуляции кровообращения с слабой((r=0,3) корреляцией в I группе больных и умереннной (r=0,4-0,6) корреляцией в II, III, IV группах больных. Эти положительные результаты наиболее были выражены у больных, перенесших операцию РОТ с ВКЛО.*

Вывод: *при невозможности выполнения шунтабельных операций у больных с КИНК при дистальной стено-окклюзии артерий стимуляция периферического кровотока непрямыми методами реваскуляризации является обоснованной (p<0,05-0,001 при r=0,3-0,4-0,5-0,6), позволяющие сохранить опорные функцию конечности с улучшением качества жизни.*

Ключевые слова

дистальная окклюзия артерий, критическая ишемия нижних конечностей, стимуляция регионарной гемодинамики, непрямая реваскуляризация.

Surgical treatment of patients with critical lower limb ischemia (CLI), caused by lesions of the arteries of infrainguinal localization, remains an urgent problem of vascular surgery and angiology, the search for solutions to this issue continues (3.4). Specialists from far and near abroad reconstructive surgery, endovascular interventions and hybrid operations are considered as the main methods of surgical treatment of patients with CLI. However, the results of direct limb revascularization in patients with CLI, due to occlusion of the femoral-popliteal-tibial segment, do not always satisfy surgeons and patients, as it is often complicated by early reocclusion of the reconstructed segment with relapse and exacerbation of critical ischemia (7, 10, 12, 16, 17). These circumstances led vascular surgeons and specialists from other branches of medicine to look for other methods of stimulating peripheral circulation in patients with CLI distal artery damage. In the presence of contraindications for shunt operations for limb preservation, as an alternative to amputation, revascularizing osteotrepanation (ROT) (classic and modified), lumbar sympathectomy (LSE), revascularizing corticotomy, prolonged tunneling are used (6, 7, 9, 11, 15). A differentiated approach to direct and indirect revascularization is recommended (4.8).

To detect circulatory disorders and evaluate the effectiveness of stimulation of peripheral hemodynamics in patients with CLC, especially after indirect revascularization, along with X-ray contrast methods, it is recommended to use non-invasive research methods (1, 2, 11, 13).

Purpose

To study the features of regional blood circulation stimulation by indirect revascularization in patients with CLI on the background of distal steno-occlusion of arteries.

Materials and methods

A prospective controlled clinical trial was conducted. To conduct this study, permission from the Ethics Committee of the Scientific Center for Surgery named after M.A. Topchubashov was obtained. All patients were acquainted with all aspects of surgical treatment before starting treatment and signed the corresponding informed consent before being included in the study.

The study was conducted in 210 patients, aged 28 to 74 years, with critical limb ischemia on the background of distal steno-occlusion of arteries, who were hospitalized at the Department of Vascular Surgery of the National Surgery Center named after M.A. Topchubashov. 146 (69.5%) patients were in active working age. Men - 154 (73.3%), women - 56 (26.7%). The duration of critical ischemia development ranged from 2 months up to 4 years. In 70 (33.3%) patients, III degree was diagnosed, in 140 patients, IV degree of chronic ischemia. Etiological factors for the development of critical ischemia were atherosclerosis obliterans [142 (67.7%)] and thromboangiitis obliterans [68 (32.4%)]. The reason for the development of critical ischemia was the unreconstructive occlusion of the femoral-popliteal-tibial and tibial-foot segments of the arteries. Among the concomitant diseases, arterial hypertension (145), coronary heart disease (157), chronic cerebrovascular disorder (59%), diabetes mellitus (86), chronic obstructive pulmonary disease (48), gastric ulcer and duodenal ulcer (22), chronic renal failure (22) were revealed.

In 48 patients with CLI, due to the inability to perform direct revascularization in case of patient's refusal or contraindications for indirect revascularization, conservative treatment was performed. The following indirect revascularization operations were performed: ROT for 42 patients, LSE for 51 patients, ROT + LSE for 38 patients, ROT with intraosseous laser irradiation (IOLI) in 31 patients. Operations of ROT, ROT with IOLI were performed under epidural or spinal anesthesia, LSE under intubation anesthesia, LSE + ROT under intubation anesthesia + epidural anesthesia.

To establish a diagnosis of CLI and evaluate blood circulation stimulation, clinical and instrumental studies were carried out: determination oxygen saturation of skin (OSS) in the distal part of the foot, rheovasography, ultrasound dopplerography, ultrasound duplex scanning, and multispiral computed tomographic angiography. Using instrumental research methods, the following arterial and venous blood flow parameters were determined: rheographic index (RI), linear blood flow velocity (LBV) in the popliteal artery, regional systolic pressure (RSP) standing and lying, regional systolic pressure gradient (RSPG), post-occlusive venous pressure (POVP) standing and lying, post-occlusal venous pressure gradient (POVPG), venous arterial flow index (VAFI) standing and lying. The state of regional arterial and venous blood flow was studied upon admission of patients to the clinic and at the end of inpatient treatment. The parameters of regional arterial and venous blood circulation were compared with the identical parameters of 48 practically healthy individuals (the "reference group").

The obtained data were processed with the calculation of the arithmetic mean (X), its average error (s_x), correlation coefficient (r) and Pearson's agreement criterion (x^2) at a confidence level of P = 0.95 ($p < 0.05$) and an accuracy index (C_{sx}) 6.0-9.0% (14).

Results and discussion

Upon admission to the clinic, the general condition of patients was assessed as severe or moderate. All patients had edema of the shin, 140 patients with IV degree of chronic ischemia showed necrotic changes in the soft tissues, necrotic wounds on the fingers, dry gangrene of the fingers or only the distal part of the foot, non-healing foot wound after a previous operation. For pain relief, injections of narcotic analgesics were used, and epidural blockade was performed. After preoperative preparation for 4-5 days, indirect revascularization was performed for patients to stimulate blood flow.

A comparison of clinical results with the control group showed that the number of observations with a significant and moderate improvement in the condition of patients with a decrease in degree of chronic ischemia and transition to mild degree is significantly greater in patients undergoing indirect revascularization operations. In the control group, in 14 patients, despite the standard treatment, due to the aggravation of critical ischemia, small and large amputations were performed, in patients who underwent ROT, LSE, LSE + ROT and ROT with IOLI, such operations were performed respectively in 6, 8, 5 and 2 patients.

The results of the study of regional arterial and venous blood circulation upon admission to the clinic and at the end of inpatient treatment are shown in table No.1. As can be seen from the table, in patients with critical limb ischemia upon admission to the clinic, in comparison with the reference group, there was a sharp violation of almost all indicators of both parts of the blood circulation. Thus, standing RSP decreased by 31.9-33.1% ($p < 0.05$), lying RSP - by 62.7 - 64.4% ($p < 0.05$), lying POVP - by 21.8- 28.7% ($p < 0.05$), POVG standing increased by 25.6 - 26.9% 26.2% ($p < 0.05$), 26.9% ($p < 0.05$), 25, 85 ($p < 0.05$), 26.4% ($p < 0.05$) and 25.6% ($p < 0.05$), VAFI standing - by 84.2 - 89.2% ($p < 0$, 05), VAFI lying - 92.5-109.4% ($p < 0.05$).

Upon admission to the clinic, an increase in RSPG by 79.0 - 90.0% ($p < 0.05$) and POVPG by 60,0 - 76.3% ($p < 0.05$) was observed. It should be noted that the nature and degree of the revealed violations of arterial and venous blood circulation are largely identical with the results obtained in studies of other authors (10). Upon admission to the clinic in patients with CLI of both groups, the value of the RSP standing and lying significantly decreases, but at the same time, the RSPG significantly increases to 1.85-1.86. Simultaneously with the decrease in RSP standing and lying, the lying POVP decreases,

Table 1.
The dynamics of arterial and venous blood flow in patients with CLI on the background of distal steno-occlusion as a result of stimulation of blood circulation by indirect revascularization ($X \pm s_x$; $P=0,95$; $Csx \leq 9,1\%$).

Research groups / Quantities		Reference group n=48	Control group n=48		ROT n=42		LSE n=51		ROT+LSE n=38		ROT with IOLI n=31	
			I	II	I	II	I	II	I	II	I	II
RSP (mmHg)	standing	128,3 ±10,5	85,9 ±5,2	92,3 ±5,5	86,2 ±7,1	106,4 ±9,4*	87,3 ±7,1	108,5 ±8,5*	87,4 ±5,8	112,6 ±9,7*	87,6 ±7,0	111,4 ±10,0*
	lying	128.3 ±9,9	47,9 ±3,7	52,6 ±4,4	46,4 ±3,2	68,3 ±5,5*	47,6 ±4,1	72,3 ±6,5*	45,9 ±3,4	73,4 ±6,4*	47,3 ±3,9	74,6 ±6,7*
POVP (mmHg)	standing	53,8 ±4,4	67,9 ±5,6	63,5 ±5,3	68,3 ±5,5	57,0 ±3,6*	67,7 ±4,1	59,3 ±3,6*	68,0 ±5,0	57,6 ±3,9*	67,6 ±4,6	56,4 ±4,2*
	lying	27,2 ±2,1	21,2 ±1,7	21,7 ±1,9	20,5 ±1,7	24,0 ±1,4*	19,4 ±1,3	23,3 ±1,5*	20,2 ±1,5	24,6 ±1,8*	21,0 ±1,6	25,6 ±1,6*
VAFI (%)	standing	41,9 ±3,1	79,0 ±6,4	68,7 ±5,2	79,2 ±6,4	53,6 ±4,4*	77,5 ±6,3	54,7 ±4,6*	77,8 ±6,1	51,2 ±4,5*	77,2 ±5,9	50,6 ±3,9*
	lying	21,2 ±1,7	44,3 ±3,4	41,3 ±4,1	44.2 ±3,2	35,1 ±2,9*	40,8 ±3,4	32,2 ±2,6*	44,0 ±3,7	33,5 ±2,9*	44,4 ±3,5	34,3 ±2,7*
RSPG		1	1,79 ±0,14	1,75 ±0,15	1,86 ±0,15	1,56 ±0,12*	1,83 ±0,14	1,50 ±0,12*	1,90 ±0,15	1,53 ±0,13*	1,85 ±0,16	1,53 ±0,13*
POVPG		1,98 ±0,17	3,20 ±0,27	2,92 ±0,22	3,33 ±0,25	2,38 ±0,18*	3,49 ±0,26	2,66 ±0,22*	3,36 ±0,26	2,34 ±0,20*	3,17 ±0,27	2,30 ±0,20*

Notes: *- ROT - revascularizing osteotrepanation; LSE - lumbar sympathectomy; ROT + LSE - - revascularizing osteotrepanation + lumbar sympathectomy; ROT with IOLI - revascularizing osteotrepanation with intraosseous laser irradiation; RSP - regional systolic pressure; POVP - post-occlusive venous pressure; VAFI – venous arterial flow index: RSPG - regional systolic pressure gradient; POVPG - postocclusal venous pressure gradient; I - upon admission to the clinic; II - at the end of inpatient treatment*

*- * - the difference between indicators I and II on the horizontal line is statistically significant ($p < 0.05$).*

and the standing POVP increases, while the POVPG increases from 1.98 ± to 3.33 ± 0.29. In patients with CLI VAFI increases both standing and lying. We agree with the opinions of other authors that an increase in POVPG, as an increase in resistance in the microvasculature, leads to opening of arteriovenous shunts with a further deterioration in tissue perfusion.

Increased VAFI indicates a decrease in the pressure gradient between the arterial and venous microcirculation, leading to a deterioration in microcirculation. Thus, in accordance with the classification of microcirculatory disorders (1, 2, 11, 13), we revealed a severe degree of microcirculation insufficiency with decompensated hemodynamic disorders and weakening of tissue blood flow.

Along with clinical improvement in general condition, with regression of critical ischemia signs, we observed positive dynamics in arterial and venous regional blood circulation in the control and in the main groups. However, at the end of inpatient treatment in the control group, in comparison with the initial data, we noted slightly unreliable positive dynamics.

In the group of patients undergoing indirect revascularization, by the end of inpatient treatment, a reliable alignment of the regional blood flow parameters was established. Thus, standing RSP increased by 23.4 - 28.8% (p <0.05), lying RSP - 47.5 -59.9% (p <0.05), lying POVP - by 17.1 - 21 9% (p <0.05). Standing POVP decreased by 12.5 - 16.6% (p <0.05), standing VAFI by 29.4 - 34.5% (p <0.05), lying VAFI - by 20.6 - 23.9 % (p <0.05). At the end of inpatient treatment, a decrease in RSPG was detected by 16.2 - 19.5% (p <0.05), POVPG - by 23.8 - 30.4% (p <0.05)

Indirect methods of revascularization in patients with CLI led to an increase in RSP standing and lying, in VAFI standing and lying, in RSPG, in POVPG and in POVP lying with a simultaneous decrease in POVP standing. A decrease in VAFI standing and lying indicates an increase in the pressure gradient between the arterial and venous parts of microcirculation, leading to an increase in tissue perfusion.

We performed a statistical analysis of dependence of the regional blood flow stimulation degree (VAFI standing and lying, RSPG, POVPG) on individual methods of indirect revascularization ($_{\chi}2$; p; r) (Table 3). It was revealed that VAFI standing and lying, RSPG, POVPG significantly (p <0.05 - 0.001) vary depending on the method of indirect revascularization; between the peripheral circulation stimulation degree and indirect revascularization methods, there is mainly a moderate correlation (r = 0.4-0.6). Despite a significant (p <0.05) change in these parameters, in the group of patients who underwent ROT, there is a weak correlation (r = 0.3).

Table 3.
The correlation of changes in the parameters of arterial and venous regional blood circulation with regional blood circulation stimulation methods (number of patients, χ^2;p;r)

Quantities \ Research groups		Control group n=48	ROT n=42		LSE n=51		ROT+LSE n=38		ROT with IOLI n=31	
VAFI standing	decreased	18	25	χ^2=4,355 p<0,05 r=0,3	32	χ^2=6,304 p<0,05 r=0,4	28	χ^2=11,162 p<0,001 r=0,5	26	χ^2=16,414 p<0,001 r=0,6
	without change	30	17		19		10		5	
VAFI lying	decreased	17	25	^{2}=5,230 p <0,05 r=0,3	34	χ^2=9.668 p <0,01 r=0,4	28	χ^2=12,451 p <0,001 r=0,5	25	χ^2=15,474 p <0,001 r=0,6
	without change	31	17		17		10		6	
RSPG	decreased	21	28	χ^2 =4,473 p <0,05 r = 0,3	33	χ^2 =4,380 p <0,05 r = 0,3	27	χ^2 =6,411 p <0,05 r = 0,4	27	χ^2 =14,844 p <0,001 r = 0,6
	without change	27	14		18		11		4	
POVPG	decreased	19	26	χ^2 =4,464 p <0,05 r = 0,3	31	χ^2 =4,446 p <0,05 r = 0,3	29	χ^2 =11,604 p <0,001 r = 0,5	26	χ^2 =15,070 p <0,001 r = 0,6
	without change	29	16		20		9		5	

Notes: *- ROT - revascularizing osteotrepanation; LSE - lumbar sympathectomy; ROT + LSE - - revascularizing osteotrepanation + lumbar sympathectomy; ROT with IOLI - revascularizing osteotrepanation with intraosseous laser irradiation; VAFI - venous arterial flow index; RSPG - regional systolic pressure gradient; POVPG - post-occlusive venous pressure gradient.*

Table 2.
Dynamics of RI, LBV and OSS in patients with CLI on the background of distal steno-occlusion as a result of blood circulation stimulation by indirect revascularization ($X \pm s_x$; P=0,95; $Csx \leq 9,1\%$)

Research groups / Quantities	Reference group n=48	Control group n=48		ROT n=42		LSE n=51		ROT+LSE n=38		ROT with IOLI n=31	
		I	II	I	II	I	II	I	II	I	II
RI (units)	0,62 ±0,04	0,29 ±0,02	0,30 ±0,02	0,28 ±0,02	0,42 ±0,03*	0,28 ±0,02	0,43 ±0,03*	0,29 ±0,02	0,46 ±0,03*	0,29 ±0,02	0,50 ±0,04*
LBV (cm/ sec)	63,9 ±5,6	37,6 ±3,1	41,3 ±4,0	36,9 ±2,1	47,4 ±3,9	38,2 ±2,9	50,6 ±4,5*	37,3 ±3,1	51,8 ±4,5*	36,8 ±2,8	52,3 ±4,9*
OSS (%)	96,4 ±8,4	52,3 ±4,7	55,2 ±5,0	51,9 ±4,7	62,1 ±4,7*	51,3 ±4,4	62,7 ±5,3*	50,2 ±3,9	63,8 ±5,3*	52,4 ±4,9	68,5 ±5,2*

Notes: *- ROT - revascularizing osteotrepanation; LSE - lumbar sympathectomy; ROT+ LSE - revascularizing osteotrepanation + lumbar sympathectomy; ROT with IOLI - revascularizing osteotrepanation with intraosseous laser irradiation; I- upon admission to the clinic; II- at the end of inpatient treatment*
** - the difference between the indicators I and II on the horizontal line is statistically significant (p <0.05)*

To assess the effect of indirect revascularization operations on regional hemodynamics, we also studied the parameters of RI, LBV and OSS (Table 2). As can be seen from the table, upon admission to the clinic in patients, the RI, LBV and OSS parameters, in comparison with the reference group, were characterized by a pronounced decrease in all examined groups. In patients with CLI, a decrease in total blood flow (a decrease in RI), a decrease in tissue perfusion (a decrease in OSS), and an increase in peripheral vascular resistance (a decrease in LBV) were revealed.

At the end of inpatient treatment in the control group, we noted a tendency towards an improvement in RI, LBV and OSS. In the main clinical groups, in comparison with the initial data, an increase in RI was recorded by 50.0 - 72.4% (p <0.05), LBV by 28.5 - 42.15 (p <0.05), and OSS by 19.6 - 30.7% (p <0.05). The indicated dynamics of the parameters allows us to judge the stimulation of total blood flow, a decrease in peripheral vascular resistance and an increase in the oxygen supply of tissues in the ischemic limb in patients with CLI after indirect revascularization. Comparing the dynamic changes in RI, LBV and OSS between clinical groups, we noted a more pronounced leveling of these parameters in the group of patients who underwent ROT with intraosseous laser irradiation.

We have analyzed the correlation between changes in RI, LBV, OSS and regional blood circulation stimulation methods. To this end, we studied the correlation coefficient (r) and the Pearson agreement criterion (x^2) at a confidence level of P = 0.95 (p <0.05). (Table 4) Statistical analysis showed that in the group of patients with mobilization peripheral blood flow was performed by operations of LSE, LSE + ROT and ROT with IOLI, these indicators are significantly (p <0.05-0.001) improved depending on regional blood circulation stimulation method and there is a moderate correlation between them (r = 0.4 - 0, 6). In the group of patients who underwent ROT surgery, depending on

Table 4.
The correlation of changes in the RI, LBV and OSS with regional blood circulation stimulation methods (number of patients, χ^2;p;r)

Quantities / Research groups		Control group n=48	ROT n=42		LSE n= 51		ROT+LSE n=38		ROT with IOLI n=31	
RI	increase	20	27	χ^2=4,593 p<0,05 r=0,3	36	χ^2=8,418 p<0,05 r=0,4	28	χ^2=8,816 p<0,01 r=0,4	27	χ^2=16,131 p<0,001 r=0,6
	without change	28	15		15		10		4	
LBV	increase	18	26	χ^2=5,339 p <0,05 r=0,3	32	χ^2=6.304 p <0,001 r=0,4	28	χ^2=11,162 p <0,001 r=0,5	26	χ^2=16,414 p <0,001 r=0,6
	without change	30	16		19		10		5	
OSS	increase	18	25	χ^2 =4,355 p <0,05 r = 0,3	33	χ^2 =7,328 p <0,01 r = 0,4	29	χ^2 =12,894 p <0,001 r = 0,5	26	χ^2 =16,414 p <0,001 r = 0,6
	without change	30	17		18		9		5	

Notes: *- ROT - revascularizing osteotrepanation; LSE - lumbar sympathectomy; ROT+ LSE - revascularizing osteotrepanation + lumbar sympathectomy; ROT with IOLI - revascularizing osteotrepanation with intraosseous laser irradiation; RI - reographic index; LBV - linear blood flow velocity; OSS - oxygen saturation of the skin*

the blood flow stimulation method with a weak correlation, these indicators are significantly improved. A statistical analysis was carried out between two (classical ROT and ROT with IOLI) clinical groups and it was found that when performing ROT with IOLI, peripheral circulation stimulation was significant ($p < 0.05$) with weak or moderate correlation ($r = 0.3$-0, 4) (table 4)

Despite the positive dynamics in the regional arterial and venous blood circulation, at the end of inpatient treatment, the quantities of these parameters statistically significant differed from the reference group. Nevertheless, judging by data, in comparison with the control group, patients undergoing indirect revascularization operations showed significant stimulation of regional blood circulation.

A comparative study of the RI, LBV and OSS dynamics showed that the best method of peripheral blood flow stimulation by indirect revascularization in patients with CLI on the background of distal arterial disorders is observed with revascularizing osteotrepanation with interosseous laser irradiation.

Findings

1. Stimulation of the regional blood flow of patients with CLI on the background of distal steno-occlusion of arteries is significantly ($p < 0.05$ - 0.001) dependent on indirect revascularization methods with weak ($r = 0.3$) or moderate ($r = 0.4$-0, 6) correlation.
2. If it is impossible to perform shunt operations, the stimulation of peripheral blood circulation by indirect methods of revascularization significantly improves the clinical results of treatment, which makes it possible to recommend such operations as a justified method of complex surgical treatment of patients with CLI as an alternative to amputation.

References

1. Abalmasov K.G.,Morozov K.M. Okkljuzirujushhie porazhenija arterij distal'nogo rusla.Problemy diagnostiki i lechenija. Chast' 2.//Annaly hirurgii.-1997.-№5.-s.21-25
2. Anisimov A.V. Optimizacija diagnostiki i lechenija bol'nyh s hronicheskimi obliterirujushhimi zabolevanijamit arterij nizhnih konechnostej(kliniko-jeksperimental'noe issledovanie).// Avtoref.diss. ... kand.med.nauk.-Ufa, 2011.- 23 s.
3. Bokerija L.A., Temrezov M.B.,Kovalenko V.I. i dr.Aktual'nye problemy hirurgicheskogo lechenija bol'nyh s kriticheskoj ishemiej nizhnih konechnostej – puti reshenija.(sostojanie problemy)// Annaly hirurgii.-2011.- № 1.- 5-9.
4. Burov A.Ju.,Artem'eva K.A.,Azar'jan A.S. i soat. Differencirovannyj podhod v lechenii bol'nyh s kriticheskoj ishemiej nizhnih konechnostej pri ateroskleroticheskom porazhenii arterij bedrenno-bercovogo segmenta.// Angiologija i sosdistaja hirurgija. (prilozhenie).-2019.-T.25.- 2.- s.81-82.
5. Gavrilenko A.V. Hirurgicheskoe lechenie bol'nyh s kriticheskoj ishemiej nizhnih konechnostej, obuslovlennoj porazhenijami arterij infraingvinal'noj lokalizacii// Angiologi i sosudistaja hirurgija.-2008.-T.14.-№ 3.-s 111-117.
6. Zusmanovich F.N. Revaskuljarizirujushhajaosteotrepanacija v lechenii hronicheskoj kriticheskoj ishemii nizhnih konechnostej.// Hirurgija.-1999.-№ 4.s.10-12.
7. Kazakov Ju.I.,Zhuk D.V. Sravnitel'nye rezul'taty otkrytyh i jendovaskuljarnyh vmeshatel'stv u bol'nyh s okkljuziej bedrenno-podkolennogo arterial'nogo segmenta v stadii kriticheskoj ishemii nizhnih konechnostej.// Angiologija i sosudistaja hirurgija. (prilozhenie).-2019.-T.25.- 2.- s.181-182.
8. Korabel'nikovJu.A.Differencirovannoe primenenie metodik neprjamoj revaskuljarizacii v lechenii bol'nyh s hronicheskoj ishemiej nizhnih konechnostej// Avtoref.diss....kand.med.nauk,Kazan',2012.- 23 s.
9. Kosaev Dzh.V. Vnutrikostnomozgovoe lazernoe obluchenie v kompleksnom hirurgicheskom lechenii bol'nyh s kriticheskoj ishemiej nizhnih konechnostej// Central'no-Aziatskij medicinskij zhurnal,2011.-Tom 17,№ 3-4. -213-216.
10. Nacional'nye rekomendacii po diagnostike i lecheniju zabolevanij arterij nizhnih konechnostej// Angiologija i sosudistaja hirurgija(Prilozhenie № 2).-2019.-T.25.-№ 2.-110 s.
11. Suhovatyh B.S.,Orlova A.Ju. Lechenie kriticheskoj ishemii nizhnih konechnostej sposobami neprjamoj revaskuljarizacii.(monografija) .Kurs.:izd.KGMU, 2013.-208 s.
12. HovalkinV.G.,TarabrinA.S.,Zheltov N.Ju. i soavt. Otdalennye rezul'taty jendovaskuljarnyh vmeshatel'stv u pacientov s okkljuziej podkolennoj arterii, stradajushhih kriticheskoj ishemiej nizhnih konechnostej.// Angiologija i sosdistaja hirurgija.(prilozhenie).-2019.-T.25.- 2.- s.468-469.
13. Hudashov V.G. Ocenka regionarnogo krovotoka pri hirurgicheskom lechenii bol'nyh s zabolevanijami magistral'nyh sosudov nizhnih konechnostej// Avtoref. diss. ... kand.med. nauk, Novosibirsk,2004.-24 s.
14. Junkerov V.I., Grigor'ev S.G., Rezvancev M.V. Matematiko-statisticheskaja obrabotka dannyh medicinskih issledovanij. Sankt-Peterburg, VmedA, 2011, 318 s.
15. AbushovN.S.,ZakirjayevE.J.,KerimovM.M. etal.Effect of lumbar sympathectomy and postoperative prolonged epidural analgesia in patients with thrombangiitis obliterans and critical limb ischemia.20th European chapter Congress of the International Union of angiology.2011; October 6-8: 100-101.
16. Bosch J.L.,Hunink M.G. Meta-analysis of the results of percutaneous transluminal angioplasty and stent placement for aortoiliac occlusive disease.// Radiology.-2007; 204(1).-p.87-96
17. Clair D.G.,Dayal R.,Faries P.L. et al.Tibial angioplasty as an alternative strategy in patients with limb-threatening ischemia.// Ann.Vasc.Surg. 2005; 19(1).-p.63-68.

УДК 616.717.9:617-089.844

TREATMENT OF DISTAL FINGER INJURIES LEADING TO “MALLET FINGER”

ABOUT THE AUTHORS

Muradov Misil Islamovich *- Head of the Department of Reconstructive-Plastic Microsurgery.*

Muhammedkerim Kanat Basarbekovich *- a microsurgeon of the department of reconstructive-plastic microsurgery.*

Baiguzeva Aliya Askarbekovna *- a microsurgeon of the department of reconstructive-plastic microsurgery. St. Zheltokkan 62, Almaty, 05004, Kazakhstan e-mail: mismil@yandex.kz*

Muradov M.I.[1], Muhamedkerim K.B.[1], Baiguzeva A.A.[1], Koshkarbayev D.Zh.[1], Kazantayev K.E.[2], Kalan B.K.[1]

[1]National Scientific Center of Surgery named after A.N. Syzganov
[2]National Olympic Committee of the Republic of Kazakhstan, Almaty, Kazakhstan

Abstract

Today, damage to the hand and fingers is the predominant number of injuries of the musculoskeletal system, which is due to the acceleration of the pace of life. Damage of the type “mallet finger” (“hammer finger”) is often 1.5-3% among all injuries of the brush.

The urgency of this problem is due not only to the increase in the frequency of injuries among the working-age population, but also to the severity of their consequences for the person and society.

Keywords
trauma, hand, extender tendons, hammer deformation, treatment

Қол саусақтарының дисталды бөлігінің «MALLET FINGER» жарақатына алып келетін патологиясын емдеу шарасы

АВТОРЛАР ТУРАЛЫ

Muradov Misil Islamovich *- Head of the Department of Reconstructive-Plastic Microsurgery.*

Muhammedkerim Kanat Basarbekovich *- a microsurgeon of the department of reconstructive-plastic microsurgery.*

Baiguzeva Aliya Askarbekovna *- a microsurgeon of the department of reconstructive-plastic microsurgery. St. Zheltokkan 62, Almaty, 05004, Kazakhstan e-mail: mismil@yandex.kz*

Мурадов М.И.[1], Мухамедкерим Қ.Б.[1], Байгузева А.А.[1], Қошкарбаев Д.Ж.[1], Қазантаев Қ.Е.[2], Қалан Б.Қ.[1]

[1]А.Н. Сызганов атындағы Ұлттық ғылыми хирургия орталығы,
[2]Қазахстан Республикасының Ұлттық Олимпиада комитеті, Алматы, Қазақстан

Аңдатпа

Бүгінгі күні қолдың және саусақтардың зақымдануы тірек-қимыл аппаратының зақымдануы ішіндегі басым бөлігі болып табылады, бұл өмір сүру қарқынының жоғарлауына байланысты. «MALLET FINGER» түрінің зақымдануы («балға тәріздес деформация») қолдың барлық жарақаттарының арасында көбінесе 1,5-3% -те кездеседі. Бұл проблеманың өзектілігі еңбекке қабілетті тұрғындар арасында жарақат алу жиілігінің артуымен ғана емес, сонымен қатар олардың адамдар мен қоғам үшін салдарының өзектілігімен де байланысты.

Түйін сөздер
жарақат, қол, жазғыш сіңір, балға тәріздес деформация, емдеу шарасы

Лечение повреждений дистальных отделов пальцев кисти, приводящих к «MALLET FINGER»

ОБ АВТОРАХ

Muradov Misil Islamovich *- Head of the Department of Reconstructive-Plastic Microsurgery.*

Muhammedkerim Kanat Basarbekovich *- a microsurgeon of the department of reconstructive-plastic microsurgery.*

Baiguzeva Aliya Askarbekovna *- a microsurgeon of the department of reconstructive-plastic microsurgery. St. Zheltokkan 62, Almaty, 05004, Kazakhstan e-mail: mismil@yandex.kz*

Мурадов М.И.[1], Мухамедкерим К.Б.[1], Байгузева А.А.[1], Кошкарбаев Д.Ж.[1], Казантаев К.Е.[2], Калан Б.К.[1]

[1]Национальный научный центр хирургии им. А.Н. Сызганова,
[2]Национальный Олимпийский комитет Республики Казахстан, Алматы, Казахстан

Аннотация

На сегодняшний день, повреждения кисти и пальцев составляет преобладающее количество среди травм опорно-двигательного аппарата, что обусловлено ускорением темпа жизни. Повреждение типа «mallet finger» («молоткообразный палец») встречается нередко 1,5-3 % среди всех травм кисти. Актуальность этой проблемы обусловлена не только ростом частоты повреждений среди трудоспособного населения, но и тяжестью их последствий для человека и общества.

Ключевые слова
травма, кисть, сухожилия разгибателей, молоткообразная деформация, лечение

Introduction

Damage to the tendons of the finger extenders of the "mallet finger" ("hammer finger") is often 1.5-3% among all injuries to the upper limb. [1,2,3]

These, small, at first glance, percentages indicate a huge number of patients, as the brush is the most frequently injured part of the human body, accounting for 30.8% of all musculoskeletal injuries, which suggests that this damage is one of the frequent injuries. [4,5,6]

When treating various variants of this injury, there are still no generally accepted recommendations.

In particular, for the treatment of closed fresh and long-lasting injuries such as "mallet finger," there are completely polar recommendations from "rest" to amputation of the terminal phalanx. Between these extreme points of view are recommendations for the use of various tyres, gypsum bandages, external fixation devices, method of transarticular fixation with a spoke, tendon suture, tendoplasty, arthrodesis. [7,8,9,10]

Purpose

Optimization of the approach to the treatment of injuries of the distal finger, leading to "hammer deformation," taking into account the damage variants and anatomical features of the area.

Materials and methods

In the period from 2016 to 2020, 156 patients with subcutaneous damage to extender tendons were operated on the basis of the A.N Syzganov National Scientific Center of Surgery in the Department of Reconstructive-Plastic and Aesthetic Microsurgery.

The patients were divided into 2 groups. The first group included patients with closed damage to the tendons of long finger extenders who applied for urgent care. The group consisted of 64 people (42 men and 22 women aged 17 to 36). All patients of group 1 were subjected to conservative therapy, in the form of temporary immobilization of the finger in the position of hyperextension for 1.5 months. Longets made from "Safi x plus" gypsum bandage and Hartmann 's "Rhena term" thermoplastic synthetic bandage were used. (Figure 1.2) After 6 weeks, the development of movements in DIP joint was started, and no special exercises were required. The positive result of conservative treatment was the restoration of the volume of active movements with a deficit of not more than 18 degrees. In other cases, the patient was shown operative treatment.

The second group was made up of patients in need of operative treatment of damage to the tendons of long finger extenders at DIP joint level. It included 92 people (51 men and 41 women between the ages of 17 and 63).

The distribution of patients by type of injury by J.R.Doyle classification is shown in Table 1.

Patients with I and IV types of damage (62 people) applied 2-3 months after the injury. 15 people (24.2%) were not treated for various reasons. 44 patients (71.0%) under trauma centre conditions were applied gypsum longet, but conservative therapy did not lead to a positive effect. Three patients (4.8%) applied more than six months after the injury. 16 patients (76.2%) of type II injuries were received as a matter of urgency, the remaining 5 people (23.8%) - 2-3 months after complete wound healing. All patients with type III damage, arrived as a matter of urgency.

The second group was made up of patients in need of operative treatment of damage to the tendons of long finger extenders at DIP joint level. It included 92 people (51 men and 41 women between the ages of 17 and 63).

Figure 1
Typical mechanism of "mallet finger"

Figure 2
Immobilization option for "mallet finger"

Type of damage	Nature of damage	Number of patients	
		Abs.	%
I	Closed tendon damage - separation from distal phalanx	49	53,3
II	Open tendon damage at DIP joint	21	22,8
III	Open tendon damage with skin defect	9	9,8
IV	Fracture of distal phalanx at tendon attachment site	13	14,1
TOTAL		**92**	**100,0**

Table 1
Patient distribution by type of injury

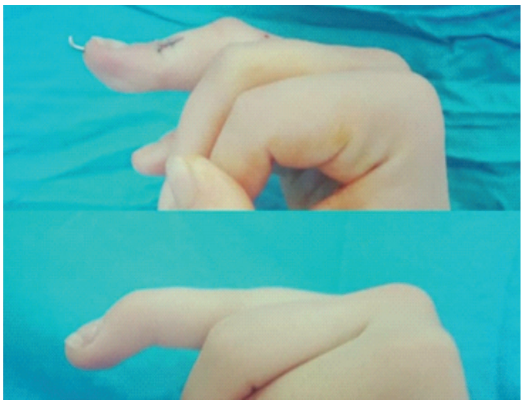


Figure 3
Operative treatment of long finger extension tendon injuries at DIP joint level

Under conductor anesthesia by Oberst - Lukashevich under aseptic conditions with solution Novocaine 0.25% - 20.0 ml. After appropriate treatment of the upper limb. At the level of distal interphalangeal joint, Z-shaped incision of skin subject to tissues is made along rear surface of finger. During the inspection, the complete anatomical break of the extender tendon is revealed. Under the magnification of 2.5x thread Prolen 3/0 is made plastic tendon extender. MOS of nail phalanx in position of extension by Kirchner 's spoke. (Figure 3) Hemostasis during the operation. Sutures on the wound with Prolen thread 3/0. Expert. Bandage.

Results and discussion

According to the data available in the literature, in case of closed injuries of tendons of extenders of long fingers at the level of distal interphalangeal joint, it is advisable to carry out conservative therapy within 14 days after injury. According to our data, when the patient turns up to 24 hours, the effectiveness of conservative therapy is only 52%. As the time interval from the moment of injury to the beginning of treatment increases, the effectiveness of conservative therapy decreases dramatically. Absence of relapses and complications in the form of ligature fistulas after performance of tenodermodesis indicates high efficiency and safety of this method. Besides, tenodermodesis is technically simple, does not require special tools and can be performed in outpatient conditions.

Conclusions

1. It is advisable to carry out conservative therapy of closed injuries of long finger once-flutter tendons at DMFS level during the first day after injury.
2. In case of open and closed injuries of tendons of long finger extenders at the level of distal interphalangeal joint (type I and II according to Doyle) it is recommended to perform tenodermodesis in combination with arthrodesis of distal interphalangeal joint in position of hyperextension.
3. In type III injuries, an effective treatment method is autodermoplasty with a full layer skin flap in combination with DMFS arthrodesis in the hyperextension position.
4. In case of type IV injuries, it is recommended to fix the bone fragment of the phalanx and arthrodesis of the distal interphalangeal joint in the position of hyperextension with Kirschner 's spokes.

References

1. Korshunov V. F. Treatment of closed injuries tendon apponeurotic finger stretching at the level of distal interphalangeal joint / V.F. Korshunov, A.D. Moscow, D.A. Magdiyev//Orthopaedia, traumatology and prosthetics. - 2015. - № 8. - P. 12-14
2. Zolotov A.S., Zelenin V.N., Sorokovikov V.A. Treatment of injuries of distal fingers of the hand leading to hammer-shaped deformation. - Irkutsk: NC RVKh CO RAMN, 2016. - P. 150-153
3. Upton J. Primary care of the injured hand, part 1 / J. Upton, J.W. Littler, R.G. Eaton // Postgraduate Medicine. – 1979. – Vol. 66, N 2. – P. 115–120.
4. The most frequent tendon injury: the «mallet finger». Review, therapeutic concept and results / S. Winckler, H. Rieger, J. Grunert et al. // Zentralbl Chir. – 1991. – Vol. 116, N 22. – P. 1273–1289.
5. Stack H.G. A modified splint for mallet finger / H.G. Stack // J. Hand Surgery. – 1986. – Vol. 11B. – P. 263.
6. Ashkenazi A.I., Abdulhabirov M.A. Subcutaneous breaks of long thumb extensor (diagnosis, treatment, prevention)//Prevention, diagnosis and treatment of spinal and limb injuries and diseases: st. тр. CITO. - Moscow, 1984. - P 59-63
7. Magdiyev D.A., Chulovskaya I.G., Lipinsky P.V., etc. Treatment of tendon injuries of finger extenders// Sat.: Modern technologies for diagnosis, treatment and rehabilitation of injuries and diseases of the hand. - Moscow, November 9-10, 2005. - P.148-151.
8. Damron T.A., Lange R.H., Eneber W.D. Mallet fi ngers: a review and treatment algorithm. Int J Orthop Trauma 1991; 1(2): 105-110.
9. Wolfe S.W., Hotchkiss R.N., Pederson W.C., Kozin S.H. Green's operative hand surgery, 6th ed., 2-Vol set. Elsevier Churchill Livingstone 2010.
10. Kardestuncer T., Bae D.S., Waters PMJ Pediatr Orthop. The results of tenodermodesis for severe chronic mallet fingerdeformity in children 2008; 28(1): 81-85

THE TREATMENT OF ANASTOMOTIC STRICTURES AFTER LIVE-DONOR LIVER TRANSPLANTATION

УДК 616.361-089:617-089.844

Abdirashev Y.B.[1], Abdiyev N.M.[1], Doskhanov M.O.[1], Skakbayev A.S.[1], Basymbekov A.M.[2]

[1]JSC "National Scientific center of surgery named after A.N. Syzganov" Almaty, Kazakhstan.
[2]The emergency hospital of Almaty, Kazakhstan

ABOUT THE AUTHORS

Nurken Abdiyev *– surgeon-endoscopist Endoscopy and functional diagnostic department; abdievnm@gmail.com*

Yerlan Abdirashev *– Head of Endoscopy and functional diagnostic department; erlan_abdirashev@mail.ru*

Maksat Doskhanov *– Head of hepatopancreatobiliary surgery and liver transplantation; max8616@mail.ru*

Aidar Skakbayev
Surgeon of hepatopancreatobiliary surgery and liver transplantation; dr.skakbayev@gmail.com

Akhan Basymbekov *– Surgeon Emergency surgery department; ahan.mustafaevich@mail.ru*

Abstract

Liver transplantation is the only treatment for the decompensated level of cirrhosis. Due to improvement of the surgery methodology and management of patients, the survival rate of patients up to 1 year is 90%, and 5-year to 80%. However, post-transplantation complications remain the main cause of recipient morbidity and mortality. The basic reasons for the development of strictures of the bile duct after transplantation depends on: 1. The type of transplant. 2. The number and type of bile ducts carried out for the application of anastomoses, in particular liver transplantation from a living donor. 3. Type of anastomosis (biliary-biliary or choledochojejunoanastomosis). Most complications after surgery are diagnosed after live-donor liver transplantation. Since the transplant is one of the lobes with ducts of smaller diameter. Given the above, the complications of the biliary duct system after transplantation from a cadaveric donor is 5-15%, and after live-donor it reaches up to 38%. Including, when taking the right lobe of the liver in living donors, the percentage of complications varies from 24% to 60%.

Keywords
Key words: ERCP, liver transplantation, biliary complications, biliary anastomotic stricture, bilio-biliary anastomosis, live-donor liver transplantation, endobiliary stenting, jaundice

Тірі донор бауыр трансплантациядан кейінгі анастомоздық стриктуралардың емі

Әбдірашев Е.Б.[1], Абдиев Н.М.[1], Досханов М.О.[1], Скакбаев А.С.[1], Басымбеков А.М.[2]

[1]«А.Н. Сызғанов атындағы Ұлттық Ғылыми хирургия орталығы» АҚ, Алматы, Қазақстан.
[2]Алматы қаласының Жедел шұғыл көмек көрсету ауруханасы, Қазақстан

АВТОРЛАР ТУРАЛЫ

Абдиев Нуркен Махамашұлы *– хирург-эндоскопист; Эндоскопия и функциональді диагностика бөлімі; abdievnm@gmail.com*

Әбдірашев Ерлан Байтөреұлы *– Эндоскопия және функциональді диагностика бөлімінің меңгерушісі; erlan_abdirashev@mail.ru*

Досханов Мақсат Оналбайұлы *– Гепатопанкреатобилиарлы хирургия және бауыр трансплантация бөлімінің меңгерушісі; max8616@mail.ru*

Сқақбаев Айдар Серикұлы *– Хирург; Гепатопанкреатобилиарлы хирургия және бауыр трансплантация бөлімі; dr.skakbayev@gmail.com*

Басымбеков Ахан Мустафұлы *– Хирург; Шұғыл хирургия қабылдау бөлімі; ahan.mustafaevich@mail.ru*

Аңдатпа

Бауыр трансплантациясы – бауыр циррозының ауыр сатысындағы жалғыз емдеу тәсілі болып табылады. Науқастар менеджменті мен ота методиканысының жетілдіруідің арқасында науқастардың өмір сүруі 1 жылға дейін 90 %-ды, ал 5 жылға дейінгі өміршеңдігі 80 %-ды құрайды. Алайда трансплантациядан кейінгі асқынулар, реципиенттердің ауруына және өліміне негізгі себебі ретінде қалып отыр. Трансплантациядан кейінгі өт жолдары стриктурасы дамуының негізгі себептері мынадай көрсеткіштерге байланысты: 1. Трансплантаттың түрі. 2.Анастомоздарды салу үшін жүргізілетін өт жолдарының түрі мен санына, оның ішінде тірі донордан бауыр трансплантациясы. 3. Анастомоздың түрі (билио-биллиарлы немесе гепитикоеюноанастомоз). Операциядан кейінгі асқынулар көбінесе тірі донор трансплантациядан кейін жасалған науқастарда кездеседі. Өйткені тірі-донордан алынған бауыр трансплантатында өт жолдарының калибрі кіші. Жоғарыда айтылғандарды ескерсек, мәйіттік донордан алынған бауыр трансплантациясынан кейінгі өт жолы жүйесінің асқынуы 5-15%-ды құраса, ал тірі донордан 38%-ға дейін жетеді. Соның ішінде тірі донорлардан бауырының оң бөлігін алған кездегі асқынулар 24%-дан 60%-ға дейін түрленеді.

Түйін сөздер
механикалық сарғаю, өт қабы жолының төмен қосылуы, холедохолитиаз

Лечение анастомотических стриктур после трансплантации печени от живого донора

ОБ АВТОРАХ

Абдиев Нуркен Махамашович –
хирург-эндоскопист; Отделение эндоскопии и функциональной диагностики; abdievnm@gmail.com

Әбдірашев Ерлан Байтуреевич –
Заведующий отделением эндоскопии и функциональной диагностики; erlan_abdirashev@mail.ru

Досханов Максат Оналбаевич –
Заведующий отделением гепатопанкреатобилиарной хирургии и трансплантации печени; max8616@mail.ru

Скакбаев Айдар Серикович–
Хирург отделения гепатопанкреатобилиарной хирургии и трансплантации печени; dr.skakbayev@gmail.com

Басымбеков Ахан Мустафаевич –
Хирург; Отделение приемного покоя ahan.mustafaevich@mail.ru

Ключевые слова
ЭРХПГ, трансплантация печени, биллиарные осложнения, биллиарная анастомотическая стриктура, билио-биллиарный анастомоз, ТПЖД, эндобиллиарное протезирование, механическая желтуха

Әбдірашев Е.Б.[1], Абдиев Н.М.[1], Досханов М.О.[1], Скакбаев А.С.[1], Басымбеков А.М.[2]
[1]АО «Национальный научный центр хирургии имени А.Н. Сызганова» Алматы, Казахстан
[2]ГП «Больница скорой медицинской помощи» Алматы, Казахстан

Аннотация

Трансплантация печени является единственным методом лечения при декомпенсированной стадии цирроза печени. Благодаря совершенствованию оперативной методики и менеджмента больных, выживаемость больных до 1 года составляет 90 %, а 5-летняя до 80 %. Однако, посттрансплантационные осложнения остаются основной причиной заболеваемости и смертности реципиентов. Основные причины развития стриктур желчных протоков после трансплантации зависит от: 1. Вида трансплантанта. 2. Количества и вида желчных протоков, проводимых для наложения анастомозов, в частности трансплантация печени от живого донора. 3. Вида анастомоза (билио-биллиарный либо холедохоеюноанастомоз). Большинство осложнений после операции встречается у пациентов, перенесших трансплантацию от живого донора. Так как трансплантантом является одна из долей с протоками меньшего диаметра. Учитывая выше изложенное, осложнения протоковой системы после трансплантации печени от трупного донора составляет 5-15%, а при ТПЖД достигает до 38%. В том числе, при заборе правой доли печени у живых доноров процент осложнений варьирует от 24% до 60%.

Introduction

Nowadays, liver transplantation (TP) is the only treatment for the decompensated stage of liver cirrhosis (LC). Due to the improvement of the surgical methodology and management of patients, the survival rate of patients up to 1 year is 90%, and 5-year-old to 80% [1]. However, biliary complications (BC) associated with LT remain the main cause of morbidity and mortality in recipients. The main reasons for the development of strictures of the bile duct after LT depends on 1. The type of transplant. 2. The number and type of bile ducts performed to apply anastomoses, in particular liver transplantation from a living donor (LDLT). 3. Type of anastomosis (biliary-biliary or hepaticojejunoanastomy. Most complications after LT occur in patients undergoing LDLT. Since a living donor, as a rule, one of the lobes with ducts of a smaller diameter is taken. Given the above, the complications of the ductal system after liver transplantation from a cadaveric donor (DDLT) is 5-15%, and with LDLT it reaches 38% [2,3]. In particular, when taking the right lobe of the liver in living donors, the percentage of complications varies from 24% to 60% [4.24].

Today, with LDLT, a bilio-biliary anastomosis is preferable, since the technical, one is easier and the possibility remains for subsequent retrograde interventions.

Among all BC complications after LDLT, anastomotic strictures (AS) are leading, and the period of their occurrence is observed within a year from the moment of operation. AS develops 3 mm distal and / or proximal to the anastomosis. The main reason is associated with the technical aspects of the allocation of bile ducts from the donor and recipient, as well as biliary reconstruction of the bile ducts. AS occurs more often than non-anastomotic stricture as it is caused by the imposition of anastomosis of the ducts with a small diameter in comparison with DDLT [5,6]. Diagnosis of BC is based on changes in the biochemical aspects of liver tests, data from ultrasound (ultrasound) and magnetic resonance imaging (MRI) in cholangiography mode [7,8].

Long-time of intraductal biliary hypertension, the risk of developing cholangitis is extremely high. In this connection, the deterioration of the patient's condition and death can occur in a short time. It is worth noting that the long course of AS after LDLT affects the quality of life and can lead to transplant necrosis and death of the recipient [9,10].

There are several methods for eliminating BC after LT: endoscopic retrograde, transdermal antegrade, surgical and combined.

Endoscopic retrograde cholangiopancreatography (ERCP) technique, having gentle and minimally invasive features, is undertaken as the first stage of treatment [11,12,13]. In case of unsuccessful attempts of the retrograde method, patients undergo percutaneous transhepatic drainage (PTBD), surgical or combined methods.

PTBD is also a minimally invasive method of treatment; however, it requires the necessary con-

Characteristics of recipients with BC	Quantity	%
male\female	**14/12**	**52/48**
Type of biliary anatomy:		
A (61 patients)	15	58
B (6 patients)	4	15
C (9 patients)	7	27
Indication:		
Hepatitis B,C	23	88
HCC	1	3,8
Others	2	7,6
Type of biliary reconstruction:		
Bilio-bilioanastomosis	21	80,7
Bi-bilio-bilioanastomosis	3	11,6
Bilio-bilio +hepaticojejunoanastomy	2	7,7
anastomotic stricture	20	76
biloma	6	24
Early (before 6 months)	15	56
Late (after 6 months)	11	44

Table 1
Characteristics of recipients with biliary complications.

ditions for conducting. The main criteria is the presence of dilated intrahepatic bile ducts. If they are absent, it is impossible to perform it.

Surgical treatment of AS consists in dissociation of the bilio-bilio anastomosis and the perform cholangiojejunoanastomy. Success reaches up to 75% [7]. However, patients who underwent resurgery against the background of the initial heavy condition have a very high risk of an adverse outcome.

Combined techniques include the Rendezvous technique, which includes a combination of endoscopic retrograde and percutaneous drainage [23,24]. By PTBD, the conductor string is passed through the AS into the duodenum, thus providing retrograde access to the bile duct. In a similar way, a magnetic compression anastomosis (MAC) is used. It is performed by installing magnets percutaneously antegrade access to proximal and endoscopically retrograde distal to part of stricture. After installation, under the force of attraction of the magnets, a pressure fistula is formed between them. MAS is removed, and a stent is installed in the zone of the formed channel [14,24].

ERCP is highly effective, the possibility of repeated treatment sessions and a low percentage of complications [8]. A feature of the endoscopic technique is transpapillary cannulation, cholangiography, preliminary dilatation of the stricture and installing PS or self-expandable metal stent (SEMS). Balloon dilatation (BD) in combination with biliary stenting is much more effective, in comparison with only one BD. The success of stricture dilatation without stenting is 40%. The installation of only one PS gives a positive result in up to 75% of cases [15,16]. In this case, the AS of two or more PS provides a faster resolution of the stricture. Clinical efficacy ranges from 67% to 100%, and the risk of stricture recurrence is up to 9% [15, 16, 17, 18, 22, 24].

Materials and methods

This article includes the data of 76 recipients who underwent LDLT from December 2015 to December 2018.

70 (94.6%) patients transplantated the right lobe, the left lobe - 5 (4%) patients and the posterior lateral sector in 1 (1.4%) cases. Among 76 recipients, 26 (35%) patients developed various types of BS. Of 26 patients, anastomotic strictures (AS) occurred in 20 (77%) patients. In the remaining 6 (23%) patients, AS appeared due to partial failure of the biliary-biliary anastomosis with the formation of biloma.

Endoscopic retrograde technique was used as the first stage of BC correction in this category of patients. For the prophylactic purpose of post-ERCP pancreatitis (PEP), an non-steroidal anti-inflammatory drug 100 mg rectally was prescribed an hour before the intervention [19]. ERCP was performed under endotracheal anesthesia. For catheterization of the bile duct and the risk of reducing post-catheterization pancreatitis, a guide wire of 0.035 or 0.025 inches was used. With the introduction of X-ray contrast, the level, extent of stricture and / or the presence of leakage were determined. After interpretation of cholangiography, a dissection (papillosphincterotomy) of the orifice of the large duodenal papilla was performed for the subsequent outflow of bile, pancreatic juice and to easy implantation of the several PS [16]. Depending on the type of length and diameter of the stricture, a prelimi-

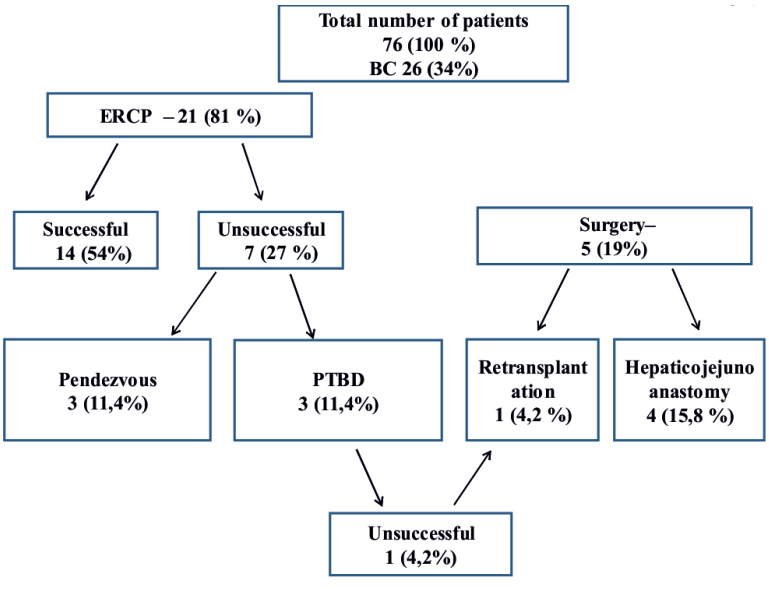


Fig. 2
Types of resolving biliary strictures

nary balloon dilatation of the stricture with an exposure of 30 to 60 seconds was used. At the same time, dilatation was carried out under the control of fluoroscopy until the stenosis was completely straightened. Subsequently, the PS was installed of the required size and length. PS are separated by diameter (5.0, 7.0, 8.5 or 10 service jackets (Fr.)) and type (straight, curved, like a "pig tail"). During the first ERCP session, stenting was performed by one PS, and with the technical possibility, up to two or more stents were installed. In that category patients, we did not use SEMS.

In the early post-ERCP period, patient monitoring was based on the levels of amylase, bilirubin, alanine aminotransferase, aspartate aminotransferase, general blood count and ultrasound of the liver-transplant's duct system.

In the late period, while maintaining positive dynamics, the patient underwent only reimplantation of the previously established PS. Subsequent repeated planned interventions were performed at intervals of 2 to 3 months. Each repeated session included replacement of the PS with a larger diameter and / or additional installation of the PS to expand the stricture to the diameter of the common bile duct. Replacement of PS was required to prevent obstruction of the biliary prosthesis and the development of cholangitis [20,21].

Results

The BO were eliminated by endoscopic retrograde, percutaneous antegrade, and through open surgery. Also, in some cases, a combined method of treatment was used, including antegrade and retrograde methods.

The total number of patients with BO, endoscopic correction was performed in 21 (80%) patients. Among which, only 14 (53%) recipients had technical success. In 7 (26.5%) patients, various types of stricture expansion were preliminarily performed followed by PS implantation. In 7 (27%) cases, the stricture was removed by stenting in the AC 10 Fr. without dilatation of stenosis. With severe stenosis, the first stage was a plastic stent 7.0 or 8.5 Fr. The stent was later replaced by 10 Fr. Subsequently, after 3-4 months, additional PSs were implanted. 8 (48%) patients underwent more than 3 ERCP sessions with the installation of up to 3 plastic stents. A total of 62 retrograde interventions were performed in 21 patients.

In 7 (27%) cases, it was not possible to eliminate BS using the retrograde method. 3 (11.5%) patients were eliminated by PTBD.

For 2 (7,7%) patients successful retrograde catheterization were achieved by using the Rendezvous method. In addition, 1 (3.8%) patient underwent the installation of a magnetic compression anastomosis (MCA) by antegrade and retrograde ways. In the early period after implantation of the MCA, the length of the stricture decreased. However, on the 6-7th day, the dislocation of the MCA happened. Subsequently, by reducing the length of the stricture, the elimination of the stricture was successfully resolved ERCP with the installation of PS.

The remaining 5 (19%) patients with AS were promptly resolved by relaporotomy with hepaticojejunastomy. 1 (3.8%) patient required liver retransplantation.

The initial success of retrograde correction was in 14 (54%) recipients. The combined technique has been shown to be effective in 3 (11.5%) patients.

In the early period, 8 (31%) patients developed PEP with an increase in amylase from 700 to 3000. At the same time, 4 (15%) patients with severe and prolonged stricture, a transient increase in amy-

Table 2.
Description in text

Treatment	Quantity	Complications	Lethal
ERCP:			
BD+PS	7	Cholangitis – 3	Liver failure – 1
PS	7	Biloma – 1	
		PEP – 8	
Randezvous:			
Cannulation	2		
MCA	1		
PTBD:	3	Cholangitis – 1	Liver failure – 1
Surgery:			
Hepaticojejunoanastomy	4	Cholangitis – 1	Transplant necrosis – 1
Retransplantation	1		Not related – 1

lase, we associate with primary stricture dilatation and implantation PS. By the way that the symptoms of PEP in all patients were safely stopped conservatively.

In the case of unsuccessful of ERCP cases, the PTBD was used in 4 (16%) patients. Also, in 4 (16%) cases initially the resolution of BC were done by relaporotomy with cholangiojuojenoanastomosis on the Ru loop and 1 (4%) patient required retransplantation.

The combined method was used after unsuccessful ERCP. In 2 cases, the Rendezvous method was carried out, and in 1 case, the MCA installation. In the latter case, it was not possible to completely resolve the stricture. However, due to the reduction in the length of the stenosis, implantation of a PS has become technically possible.

The 4 (15%) recipients in the group with post-transplant complications were died. In 2 cases, interventional procedures were unsuccessful, thereby severe multiorganic failure developed.

In 5 patients after surgical treatment of BC, 1 patient had transplant necrosis and 1 patient in the early postoperative period the severe cardiovascular failure occurred.

All 26 patients with BC were with bile ducts of anatomical type B and C. So, for example, with type A out of 61 patients BC developed in 15 (58%), type B out of 6 in 4 (67 %) and with type C out of 9 in 7 (78%) patients.

Discussion

The success of endoscopic correction of BC depends directly on the timely start of therapeutic measures. It is more difficult to obtain a favorable outcome if patients are treated at the top of clinical manifestations. Endoscopic treatment of AS that occurred during the first 6 months from the time of transplantation has a more favorable outcome, is technically easier and requires less repeated interventions [22, 24]. Correction, started later than 6 months, is less effective, more laborious and requires more ERCP procedures.

A favorable treatment outcome depends on several factors. Firstly, early diagnosis and timely treatment of BC. Secondly, the presence of a wide range of necessary tools. Thirdly, a specialist with high qualifications and sufficient competence for retrograde interventions.

In this regard, we believe that recipients need more delicate monitoring in the post-transplant period. Since this category of patients requires a multi-team approach, which should include: hepatologist, surgeon, endoscopist.

The success rate of our experience in eliminating such complications at the initial stage was not high enough. However, with the accumulation of experience, on time begin correction and the necessary resources, the number of unsuccessful ERCP interventions decreased. In addition, we considering that the development of AS could be associated with the technical aspects of biliary anastomosis.

Conclusion

The endoscopic retrograde method of treatment is the most effective, at the first sign of the development of biliary strictures after LDLT. However, if technical difficulties are happened, recommended to use the PTBD (Rendezvous, MCA) to provide access to the papilla. After that endoscopist should treat recipients.

References

1. Khosravi B, Pourahmad S, Bahreini A, Nikeghbalian S, Mehrdad G. Five years survival of patients after liver transplantation and its effective factors by neural network and cox poroportional hazard regression models. Hepatitis 2015; 15:9.
2. Villa NA, Harrison ME. Management of biliary strictures after liver transplantation. Gastroenterol Hepatol 2015; 11:316-28.
3. Ryu CH, Lee SK. Biliary strictures after liver transplantation. Gut Liver 2011; 5:133-42.

4. Lee HW, Shah NH, Lee SK. An update on endoscopic management of post-liver transplant biliary complications. Clin Endosc 2017; 50:451-463.
5. Guichelaar MM, Benson JT, Malinchoc M, Krom RA, Wiesner RH, Charlton MR. Risk factors for and clinical course of non-anastomotic biliary strictures after liver transplantation. Am J Transplant 2003; 3:885-890.
6. Pascher A, Neuhaus P. Bile duct complications after liver transplantation. Transpl Int 2005;18:627-642.
7. Linhares MM, Gonzalez AM, Goldman SM, Coelho RD, Sato NY, Moura RM, et al. Magnetic resonance cholangiography in the diagnosis of biliary complications after orthotopic liver transplantation. Transplant Proc 2004; 36:947-948.
8. Meersschaut V, Morteleş KJ, Troisi R, Van Vlierberghe H, De Vos M, Defreyne L, et al. Value of MR cholangiography in the evaluation of postoperative biliary complications following orthotopic liver transplantation. Eur Radiol 2000;10:1576-1581.
9. Akamatsu N, Sugawara Y, Hashimoto D. Biliary reconstruction, its complications and management of biliary complications after adult liver transplantation: a systematic review of the incidence, risk factors and outcome. Transpl Int. 2011;24:379–92.
10. Sharma S, Gurakar A, Jabbour N. Biliary strictures following liver transplantation: past, present and preventive strategies Liver Transpl. 2008;14:759–69.
11. Mahajani RV, Cotler SJ, Uzer MF. Efficacy of endoscopic management of anastomotic biliary strictures after hepatic transplantation. Endoscopy 2000;32:943-949.
12. Rossi AF, Grosso C, Zanasi G, Gambitta P, Bini M, De Carlis L, et al. Long-term efficacy of endoscopic stenting in patients with stricture of the biliary anastomosis after orthotopic liver transplantation. Endoscopy 1998; 30: 360-366.
13. Morelli J, Mulcahy HE, Willner IR, Cunningham JT, Draganov P. Long-term outcomes for patients with post-liver transplant anastomotic biliary strictures treated by endoscopic stent placement. Gastrointest Endosc 2003;58: 374-379.
14. Itoi T, Yamanouchi E, Ikeuchi N, Kasuya K, Iwamoto H, Tsuchida A. Magnetic compression duct-to-duct anastomosis for biliary obstruction in a patient with living donor liver transplantation. Gut Liver 2010;4 Supplement 1:S96-S98.
15. Dumonceau JM, Tringali A, Blero D, et al; European Society of Gastrointestinal Endoscopy. Biliary stenting: indications, choice of stents and results: European Society of Gastrointestinal Endoscopy (ESGE) clinical guideline. Endoscopy 2012; 44:277-298.
16. Chathadi KV, Chandrasekhara V, Acosta RD, et al; ASGE Standards of Practice Committee. The role of ERCP in benign diseases of the biliary tract. Gastrointest Endosc 2015; 81:795-803.
17. Biliary stenting: Indications, choice of stents and results: European Society of Gastrointestinal Endoscopy (ESGE) clinical guideline Endoscopy 2012; 44: 277–292
18. Tringali A, Barbaro F, Pizzicannella M, Boҡkoski I, Familiari P, Perri V, et al. Endoscopic management with multiple plastic stents of anastomotic biliary stricture following liver transplantation: long-term results. Endoscopy 2016; 48: 546-51.
19. Prophylaxis of post-ERCP pancreatitis: European Society of Gastrointestinal Endoscopy (ESGE) Guideline – Updated June 2014 Endoscopy 2014; 46: 799–815
20. Morelli J, Mulcahy HE, Willner IR, Cunningham JT, Draganov P. Long-term outcomes for patients with post-liver transplant anastomotic biliary strictures treated by endoscopic stent placement. Gastrointest Endosc 2003;58: 374-379.
21. Schwartz DA, Petersen BT, Poterucha JJ, Gostout CJ. Endoscopic therapy of anastomotic bile duct strictures occurring after liver transplantation. Gastrointest Endosc 2000;51:169-174.
22. Hsieh TH, Mekeel KL, Crowell MD, et al. Endoscopic treatment of anastomotic biliary strictures after living donor liver transplantation: outcomes after maximal stent therapy. Gastrointest Endosc. 2013;77:47–54.
23. Kawano Y, Mizuta K, Hishikawa S, et al. Rendezvous penetration method using double-balloon endoscopy for complete anastomosis obstruction of hepaticojejunostomy after pediatric living donor liver transplantation. Liver Transpl. 2008;14:385–7.
24. Bing Hu, Bo Sun, Qiang Cai et.al Asia-Pacific consensus guidelines for endoscopic management of benign biliary strictures. Gastrointestinal Endoscopy Volume 86, No. 1 : 2017

SECONDARY PREVENTION OF SUDDEN CARDIAC DEATH IN PATIENT WITH LONG QT SYNDROME

УДК 616.12-008.313.315

Baimbetov A.K., Bizhanov K.A., Bairamov B.A., Sagatov I.Y.
Interventional Cardiology and Arrhythmology Department,
A.N. Syzganov's National Scientific Center of Surgery, Almaty, Kazakhstan

Abstract

Congenital long QT syndrome (LQTS) is an abnormally prolonged repolarization of the stomach due to hereditary defects in the sodium and potassium channels of the heart, which predispose patients with syncope, gastrointestinal arrhythmias, and sudden cardiac death. Early diagnosis and prophylactic treatment play an important role in preventing sudden cardiac death in patients with congenital LQTS. The diagnostic criteria for congenital LQTS are based on specific electrocardiographic data, clinical data, and adrenaline test results. Recently, a genotype-specific electrocardiographic pattern of congenital LQTS has also been described. Recent studies suggest the feasibility of genotype-specific treatment for LQTS, and soon, mutation-specific treatment is likely to become a new approach to this potentially deadly syndrome.

We present a case report that is verified by electrocardiographic and clinical diagnostic criteria, indicating LQTS. In this case, the cardioverter-defibrillator is implanted to the patient for the secondary prevention of sudden cardiac death. The patient experiences attacks of sudden palpitations with fainting, and the implanted defibrillator leads therapy from life-threatening ventricular tachycardia.

ABOUT THE AUTHORS

Bizhanov Kenzhebek Alibekovich *– JSC National Scientific Center of Surgery named after A.N.Syzganov, Department of Interventional Cardiology, Arrhythmology and Endovascular Surgery, interventional cardiologist*

Baimbetov Adil Kudaibergenovich *– JSC National Scientific Center of Surgery named after A.N. Syzganov, Department of Interventional Cardiology, Arrhythmology and Endovascular Surgery, Head of department, interventional cardiologist*

Bairamov Binali Amrulaevich *– JSC National Scientific Center of Surgery named after A.N.Syzganov, Department of Interventional Cardiology, Arrhythmology and Endovascular Surgery, interventional cardiologist*

Sagatov Inkar Yergalievich *– JSC National Scientific Center of Surgery named after A.N. Syzganov, Head of Research Management*

Keywords
sudden cardiac death, secondary prevention

Ұзартылған QT синдромы бар пациентте кенеттен болатын жүрек өлімін екінші реттік алдын алу

Баимбетов Ә.Қ., Бижанов К.Э., Байрамов Б.А., Сағатов І.Е.
Интервенциялық кардиология және аритмология бөлімі,
А. Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығы, Алматы, Қазақстан

Аңдатпа

Туа біткен ұзартылған QT интервалы синдромы (ҰИСQT) пациенттерді синкопальды күй, қарыншалық аритмия және кенеттен болатын жүрек өліміне әкеп соқтыратын жүректің калий және натрий каналдарындағы тұқым қуалайтын ақауларға байланысты қарыншалардың аномалды созылмалы реполяризациясы деп сипатталады. Туа біткен ҰИСQT бар пациенттерде кенеттен болатын жүрек өлімін алдын алуда ерте диагностика және профилактикалық емдеу маңызды рөл атқарады. Туа біткен ҰИСQT-тің диагностикалық критерийлері электрокардиографиялық деректерге, клиникалық деректерге және адреналиннің тест нәтижелеріне негізделеді. Жақында генотипке тән туа біткен ҰИСQT электрокардиографиялық паттерн сипатталды. Таяуда жүргізілген зерттеулер бойынша, ҰИСQT-тың генотип-спецификалық емі жүзеге асырылады. Сондай-ақ болашақта мутацияға бейім емдеу осы потенциалды қауіпті синдромды емдеудің жаңа әдісіне айналады. Біз ұзартылған QT синдромы бар, электрокардиографиялық және клиникалық диагностикалық критерийлер арқылы расталған клиникалық жағдайды ұсынамыз. Бұл жағдайда пациетке кенеттен болатын жүрек өлімін екінші реттік алдын алу үшін кардиовертер-дефибриллятор имплантталған. Пациентте кенеттен болатын жүрек ұстамасы, талып қалу байқалған. Имплантталған дефибриллятор өмірге қауіпті қарыншалық тахикардиядан құтқару терапиясын жүргізеді.

АВТОРЛАР ТУРАЛЫ

Бижанов Кенжебек Әлібекұлы *– А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығының интервенциялық кардиология, аритмология және эндоваскулярлық хирургия бөлімшесінің дәрігері, интервенциялық кардиолог*

Баимбетов Әділ Құдайбергенұлы *– А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығының интервенциялық кардиология, аритмология және эндоваскулярлық хирургия бөлімшесінің меңгерушісі, интервенциялық кардиолог*

Байрамов Бинали Амрулаұлы *– А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығының интервенциялық кардиология, аритмология және эндоваскулярлық хирургия бөлімшесінің дәрігері, интервенциялық кардиолог*

Сағатов Іңкәр Ерғалиұлы *– А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығының ғылыми-зерттеу менеджменті бөлімінің басшысы*

Түйін сөздер
кенеттен болатын жүрек өліміб екіншілік алдын алу

Вторичная профилактика внезапной сердечной смерти у пациента с синдромом удлиненного QT

ОБ АВТОРАХ

Бижанов Кенжебек Алибекович – *отделение интервенционной кардиологии, аритмологии и эндоваскулярной хирургии АО «Национальный научный центр хирургии имени А.Н. Сызганова», интервенционный кардиолог*

Баимбетов Адиль Кудайбергенович – *отделение интервенционной кардиологии, аритмологии и эндоваскулярной хирургии АО «Национального научного центра хирургии имени А.Н. Сызганова», заведующий отделением, интервенционный кардиолог*

Байрамов Бинали Амрулаевич – *отделение интервенционной кардиологии, аритмологии и эндоваскулярной хирургии АО «Национальный научный центр хирургии имени А.Н. Сызганова», интервенционный кардиолог*

Сагатов Инкар Ергалиевич – *руководитель отдела менеджмента научно-исследовательских работ АО «Национальный научный центр хирургии имени А.Н. Сызганова»*

Ключевые слова
внезапная сердечная смерть, вторичная профилактика

Баимбетов А.К., Бижанов К.А., Байрамов Б.А., Сагатов И.Е.
Отделение интервенционной кардиологии и аритмологии,
Национальный научный центр хирургии им. А. Н. Сызганова, Алматы, Казахстан

Аннотация

Врожденный синдром удлиненного интервала QT (СУИQT) характеризуется аномально продолжительной реполяризацией желудочков из-за наследственных дефектов в натриевых и калиевых каналах сердца, которые предрасполагают пациентов к синкопальным состояниям, желудочковым аритмиям и внезапной сердечной смерти. Ранняя диагностика и профилактическое лечение играют важную роль в предотвращении внезапной сердечной смерти у пациентов с врожденным СУИQT. Диагностические критерии врожденного СУИQT основаны на определенных электрокардиографических данных, клинических данных и результатах теста на адреналин. Недавно также был описан специфический для генотипа электрокардиографический паттерн врожденной СУИQT. Недавние исследования предполагают выполнимость генотип-специфического лечения СУИQT, и в ближайшем будущем специфичное для мутаций лечение, вероятно, станет новым подходом к этому потенциально смертельному синдрому. Мы представляем клинический случай, который подтверждается электрокардиографическими и клиническими диагностическими критериями, свидетельствующий о синдроме удлиненного QT. В данном случае, пациентке был имплантирован кардиовертер-дефибриллятор для вторичной профилактики внезапной сердечной смерти. У пациентки возникают приступы внезапного сердцебиения с обмороками, и имплантированный дефибриллятор проводит спасительную терапию от жизенугрожающей желудочковой тахикардии.

Case Report

A 25-year-old woman who was recently diagnosed with an attack was taken by an ambulance service to an emergency hospital. The patient notes sudden attacks of loss of consciousness with spontaneous resolution within a few minutes over the past 4-5 months. From the family history, it was found out that the mother suddenly died at a younger age, and then the older brother also died from sudden death at an early age. Patient's hemodynamic parameters were stable. A 12-lead ECG showed the QT interval duration - 570 msec (Figure 1) and a corrected QT interval was calculated - 700 msec. The presence of U waves correlating with its low potassium levels of 3.3. The clinical condition of the patient quickly improved, but already in the intensive care unit, a new attack of a sudden heartbeat arose. A wide complex polymorphic ventricular tachycardia was recorded on the monitor, which recovered to the sinus rhythm within a few seconds. After the initial episode, the patient had two more episodes of ventricular tachycardia over the next few minutes, which resolved spontaneously after 5-7 seconds. A serial ECG performing in the intensive care unit revealed a prolonged QT interval, which gradually decreased to a standard duration of 2 days. Given the history of sudden cardiac deaths in the family and episodes similar to patient events, a congenital long QT syndrome was diagnosed, and implantation of a cardioverter-defibrillator was planned for the secondary prevention of sudden cardiac death. Prescribed therapy

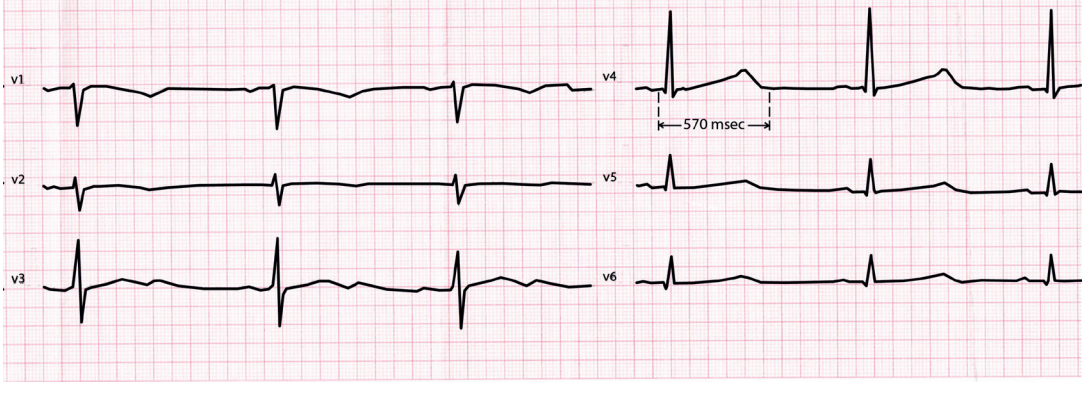


Figure 1. Patient's ECG shows a prolonged QT interval – 570 msec.

with titration of doses of beta-blockers depending on blood pressure. Then the patient was transferred to the arrhythmology department of our centre for further observation, and a cardioverter-defibrillator was implanted. A few days later, the patient was discharged home after electrolyte correction, with an improvement in the general condition of the patient. Later, the patient had another attack, and during follow up of the ICD, she recorded cognitive therapy for polymorphic ventricular tachycardia. (Report fragments are shown in Figure 2.)

Discussion

The QT interval is an indicator of the electrical activity of the heart, in particular the repolarization of the cell membrane. It is well known that the absolute QT interval provides a superficial visualization of the duration of the main action of the cell. Despite the coincidence of QTc at rest between healthy people and patients with LQTS, a 12-lead ECG remains one of the available methods for detecting LQTS, and the base QTc interval is one of the main diagnostic criteria.

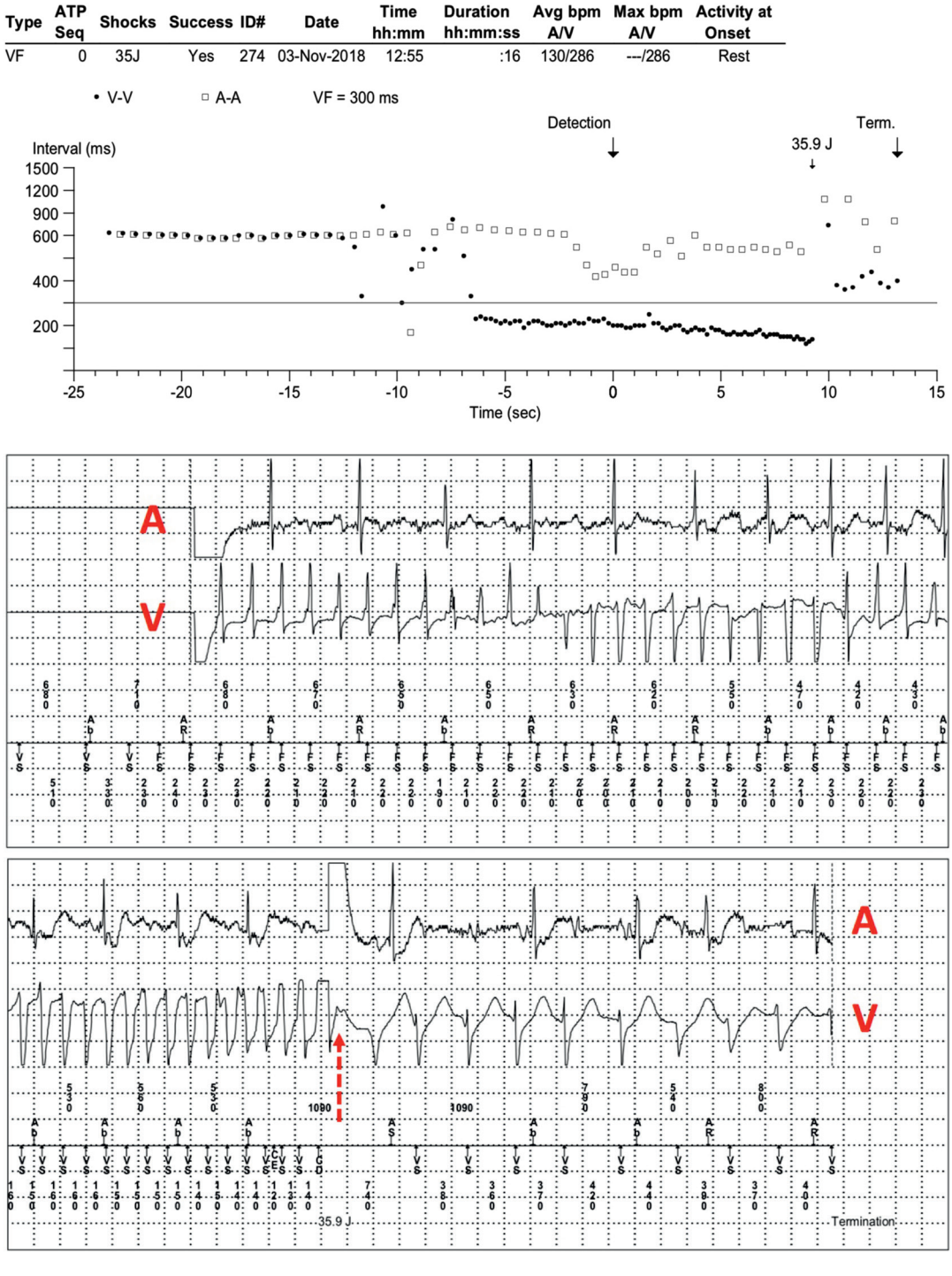


Figure 2.
Fragments from the patient's device report: a) Plot shows the sudden onset of ventricular tachycardia (more 200 bpm), the device has detection in time, and for 9 seconds applies therapy with 36 Joules, at the end sinus rhythm was accurately recovered. b) An electrogram episode of the onset of ventricular "torsade de point type" tachycardia is shown, then it passes into ventricular fibrillation. A cardioversion of 36 joules stops a life-threatening tachycardia. A-atrial channel, V-ventricular channel, the arrow indicates the time of the shock delivery.

Of most considerable diagnostic importance is the significant prolongation of the QT interval, paroxysms of tachycardia torsades de pointes, and syncope episodes. Congenital long QT syndrome is a genetically heterogeneous disease in which more than five different chromosome loci are involved. At least four genes have been identified that determine the development of congenital prolongation of the QT interval. The most common form of long QT syndrome in young people is the combination of this syndrome with mitral valve prolapse. The detection rate of QT interval prolongation in individuals with mitral and/or tricuspid valve prolapse reaches 33%. Congenital LQTS is a potentially life-threatening condition caused by mutations in the genes encoding the ion channels of the heart, which lead to an increase in the ventricular action potential. Genetic testing of symptomatic patients or their asymptomatic family members can identify patients at risk for life-threatening arrhythmias and a type of prolonged QT, as this has important management implications. Three forms (LQT1, LQT2 and LQT3) from congenital LQTS form, have been well characterized. These three forms have also been described better based on their specific ECG morphology. Recent studies show that even in patients with acquired LQTS (for example, as a result of taking drugs prolonging QT), there are clinically silent gene mutations that lead to explicit QT prolongation only when exposed to drugs prolonging QT [7]. This explains why some patients are more likely than others to QT interval prolongation at a given dose of prolonged medication, even after adjusting for other factors that can make longer the QT interval. The clinical course of congenital LQTS is highly dependent on the gene. Although cardiac events are more frequent and occur at a younger age in patients with LQT1 and LQT2, they are potentially more deadly in patients with the LQT3 genotype. Patients with LQT1 and LQT2 genotypes usually benefit from high-dose beta-blocker therapy. However, patients with LQT3 are at higher risk at a lower heart rate and could potentially benefit from pace stimulation. Besides, they shorten their QT interval longer with sodium channel blockers [8]. In order to prevent cardiac troubles, drugs such as adrenaline, antihistamines, erythromycin, trimethoprim, quinidine, procainamide, disopyramide, sotalol and others, cisapride, ketoconazole, fluconazole, intraconazole, tricyclic antidepressants, phenothiidiadiuret derivatives, others are excluded [9]. According to international recommendations, β-blockers are the drug of choice [10,11]. In this series, the first drug is propranolol. Doses of drugs are selected individually, focusing on the response received. Antiadrenergic therapy is effective in most patient with LQTS, reducing the risk of arrhythmias and reducing the duration of the QT interval. It should be noted that a break in taking β-blockers is fraught with cardiac complications. The response to β-blockers and mexiletine depends on the type of mutation and trigger factors. In particular, mexiletine in people with LQT3 syndrome with a protein mutation of F1473 exacerbates further prolongation of QT interval [12]. In LQT1 syndrome, β-blockers are effective if physical exertion is a provoking factor, but not valid if rhythm disturbances occur in a dream [13]. Emergency therapy is aimed at stopping episodes of torsades de pointes and sudden death and includes the exclusion of provocative agents, intravenous administration of solutions of potassium, magnesium, less often isoproterenol. In patients with frequent life-threatening rhythm disturbances of the high-risk group for sudden death, the implantation of cardioverter-defibrillator is mandatory [14].

Conclusion

Timely diagnosis of QT interval prolongation and its dispersion, including during Holter monitoring, ECG and during exercise tests, will highlight a group of patients with an increased risk of developing ventricular arrhythmias, syncope and sudden death. Beta-blockers, in combination with magnesium, are effective agents for the prevention and treatment of ventricular cardiac arrhythmias in patients with congenital and acquired forms of long QT syndrome. The described clinical case report clearly demonstrates that the implantation of a cardioverter-defibrillator is an effective and safe method for the prevention of sudden cardiac death in patients with long QT syndrome.

References

1. Mullally J., Goldenberg I., Moss A. et al. Risk of life-threatening cardiac events among patients with long QT syndrome and multiple mutations. Heart Rhythm 2013; 10 (3): 378-382.
2. Surawicz B., Knilans T. Chou's Electrocardiography in clinical practice. 6th. ed. Saunders Elsevier. 2008.
3. Schwartz P.J., Crotti L., Insolia R. Long-QT syndrome: from genetics to management. Circulation 2012; 5 (4):868–877.
4. Moss AJ, Zareba W, Kaufman ES. Increased risk of arrhythmic events in long QT syndrome with mutations in the pore region of the human ether-a-a-go-go-related gene potassium channel. Circulation. 2002; 105:794–9.
5. Schwartz P.J., Stramba-Badiale M., Crotti L. et al. Prevalence of the Congenital Long QT Syndrome. Circulation 2009; 120 (18):1761–1767.
6. Priori S.G., Schwartz P.J., Napolitano C. et al. Risk

stratification in the long QT syndrome. N Engl J Med 2003; 348:1866–1874.
7. Mitcheson JS, Chen J, Lin M, et al. A structural basis for drug-induced long-QT syndrome. Proc Natl Acad Sci USA. 2000; 97: 12329–1233.
8. Schwartz P., Priori S., Spazzolini C., et al. Genotype-phenotype correlation in the long-QT syndrome: gene-specific triggers for life-threatening arrhythmias. Circulation. 2001; 103:89–95.
9. Priori SG, Napolitano C, Schwartz PJ. Low penetrance in the long QT syndrome: clinical impact. Circulation. 1999; 99:529–33.
10. Moss A., Zareba W., Hall W. et al. Effectiveness and limitations of beta-blocker therapy in congenital long-QT syndrome. Circulation. 2000; 101:616–23.
11. Shimizu W, Antzelevitch C. Differential response to beta-adrenergic agonists and antagonists in LQT1, LQT2 and LQT3 models of the long QT syndrome. J Am Coll Cardiol. 2000; 35:778–86.
12. Barsheshet A., Goldenberg I., O-Uchi J. et al. Mutations in cytoplasmic loops of the KCNQ1 channel and the risk of life-threatening events: implications for mutation-specific response to beta-blocker therapy in type 1 long-QT syndrome. Circulation 2012; 125:1988– 1996.
13. Viskin S. Long QT syndromes and torsades de pointes. Lancet. 1999; 354: 1625–33.
14. Schwarttz P.J., Spazzolini C., Priori S.G. et al. Who Are the Long QT Syndrome Patients Who Receive an Implantable Cardioverter Defibrillator and What Happens to Them? Data from the European Long-QT Syndrome Implantable Cardioverter-Defibrillator (LQTS ICD) Registry. Circulation 2010; 122: 1272–1282.

УДК 616-089.1

COMPARATIVE ANALYSIS OF THE EFFECTIVENESS OF MINIMALLY INVASIVE SURGICAL INTERVENTIONS FOR KIDNEY STONES

Mami D.E.[1,2], Alchinbaev M.K.[1], Sengirbaev D.I.[1], Malikh M.A.[2]
[1]NJSC "National Medical University named after S.D. Asfendiyarov"
[2]JSC "Scientific Center of Urology named after B.U. Dzharbusynov",
urolithiasis and Endourology Department, Almaty, Kazakhstan

ABOUT THE AUTHORS

Mami Darkhan Erlanuly - *a resident mentor at the Department of Urology of the NJSC "National Medical University named after S.D. Asfendiyarov", doctor in Department of urolithiasis and Endourology, JSC "Scientific Center of Urology named after B.U. Dzharbusynov". Darhan.md@gmail.com, +77017107374*

Alchinbaev Mirzakarim Karimovich - *Head of the Department of Urology, NJSC "National Medical University named after S.D. Asfendiyarov", Academician of the National Academy of Sciences of the Republic of Kazakhstan, Doctor of Medicine, Professor.*

Sengirbaev Daurenbek Isakovich - *Professor of the Department of Urology of the NJSC "National Medical University named after S.D. Asfendiyarov", Ph.D.*

Malikh Mohammad Aref - *Head of the Department of urolithiasis and Endourology of the JSC "Scientific Center of Urology named after B.U. Dzharbusynov", MD, professor.*

Abstract

Urolithiasis is an urgent worldwide public health problem, as it remains one of the most common diseases. Therefore, the study of factors that increase the effectiveness and safety of treatment of patients with nephrolithiasis is an important task of urology. This article provides a comparative analysis of the effectiveness of minimally invasive methods, such as retrograde pyelolithotripsy (RPL) and percutaneous nephrolithotripsy (PCNL) for nephrolithiasis. ***Purpose of the study.*** *Conduct a comparative assessment of the effectiveness of minimally invasive treatment for kidney stones.* ***Materials and methods.*** *In the study, 109 patients with kidney stones who were hospitalized at the Scientific Center of Urology from 2017 to 2018. Retrograde pyelolithotripsy (RPT) was performed in 66 (60.5%) patients. Percutaneous nephrolithotripsy (PCNL) in 43 (39.4%) patients. Of these, 54 (49.5%) are men and 55 (50.5%) are women.* ***Conclusion:*** *A comparative analysis of the results of treatment of patients with kidney stones showed that RPT is not inferior to PCNL in its effectiveness. Moreover, the percentage of intraoperative and postoperative complications is higher with PCNL. The effectiveness of PCNL immediately after surgery was 76.5%, RPT - 78.8%. Efficiency after 1 month was 82.8% and 88.1%, respectively. After PCNL, a significant decrease in glomerular filtration rate is determined, which is not observed after RPT. Improving the surgical treatment of urolithiasis will improve the quality of life of the population suffering from urolithiasis, reduce the incidence and disability of the population, reduce the length of hospital stay and rehabilitation.*

Keywords
RPT, PCNL, nephrolithiasis

Бүйрек тастары кезінде емдеудің кіші инвазивті әдістерінің тиімділігіне салыстырмалы талдау жүргізу

Мәми Д.Е.[1,2], Алчинбаев М.К.[1], Сенгирбаев Д.И.[1], Малих М.А.[2]
[1]НАО «Национальный медицинский университет, им. С.Д. Асфендиярова»
[2]АО «Научный центр урологии им. Б.У. Джарбусынова», кафедра урологии,
отделении МКБ и эндоурологии, Алматы, Қазақстан

АВТОРЛАР ТУРАЛЫ

Мәми Дархан Ерланұлы *– наставник резидентов на кафедре урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова». Darhan.md@gmail.com, +77017107374*

Алчинбаев Мирзакарим Каримович *– заведующий кафедрой урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», Академик НАН РК, д.м.н., профессор.*

Сенгирбаев Дауренбек Исакович *– профессор кафедры урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», к.м.н.*

Малих Мохаммад Ареф *– заведующий отделением МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова», д.м.н., профессор.*

Аңдатпа

Несеп-тас ауруы әлемдегі денсаулық сақтаудың өзекті мәселесі болып табылады, өйткені ең көп таралған аурулардың бірі болып табылады. Сондықтан нефролитиазы бар науқастарды емдеудің тиімділігі мен қауіпсіздігін арттыратын факторларды зерттеу урологияның маңызды міндеті болып табылады. Бұл мақалада нефролитиаз кезіндегі ретроградты пиелолитотрипсия (РПЛ) және перкутанды нефролитотрипсия (ПНЛТ) сияқты кіші инвазивті әдістер тиімділігінің салыстырмалы талдауы келтірілген. ***Зерттеудің мақсаты.*** *Бүйрек тастары кезінде емдеудің кіші инвазивті әдістерінің тиімділігіне салыстырмалы бағалау жүргізу.* ***Материалдар мен әдістер.*** *Зерттеу барысында біз бүйрек тастары бар 109 науқасты іріктеп алдық, олар 2017-2018 жылдар аралығында Урология ғылыми орталығында жатқызылды. Оның ішінде 54 (49,5%) ерлер және 55 (50,5%) әйелдер болған.* ***Қорытынды:*** *бүйрек тастары бар пациенттерді емдеу нәтижелеріне жүргізілген салыстырмалы талдау ретроградты пиелолитотрипсия (РПЛ) өзінің тиімділігі бойынша перкутанды пиелолитотрипсиядан (ПНЛТ) кем түспейтінін көрсетті. Ота кезіндегі және отадан кейінгі асқынулардың пайызы ПНЛТ әдісі кезінде РПЛ әдісіне қарағанда жоғары. ПНЛТ тиімділігі отадан кейін бірден 76,5% – ды, РПЛ-78,8% - ды құрады. 1 айдан кейін тиімділік тиісінше 82,8% және 88,1% құрады. ПНЛТ отасынан кейін шумақтық сүзу жылдамдығының айтарлықтай төмендеуі анықталады, бұл РПЛ әдісінде байқалмайды. Хирургиялық емдеуді жақсарту несеп-тас аурумен (НТА) ауыратын халықтың өмір сүру сапасын жақсартады, халықтың аурушаңдығы мен мүгедектілігін азайтады, ауруханада болу және оңалту ұзақтығын қысқартады.*

Түйін сөздер
РПЛ, ПНЛТ, нефролитиаз

Сравнительный анализ эффективности малоинвазивных оперативных вмешательств при камнях почек

Мами Д.Е.[1,2], Алчинбаев М.К.[1], Сенгирбаев Д.И.[1], Малих М.А.[2]
[1]НАО «Национальный медицинский университет, им. С.Д. Асфендиярова»
[2]АО «Научный центр урологии им. Б.У. Джарбусынова», кафедра урологии, отделении МКБ и эндоурологии, Алматы, Казахстан

Аннотация

Мочекаменная болезнь является одной из актуальных проблем медицинской отрасли во всем мире, так как остается одним из самых распространенных заболеваний. Поэтому исследование факторов, повышающих эффективность и безопасность лечения пациентов с нефролитиазом, является важной задачей урологии. В этой статье приведен сравнительной анализ эффективности малоинвазивных методов, как ретроградная пиелолитотрипсия (РПЛ) и перкутанная нефролитотрипсия (ПНЛТ) при нефролитиазе. ***Цель исследования.*** *Провести сравнительную оценку эффективности малоинвазивных методов лечения при камнях почек.* ***Материалы и методы.*** *В работе проведены исследования 109 пациентам с конкрементами в почках, которые были госпитализированы в Научный центр урологии с 2017 по 2018 год. Ретроградная пиелолитотрипсия (РПЛ) была выполнена 66 (60,5%) пациентам. Перкутанная нефролитотрипсия (ПНЛТ) 43 (39,4%) пациентам. Из них 54 (49,5%) мужчин и 55 (50,5%) женщин.* ***Выводы:*** *Проведенный сравнительный анализ результатов лечения пациентов с конкрементами почек показал, что РПЛ по своей эффективности не уступает ПНЛТ. При этом процент интраоперационных и послеоперационных осложнений выше при ПНЛТ. Эффективность ПНЛТ сразу после операции составила 76,5%, РПЛ – 78,8%. Эффективность через 1 месяц составила 82,8% и 88,1% соответственно. После ПНЛТ определяется существенное снижение скорости клубочковой фильтрации, что не наблюдается после проведении РПЛ. Совершенствование хирургического лечения МКБ улучшит качество жизни населения, страдающего МКБ, снижение заболеваемости и инвалидизации населения, сокращает сроки пребывания в стационаре и реабилитации.*

ОБ АВТОРАХ

Мәми Дархан Ерланұлы *– наставник резидентов на кафедре урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова». Darhan.md@gmail.com, +77017107374*

Алчинбаев Мирзакарим Каримович *– заведующий кафедрой урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», Академик НАН РК, д.м.н., профессор.*

Сенгирбаев Дауренбек Исакович *– профессор кафедры урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», к.м.н.*

Малих Мохаммад Ареф *– заведующий отделением МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова», д.м.н., профессор.*

Ключевые слова
РПЛ, ПНЛТ, нефролитиаз

Introduction

Urolithiasis remains one of the most common urological diseases. The level of morbidity and disability among the population of the Republic of Kazakhstan is increasing every year, and most often among people of working age - 20 - 50 years. Patients with urolithiasis constitute for 30 - 40% of the total contingent of the urological hospital. The annual increase in the incidence of urolithiasis is 3-6%. In the period from 2010 to 2016, this indicator in Kazakhstan increased from 60.1 to 73.4 cases per 100 thousand people. The dynamics of the incidence of urolithiasis in the republic as a whole in 2016 in comparison with 2014. increased by 7.9%, and in relation to 2015 an increase of 2.7% was noted. Noticeable increase in incidence in 2016 in comparison with 2015, it was revealed in the city of Nur-Sultan - from 1204 cases to 2230. A decrease in the indicator was noted in Atyrau and Aktobe regions. The incidence of urolithiasis in 2016 per 100 thousand people in the republic as a whole was 76.6 (in 2016 - 75.5 in 2015 - 75.5, in 2014 - 713.4), with the highest indicators (higher than the republican one), as in 2014, were noted in the Zhambyl (211.7) region and the city of Nur-Sultan (287.1). The lowest rates were found in West Kazakhstan (13.1), Karaganda (44.9), Almaty (44.5) regions. [1]. In the Russian Federation in 2012, the incidence was 550.5 people per 100 thousand people, and its growth over the period from 2002 to 2012 exceeded 25%. In 2017, the incidence of urolithiasis was 177 people per 100 thousand population. In 2017, 207, 447 adult patients with an urolithiasis diagnosed for the first time in their life were registered in the Russian Federation, and the increase in incidence over the past 10 years exceeded 25% [2-3]. In the USA, nephrolithiasis is one of the main causes of urinary tract morbidity. The prevalence of this disease has increased over the past 20 years from 3.8% to 5.2% [4]. The annual incidence of urolithiasis in the world is 0.5-5.5%, and in some countries and areas endemic for the urolithiasis - 13-20% [5-6]. In recent decades, the focus is on the development and widespread introduction of contact lithotripsy and other modern high-tech treatment methods. At the same time, publications on diagnostic and treatment methods for urolithiasis are estimated in the thousands, while the prevalence of urolithiasis, the changing age composition of patients and gender distribution, the structure of urinary stones, exogenous and endogenous risk factors for the disease are rarely discussed in print [7-8].

The aim: Conduct a comparative analysis of the effectiveness of minimally invasive treatment for kidney stones.

In the study, 109 patients with kidney stones who were studied and hospitalized at the Scientific Center of Urology from 2017 to 2018. Retrograde pyelolithotripsy (RPT) was performed in 66 (60.5%) patients. Percutaneous nephrolithotripsy (PCNL) in 43 (39.4%) patients. Of these, 54 (49.5%) are men and 55 (50.5%) are women.

Table 1.
Indicators of patients after the RPT and PCNL.

	RPT	PCNL
Indicators	Amount	
Amount of patients	66	43
Male	25 (37,9%)	29 (67,4%)
Female	41 (62,1%)	14 (32,6%)
The average size of the calculus	2,1±1,5 см	3±1,6 см
The average density of calculus	644,2±212 HU	
Diabetes	7 (63,6%)	4 (36,4%)
Arterial hypertension	21 (58,3%)	15 (41,7%)

Results

Retrograde pyelolithotripsy (RPT) was performed with single calculi of the pelvis. The main conditions for the RPT were the lack of expansion of the pyelocaliceal system, the thickness of the parenchyma is more than 1.7 cm, i.e. conditions that impede PCNL; anatomical and physiological structural features of the pyelocaliceal system, which complicate other interventions (intrarenal pelvis, narrow isthmus of the calyx). No intraoperative complications were observed. In 7 patients (10.6%), exacerbation of calculus pyelonephritis and reflux was noted after the installation of a stent catheter.

During percutaneous nephrolithotripsy, 4 patients (9.3%) experienced intraoperative bleeding, which required the separation of the PCNL procedure into 2 stages. In one case (2.3%), a conversion was required with open surgery (pyelolithotomy). An exacerbation of pyelonephritis was observed in 5 patients (11.6%).

The effectiveness of the operation was evaluated by the degree of purification of the renal cavity system from calculi. The operation was considered effective with complete extraction of calculus or in the presence of residual fragments less than 4 mm in size, which reduces the length of hospital stay and rehabilitation.

The average size of the removed calculi with RPT was 2.1 ± 1.5 cm, with PCNL 3 ± 1.6 cm. 11 patients had diabetes mellitus in the stage of compensation, 36 patients had arterial hypertension. The effectiveness of PCNL immediately after surgery was 76.5%, RPT - 78.8%. The effectiveness of treatment after 1 month was 82.8% and 88.1%, respectively. No statistically significant differences were found.

When assessing the functional state of the kidneys after PCNL (glomerular filtration rate of GFR), it was found that the average level of GFR before surgery was 108.8 ± 20.5 ml / min. After 1 month, in the control study, the average GFR level was 74.4 ± 12.8 ml / min. After 6 months, control was performed on 32 patients. The average level of GFR was 86.6 ± 20.2 ml / min. Persistent renal failure was detected in 10 patients. The average level of GFR before RPT was 112.3 ± 17.6 ml / min. 6 months after surgery, the average level of GFR was 105.5 ± 18.1 ml / min.

Conclusion

A comparative analysis of the results of treatment of patients with kidney stones showed that RPT is not inferior to PCNL in its effectiveness. Moreover, the percentage of intraoperative and postoperative complications is higher with PCNL.

The effectiveness of PCNL immediately after surgery was 76.5%, RPT - 78.8%. Efficiency after 1 month was 82.8% and 88.1%, respectively.

After PCNL, a significant decrease in glomerular filtration rate is determined, which is not observed after RPT. Improving the surgical treatment of urolithiasis will improve the quality of life of the population suffering from urolithiasis, reduce the incidence and disability of the population, reduce the length of hospital stay and rehabilitation.

References

1. Alchinbaev M.K., Mukhamedzhan I.T., Aubakirova A.T., Dakenova G.B. Analysis of the state of the urological service of the Republic of Kazakhstan // Analytical review for 2016 (sixth edition) // Almaty, 2017 - 18-19 pp.
2. Apolikhin O. I., Sivkov A. V., Moskaleva N. G., Solntseva T. V., Komarova V. A. // Analysis of the uronephrological morbidity and mortality in the Russian Federation over a ten-year period (2002-2012) according to official statistics // Experimental and clinical urology. 2014. N 2. C. 2-12.
3. Statistical compilation 2017 // Incidence of the adult population of Russia in 2017 // statistical materials, part III // Table 3.68. - p. 139. Moscow 2018.
4. Brener Z.Z. // Nephrolithiasis: evaluation and management // South Med. J. 2011. Vol. 104, suppl. 2. P. 133-139.
5. Fisang C., Anding R., Mьller S.C, Latz S., Laube N. // Urolithiasis an interdisciplinary diagnostic, therapeutic and secondary preventive challenge. // Dtsch Arztebl Int. 2015; 112 (6):83-91. doi: 10.3238/arztebl.2015.0083.
6. Knoll T. Epidemiology, Pathogenesis, and Pathophysiology of Urolithiasis. Eur Urol 2010;9:802-6. doi: 10.1016/j.eursup.2010.11.006.
7. Yanenko E.K., Merinov D.S., Konstantinova O.V., Epishov V.A., Kalinichenko D.N. // Current trends in epidemiology, diagnosis and treatment of urolithiasis. // Experimental and Clinical Urology 2012; 3: 19–24.
8. Davidov M.I., Dremin E.I., Nikonova O.E., Gushchina T.S. // Epidemiology of urolithiasis in the Perm region: results of a 30-year study // Experimental and Clinical Urology 2019; No. 3: pp. 4–10.

METHODS TO IMPROVE THE RESULTS OF COMPLEX TREATMENT OF COMBINED PATHOLOGIES OF THE GASTRIC, DUODENAL AND COLON

УДК [616.33+616.342+616.345]:
616.33-089:616.34-089

Qirxlarova A.S.
Azerbaijan Medical University, Department of Surgical Diseases III, Baku, Azerbaijan

ABOUT THE AUTHORS

Ayten Qirxlarova –
ayten.mv@yandex.com
+994706709404

Abstract

Combined surgical pathology of the abdominal cavity is one of the serious problems of modern surgery. This article analyzes the results of surgical treatment of 110 patients with combined surgical pathology of the abdominal organs. According to the purpose of the study, 2 comparison groups were formed: the control group, where patients underwent phased surgical treatment of combined abdominal pathologies (CAP), and the main group, where patients underwent simultaneous surgery to eliminate CAP. As a result of the study, an algorithm for the diagnosis and treatment of patients with CAP was developed. The proposed algorithm is a reliable guarantee for improving the results of surgical treatment of CAP.

Keywords
combined abdominal pathologies, treatment

Асқазан, онекіелі ішек және тоқ ішектің қосарланған патологиясын кешенді емінің нәтижелерін жақсарту әдістері

Гырхларова А.С.
Азербайджанский Медицинский Университет, Кафедра хирургических болезней III, Баку, Азербайджан

АВТОРЛАР ТУРАЛЫ

Ayten Qirxlarova –
ayten.mv@yandex.com
+994706709404

Аңдатпа

Құрсақ қуысы мүшелерінің жанамалас хирургиялық патологиялары – заманауи хирургиядағы маңызды мәселелердің бірі. Бұл мақалада қосарланған абдоминальды патологиялары (ҚАП) бар 110 науқасты хирургиялық емдеудің нәтижелері талданған. Зерттеу мақсатына сәйкес 2 салыстыру тобы құрылды: ҚАП бойынша кезеңдік хирургиялық емдеуден өтетін науқастардың бақылау тобы, және ҚАП-ты жою бойынша бір мезеттік ота жасалатын науқастардың негізгі тобы. Зерттеу нәтижесінің негізінде ҚАП-ы бар науқастарды емдеу және диагностикалау алгоритмі даярланды. Ұсынылған алгоритм – ҚАП-ты хирургиялық емдеудің нәтижелерін жетілдірудің сенімді кепілі

Түйін сөздер
қосарланған абдоминальды патологиялары, емі

Способы улучшения результатов комплексного лечения сочетанных патологий желудка, 12 перстной кишки и толстого кишечника

ОБ АВТОРАХ

Ayten Qirxlarova –
ayten.mv@yandex.com
+994706709404

Гырхларова А.С.
Азербайджанский Медицинский Университет, Кафедра хирургических болезней III, Баку, Азербайджан

Аннотация

Сочетанные хирургические патологии органов брюшной полости являются одним из серьезных проблем современной хирургии. В данной статье проанализированы результаты хирургического лечения 110 пациентов с сочетанной хирургической патологией органов брюшной полости. Согласно целью исследования, были сформированы 2 группы сравнения: контрольная группа, в которой пациенты подвергались поэтапному хирургическому лечению сочетанных абдоминальных патологий (САП), и основная группа, в которой пациентам проводилась одномоментная операция по устранению САП. В результате исследования был разработан алгоритм диагностики и лечения пациентов с САП. Предложенный алгоритм является надежной гарантией для улучшения результатов хирургического лечения САП.

Ключевые слова
сочетанная абдоминальная патология, лечение

Despite the development and achievements of modern medicine, the results of the treatment of certain pathologies of the digestive system and their combinations are still not satisfactory [2,7]. Diagnosis of any pathology of the abdominal cavity is an important aspect than to consider correct the simultaneous elimination of this problem [4]. The background in which the underlying disease develops and its consequences should be considered an important condition for the development of combined pathologies [4,7]. One of the important points is that changes in one anatomical region of the digestive tract can affect other departments and lead to chronic and protracted pathological changes [2,4]. This leads to a large number of conflicting opinions, if you do not take into account the diagnostic of pathology of the digestive system [5]. The third important condition is that pathological changes found in different areas of the digestive system are not taken into account in determining the simultaneous radical treatment tactics [1,4,6].

The fourth prerequisite is the incorrect and inadequate systematization of the combined pathologies of the digestive system. Timely and objective assessment of the severity of combined abdominal pathologies (CAP) is the basis of treatment tactics [7].

The fifth condition, although individual pathologies are repeated at the same time, their elimination should not be addressed in a separate order, but systematized and treated radically [4].

Finally, the last condition is the use of methods that guarantee radicalization and a guaranteed result in the treatment of each disease with the joint resolution of individual pathologies [3,7].

The above can be considered as urgent problems that are not yet fully reflected in medical sources and are awaiting radical resolution [4.7].

Purpose

Improving the results of treatment of combined abdominal pathologies (CAP) using traditional and new methods, by developing the basics of diagnosis and assessing the severity.

Materials and methods

The study involved 110 patients. Patients were divided into two groups, aged 18 to 70 years. Patients in each group were divided into 3 subgroups. 60 patients of the main group with CAP were purposefully examined, and the elimination of revealed pathologies was carried out in 3 directions; 1) step-by-step surgical treatment; 2) initial surgical operation and further conservative treatment; 3) The simultaneous elimination of CAP by radical operations, that is, CAP in 60 patients of the main group is eliminated by radical treatment.

In the second group, the subgroups were similar.

№	Pathology	Number of patients
1	Gastric diverticulum	8
	Duodenal diverticulum	9
	Colon diverticulum	12
2	Gastric atony	20
	Pyloroduodenal stenosis	6
	Gastroptosis	24
3	Chronic duodenal obstruction	26
	Reflux gastritis	26
	Violations of the biliary system	16
4	Sliding hiatal hernia	22
	Reflux esophagitis	22
5	Megacolon	26
	Transversoptosis	26
	Impaired colonic patency	26

Table 1.
The incidence of postoperative combined abdominal pathologies (CAP).

1. The operation was applied only for one detected pathology in a group of patients where the examination was not performed according to the CAP protocol. Without correction of other pathologies.
2. Patients who, prior to surgery, on the basis of lengthy complaints and studies, confirmed the presence of CAP. In this case, only conservative treatment was possible.
3. Elimination of later detected CAP by radical methods in repeated operations. The results are relative.

Thus, the elimination of CAP in patients of the control group was not radical and complete.

The main research criteria:

1. Identified CAP data;
2. An assessment was made of the feasibility of the operations involved.

It is important to correctly assess the main factors in the development of CAP, to determine their developmental sequence and which pathology is leading. The design of the control group contributed to the correct understanding of the truth during the study. Combined abdominal pathologies are formed by the following diseases.

1. Gastric, duodenal and colon diverticulums
2. Gastric atony and obstruction due to pyloroduodenal stenosis, gastroptosis;
3. Chronic duodenal obstruction, reflux gastritis, pathology of the biliary system;
4. Sliding hiatal hernia and reflux esophagitis;
5. Impaired colon patency due to megacolon and transversoptosis.

These pathologies developed in combination with each other and were diagnosed simultaneously (Fig. 1, 2, 3, 4).

Criteria for choosing treatment methods:

In accordance with the accepted rules, the treatment program plan was selected based on the severity of the detected pathologies. From a surgical point of view, treatment was two ways: 1) conservative treatment; 2) surgical treatment.

During the study, both treatment methods were compared, both methods were used together as needed. This approach will lay the foundation for the practical application of research results by improving the overall treatment outcome in accordance with the purpose of the study.

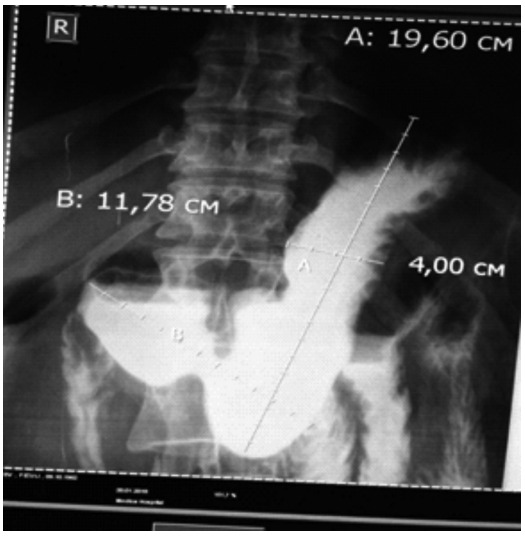


Fig. 1.
Determination of gastric atony.

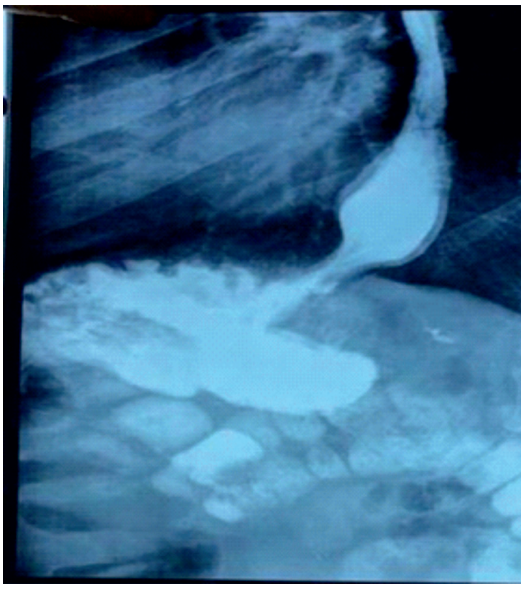


Fig. 2.
X-ray picture of hiatal hernia

Fig. 3.
Gastroptosis and duodenum diverticulum

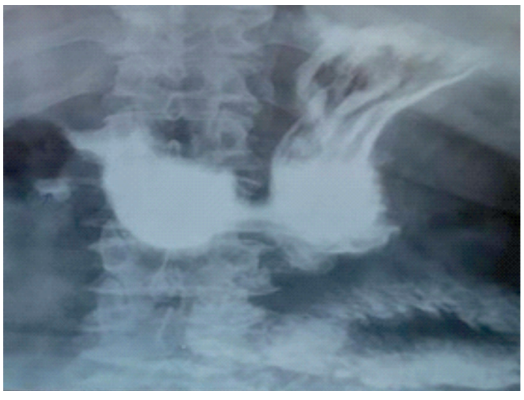


Fig. 4.
Surgical treatment of gastric atony

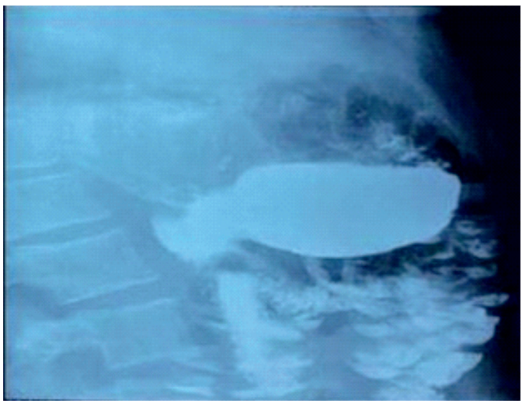
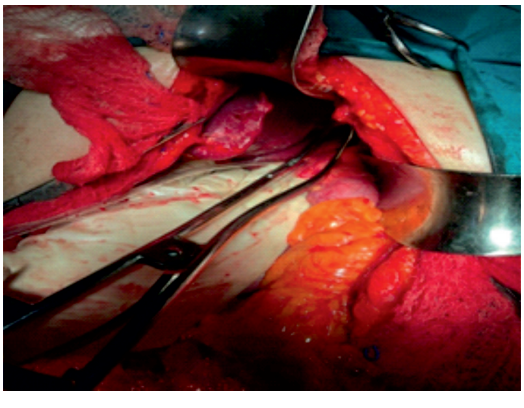
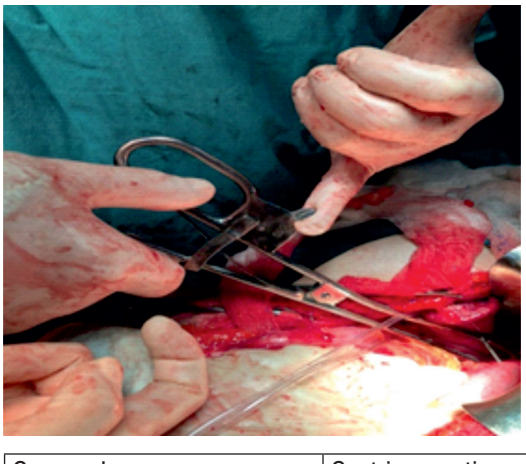


Fig.5, 6
In the surgical treatment of a hernia of the diaphragm, the measurement of the size of the hole and the angle of His using the "Chiatomer"





The conservative and operational treatment tactics used are divided into two groups, both traditional and new methods.

Tasks of traditional methods of conservative treatment

1. Elimination of peristaltic disorders in certain sections of the digestive system;
2. Normalization of high pressure in the digestive tract and abdominal cavity
3. To achieve the elimination of prolonged pathological delay and stagnation in the digestive tract;
4. To achieve the restoration of impaired digestive activity in certain areas of the digestive tract.

We have developed a new method of administering drugs to the digestive system when it is impossible to take drugs and drugs orally (there is a certificate).

Our newly invented and patented surgical methods:

1. A way to eliminate a diverticulum with corrugating seams.
2. The method of surgical treatment of gastric atony;
3. In the surgical treatment of a hernia of the diaphragm, the measurement of the size of the hole and the angle of His using the "Chiatomer" (Fig 5, 6).

A method to eliminate a diverticulum using corrugating seams (Moscow, Eurasian Patent Organization, No. 1600625).

When the diverticulum is located in technically difficult places, the opening of the organ lumen can lead to its further expansion, and when suturing, this can lead to deformation of the organ or to narrowing of its lumen. Sometimes, to avoid the above, a resection of the diverticulum or a larger area of the organ is required. Also, when conducting large operations with combined pathologies of the stomach and duodenum, it is important to eliminate the diverticulum in a simpler and more reliable way in order to avoid extensive operations on two or more organs. In our opinion, the treatment that meets these criteria consists in eliminating the diverticulum with the corrugating seams we have proposed.

Below is the nature and difference from other types of diverticulum elimination operations (A.K. Zemlyanov): they find the gates of the diverticulum and highlight the extreme points of the diverticulum (proximal and distal) in the longitudinal direction. Sutures pass through the serous layer and the

Traditional methods of surgical treatment

Crurorаphy	Gastric resection
Fundoesophagophrenoraphy	Strong operation
Fundoplication	Various types of operations to reduce the volume of the colon (resection, hemi or total colectomy).

muscular-fibrous ring fix the gates of the diverticulum. The threads of the corrugating seams are laid aside, while the bottom and the diverticulum body take the form of wavy layers, the subsequent seams are superimposed in the transverse direction and include both edges of the serous-fibrous ring and pass through the wave-like folds, while the seams are repeated at a distance of 0.5 cm from each other friend until the diverticulum is completely eliminated (Fig 7, 8).

As a result, the diverticulum is completely eliminated with the help of corrugating seams. With a diverticulum of duodenum, small and large intestine, according to our proposed technique, the sutures are performed in the transverse direction, and not in the longitudinal direction.

During the examination, in patients with diverticulum, a sliding hiatal hernia with reflux esophagitis, reflux gastritis, chronic duodenal obstruction, chronic constipation, visceroptosis, gallstone disease and chronic pancreatitis were found in combination. The results show that increased pressure within the stomach of the duodenum can lead to the development of a hiatal hernia, reflux esophagitis and gastritis. If we take into account the dependence of the motor function of the duodenum, small and large intestine on the center located in the muscle layer of the descending part of the duodenum, then we can give an explanation of the mechanism of congestive disorders of intestinal motor activity in diverticula. In addition, motor disorders cause atrophy in the muscle layer, and then a defect that forms the gate of the diverticulum. After the diverticulum is eliminated with a corrugating suture during the examination of the suture area from the mucous membrane after opening the lumen of the resected part of the colon, a complete restoration of the diverticulum gate region is revealed and this area does not differ from the surrounding tissues.

When X-ray contrast research and endoscopy after 3, 6, 12, 24 and 36 months after the proposed surgical procedure in all cases, the normal appearance of the mucous membrane was obtained at the site of the operation. No diverticulums or other deviations, i.e. pathological changes were found.

The generally accepted classification of the diverticulum does not fully reflect its location in individual

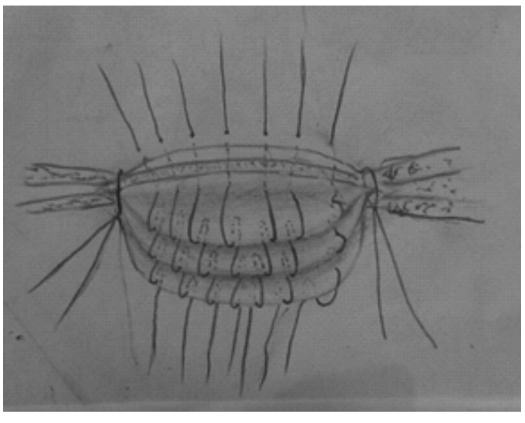


Fig. 7
Description in text

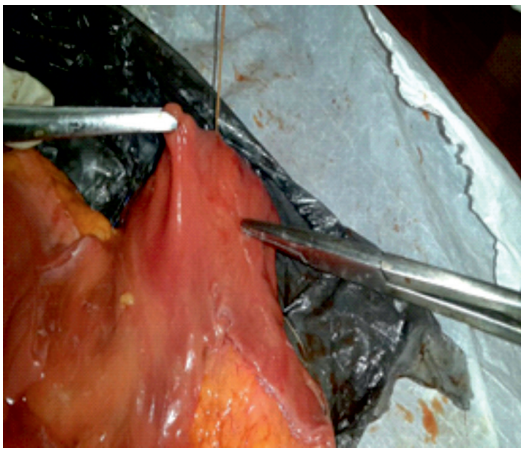


Fig. 8
Description in text

organs, the possibility of the technical implementation of surgical treatment methods, and the prevention of various complications after surgery. Therefore, we tried to develop a new classification, which reflects the location of the diverticulum in the gastrointestinal tract, the condition of other pathologies of the digestive tract, the success of the planned operation and the possibility of avoiding complications.

Thus, based on the above conditions, during the study of diverticulums, we focused our studies in this direction. The essence of our proposed method for the surgical treatment of gastric atony (Eurasian Patent Organization No. 030786) is as follows:

A method of surgical treatment of gastric atony with gastroptosis is to hem the loop of the small intestine to the stomach so that intestinal motility is transmitted to the muscles of the stomach.

Next, an anastomosis is formed between the stomach and small intestine to accelerate the

In relation to the peritoneum – Intraperitoneum; – Extraperitoneum.	**Due to the complexity of the anatomical location** – located in the free zone of the body – border with other organs or surrounded by numerous vessels
Features of the diverticulum gate – The gates and neck of the diverticulum are clearly defined; – The gates and neck of the diverticulum are not detected, i.e. isolated diverticulum	**Types of surgical correction:** – resection of an organ with a diverticulum; – elimination of the diverticulum according to the method of Zemlyanov – a new method that we offer is to eliminate the diverticulum with corrugating seams without opening the lumen

evacuation of food masses from the stomach to the small intestine, followed by plugging of the distal end, which is led to the zone of the esophageal-gastric transition. In this case, the distal part of the small intestine runs along the lesser curvature of the stomach. Fixation of the distal end in this position is carried out by applying gray-serous sutures. After that, an «end-to-side» anastomosis is performed between the proximal end of the small intestine and the lateral surface of the distal part. At the same time, small intestine resection is carried out at a distance of 20-30 cm from Treitz, the distal part of the intestine is fixed in a position in which the mesentery is located laterally, the free edge is medially. When fixing the distal part of the intestine, the mesentery is fixed to the small omentum.

The essence of the invention lies in the fact that the proposed method for the treatment of atony with gastroptosis, maintains a normally functioning pulp with the restoration of the motor function of the stomach itself. In general, operations to eliminate gastric atony are performed simultaneously with operations on the large intestine and other organs. At the same time, surgical tactics take place with combined pathologies of the gastric, duodenum, colon, and other organs in the abdomen.

The location of the distal part of the small intestine with the plugged end along the lesser curvature of the stomach and its subsequent fixation in this position on the surface of the stomach and the application of gastroenteroanastomosis allow for a rhythmic effect on the wall of the stomach, which leads to the activation of its work and ensures the evacuation of food masses into the small intestine while maintaining sphincter.

Dissection of the small intestine at a distance of 20-30 cm from Treits provides the possibility of the normal execution of the «end-to-side» anastomosis to create better patency of the food masses.

Fixing the distal part of the intestine in a position in which the mesentery is located laterally, the free edge is medially, excludes infringement of the mesentery and the formation of an inflection of the small intestine, while ensuring normal transmission of contractile impulses and synchronization of peristalsis of the stomach and intestines.

Stitching of the vessels of the mesentery and small omentum provides the best conditions for normal blood flow in the vascular arch and nutrition of the distal part of the small intestine, its normal engraftment and functioning after surgery.

The invention is illustrated in the following figure

Fig. 9 shows the final view of the operation with the imposition of gastroenteroanastomosis and hemicolectomy.

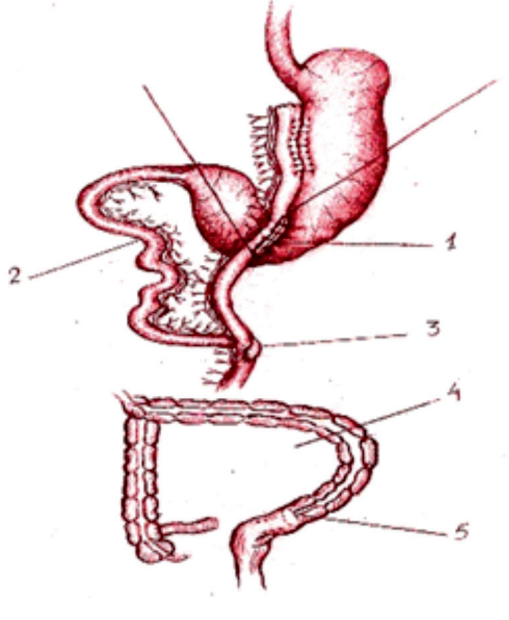


Fig. 9.
1. Anastomosis between the loop of the small intestine and the anterior wall of the stomach.
2. The initial part of the small intestine;
3. Anastomosis «end to side» between the proximal loop and small intestine;
4. The remainder of the large intestine;
5. Anastomosis between parts of the large intestine.

Results and discussion

In the first subgroup of the main group 20 patients underwent phased surgical treatment. Although CAP was found during x-ray examination of the stomach and irrigography, during surgery, 10 patients were diagnosed with prolapse of the stomach, with a relatively preserved tone of the stomach. In addition, these patients were under the age of 20 years. Therefore, they had an intervention to reduce the enlarged colon (resection, hemicolectomy). The stomach was mobilized from the transverse colon and omentum. Fundoplication (2 patients) and anterior cruroraphy and fundoesophagophrenoraphy (4 patients) were performed in 6 patients out of 10 of this subgroup due to a sliding hernia of the esophageal opening of the diaphragm.

Subsequent examinations of patients showed no signs of CAP.

In the remaining 10 patients of the 1st subgroup, which initially had surgery on the colon, the diagnosis of visceroptosis was established. These patients were between 20 and 30 years old. They categorically refused additional surgery on the stomach. During a postoperative examination of patients, their stomach sizes not only decreased, but also increased; preexisting cardiac insufficiency of the stomach led to a pronounced sliding hernia of the esophageal opening of the diaphragm and reflux esophagitis. An increase in patients complaints led to the need for repeated operations - gastric resection with the Hoffmeister-Finsterre modification and fundoplication (4 patients) according to the Shalimov method and fundoesophagophrenoraphy with anterior cruroraphy. These patients recovered well after reoperation, and reexamination confirmed this.

The remaining 20 patients in the main group had only one - colon correction surgery in the above options. In the postoperative period, patients had

gastric atony, chronic duodenal obstruction, reflux gastritis, reflux esophagitis, and therefore they were prescribed conservative treatment. The relatively mild course of these pathologies, the compliance with conservative treatment, and the patient's aversion to surgery substantiated prolonged conservative treatment and a relative improvement in the general condition.

All 20 patients in subgroup III of the main group underwent screening according to the protocol, CAP was confirmed and a simultaneous correction of each pathology was planned. 7 out of 20 patients had a hiatal hernia, cholelithiasis, diverticulum of the colon and duodenal, chronic duodenal obstruction. These patients underwent anterior crurography with fundoesophagophrenoraphy, diverticulum elimination with corrugating sutures according to our patented method, cholecystectomy and Strong's operation. Surveys at different times prove that surgical results are good.

In 13 out of 20 patients, a sliding hiatal hernia, gastroptosis with atony, chronic duodenal obstruction and diverticulum (2 cases), gallstone disease (7 cases) and visceroptosis and lengthening of the left half of the colon were found. CAP correction was performed during the same surgical procedure for these patients. Along with anterior crurography and fundoesophagophrenoraphy, cholecystectomy, the elimination of the diverticulum with corrugating sutures according to our patented method, the elimination of atony of the stomach according to our patented method, Strong's operation, left-sided hemicolectomy were performed. After the operation, patients felt very good and had no complaints. Analysis carried out at different times proved this (Fig. 2, 3, 4).

Of the 50 patients in group II, 18 had not previously been examined for CAP. They underwent surgery for any of the diseases discovered in them (cholecystitis - 8, hiatal hernia - 5, dolichosigma - 5 patients). Since these complaints continued to persist in these patients for 3-5 years, a protocol examination was conducted, and it was established that they had CAP from an early period. The results of the operation were unsatisfactory due to the fact that other diseases that make up the CAP were not detected in a timely manner and proper correction procedures were not performed. Twelve of these patients underwent surgery, and 6 patients chose non-surgical treatment. The performed operations were selected in accordance with the pathology found and performed in the same way as in the main group. Of 12 patients, 10 were rated as good, and 2 had a relatively good result.

Although it was believed that in 16 patients of a different subgroup, CAP was not detected before and during surgery, only one operation was performed. The following pathologies remained hidden in these patients: chronic duodenal obstruction (8 patients), sliding hiatal hernia (8 patients). In this group of patients, for various reasons (pyloroduodenal stenosis, peptic ulcer), only the Hoffmeister-Finsterere resection was performed. Complaints and persistent postoperative complications led to further screening of patient protocols. We used conservative treatments as requested by patients and were able to achieve relative symptom relief.

Examination of the following 16 patients from the second group of patients who had previously undergone abdominal pathology revealed that the CAP, which was originally, still remains. Nissen fundoplication was performed in 8 patients from this group due to a sliding hiatal hernia. Existing visceroptosis, chronic duodenal obstruction were overlooked. During the second operation, these patients underwent Strong's surgery, Bilrot II gastric resection, and left-sided hemicolectomy. Even after these procedures, the test results were good, but some patients continued to complain.

Thus, the study of ways to improve the results of treatment of combined abdominal pathologies (CAP) shows that in the case of chronic diseases of the abdominal cavity, not only one organ should be evaluated, but targeted steps should be taken and a correct assessment of the condition of other organs should be carried out. Only a comprehensive and radical treatment of the detected SAP in time can be considered as a guarantee of good treatment results.

Based on our research, we have created an algorithm for diagnosis and treatment:

Conclusion

1. A comprehensive instrumental study based on ongoing complaints will help identify CAP.

2. Chronic and numerous complaints from the organs of the gastrointestinal tract require the determination of CAP.

3. Studies on CAP should be carried out according to the protocol.

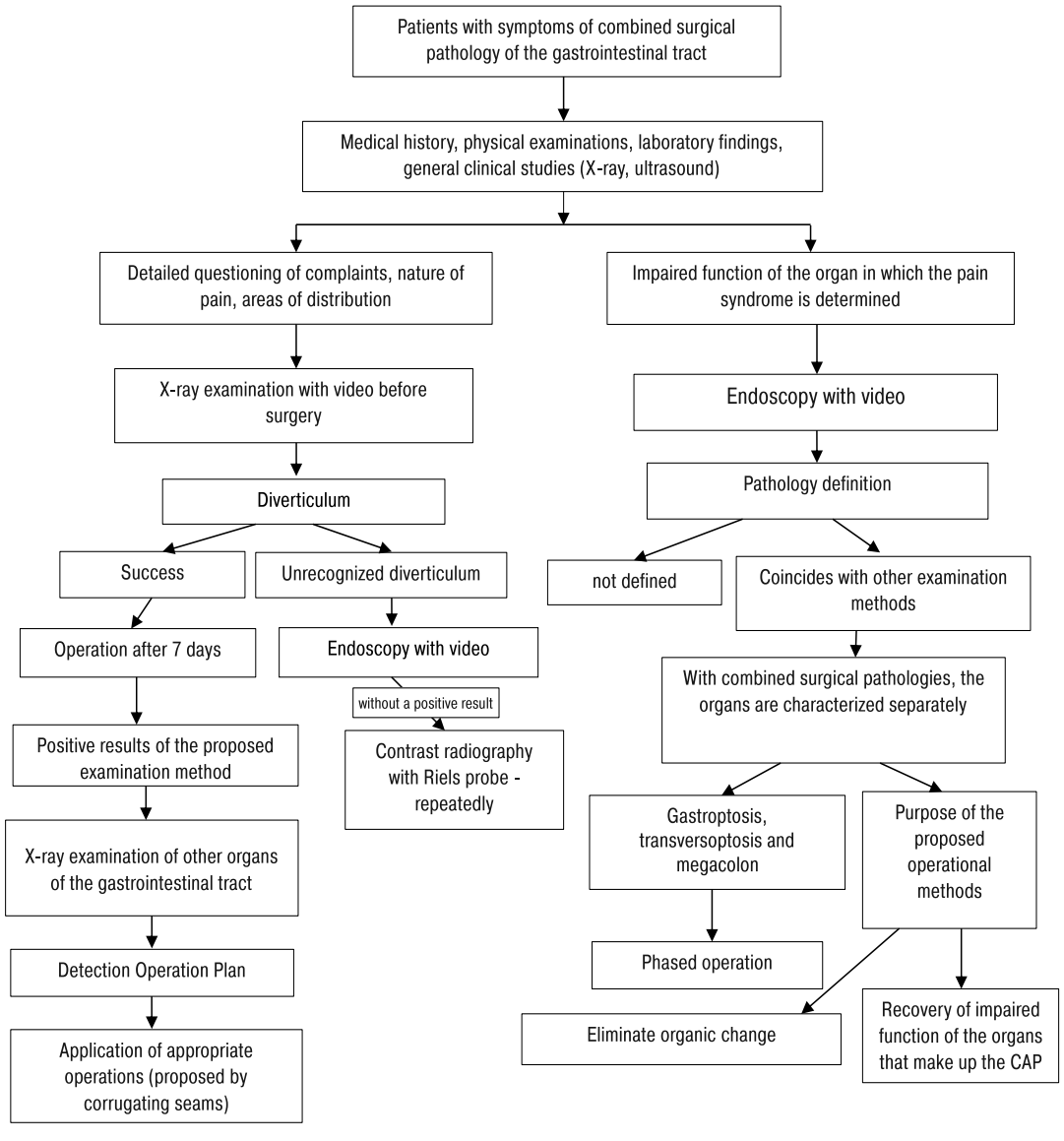
4. The scheduling algorithm determines the scope of research, treatment program and types of surgical methods.

5. Surgical treatment of the diverticulum - the elimination of the diverticulum with the help of corrugating seams should be at the disposal of practicing doctors.

6. The treatment of prolapse and atony of the stomach by the surgical method we have proposed can be offered as a reliable, simple and easy procedure to perform and is possible in combination with other operations.

7. Our proposed program is a reliable guarantee for improving the results of the treatment of CAP.

Fig. 10
Algorithm for treatment and diagnostic of combined surgical pathologies of the gastrointestinal tract



References

1. N.A. Stassen, J.K. Lucan, M.S. Dixon et al. Abdominal compartment syndrome // Scand. J. Surg. - 2002. - No. 91. - P. 104-108.
2. V. Makhovsky. Simultaneous combined operations in emergency and elective surgery // Surgery. - 2002. - No. 6. - P. 46.
3. T. Murphy, R.H. Hunt, M. Fried, et al. Diverticular disease. WGO Practice Guidelines, http://www.worldgastroenterology.org/UserFiles/file/guidelines/diverticular-disease-english-2007.pdf (2007, accessed 24 April 2018).
4. K.N. Salamov. Features of diverticular colon disease and the outcome of rehabilitation treatment // Problems of proctology. - Moscow, 2005. - P. 55 - 58.
5. V. D. Fedorov. Medium and heavy simultaneous combined operations // Surgery. - 1993. - No. 3. - P. 3-6.
6. M.V. Repin. Diagnosis and surgical correction of functional disorders in patients with a resected stomach // Perm Medical Journal. - 2004. - No. 4. - P. 105-109.
7. A.V. Tobokhov. Diagnosis and surgical treatment of visceroptosis // the Dissertation of the doctor of medical sciences. - Moscow. - 2003. - 213 pages.

THE USE OF THE METHOD OF RETROGRADE PYELOLITHOTRIPSY WITH KIDNEY STONES

УДК 616.613-0.89

Mami D.E.[1,2], Malikh M.A.[2], Sengirbaev D.I.[1], Asoev R.R.[2]
[1]NJSC "National Medical University named after S.D. Asfendiyarov"
[2]JSC "Scientific Center of Urology named after B.U. Dzharbusynov", Almaty, Kazakhstan

Abstract

The article provides a brief review of the literature on the effectiveness of the method of intrarenal surgery - retrograde pyelolithotripsy (RPT) in urolithiasis. The method has been actively introduced since 2005 with the development of flexible ureteroscopes. In our center, the method has been introduced since 2015. There is a sufficient number of studies on the use of retrograde pyelolithotripsy with kidney stones more than 2 cm, the effectiveness, minimally invasiveness and safety of this method have been proved so far. There are few studies to study the possibilities of using RPT for staghorn calculi and multiple stones, which confirms the relevance of research in this direction. The purpose of this work is to analyze literature data on the topic of intrarenal surgery for staghorn and multiple stones. ***Methods:*** *We conducted a systematic search of literature data and selected sources from the Cochrane database, MEDLINE, PubMed, EMBASE, Google Scholar, as well as research works and online educational publications in Russian. Twenty works were included that met inclusion criteria.* ***Results:*** *The review article describes the method of surgical treatment of patients with kidney stones, indications and contraindications. Evaluation of the effectiveness of the method is assessed by the complete release of the cavity system from concernments (stone-free rate).* ***Conclusion:*** *Thereby, the problem of the study of RPT and its effectiveness in the treatment of nephrolithiasis is undoubtedly relevant and requires further study. RPT is a good method of choice, with anatomical difficult accesses, with obesity and prolonged use of anticoagulants. But this is a relatively effective method in the treatment of patients with staghorn stones, and is the method of choice for a certain contingent of patients in whom the formation of percutaneous access to the stone is impossible or is associated with a high risk of complications.*

ABOUT THE AUTHORS

Mami Darkhan Erlanuly *- a resident mentor at the Department of Urology of the NJSC "National Medical University named after S.D. Asfendiyarov", doctor in Department of urolithiasis and Endourology, JSC "Scientific Center of Urology named after B.U. Dzharbusynov". Darhan.md@gmail.com, +77017107374*

Malikh Mohammad Aref *- Head of the Department of ICD and Endourology of the JSC "Scientific Center of Urology named after B.U. Dzharbusynov", MD, professor.*

Sengirbaev Daurenbek Isakovich *- Professor of the Department of Urology of the NJSC "National Medical University named after S.D. Asfendiyarov", Ph.D.*

Asoev Rasuldzhon Rakhimovich *– doctor in Department of urolithiasis and Endourology, JSC "Scientific Center of Urology named after B.U. Dzharbusynov".*

Keywords
urolithiasis, staghorn calculus, RPT

Ретроградтық пиололитотрипсия әдісін бүйрек тастарына қолдану

Мәми Д.Е.[1,2], Малих М.А.[2], Сенгирбаев Д.И.[1], Асоев Р.Р.[2]
[1]НАО «Национальный медицинский университет, им. С.Д. Асфендиярова»
[2]АО «Научный центр урологии им. Б.У. Джарбусынова», Алматы, Қазақстан

Аңдатпа

Мақалада несеп-тас ауруы (НТА) кезінде қысқаша интрареналды хирургия - ретроградтық пиололитотрипсия әдісінің тиімділігі туралы әдеби шолу ұсынылған. Бұл әдіс икемді уретероскоптарды жасаумен 2005 жылдан бастап белсенді енгізілуде. Біздің орталықта әдіс 2015 жылдан бастап енгізілген. Бүгінгі күні 2 см-ден асатын бүйрек тастарына ретроградтық пиололитотрипсия әдісі қолдану бойынша зерттеулер жеткілікті, бұл әдістің тиімділігі, кіші инвазивтілігі және қауіпсіздігі дәлелденді. Осы әдісті маржан тәрізді тастарға және бүйректе бөрнеше тастар кезінде қолдану бойынша зерттеулер аз, сондықтан осы бағыттағы зерттеулердің өзектілігін растайды. Бұл жұмыстың мақсаты маржан тәрізді тастарға және бүйректегі бірнеше тастарға арналған интрареналды хирургия тақырыбындағы әдебиеттерге талдау жасау. ***Әдіс:*** *Біз Кокрейн, MEDLINE, PubMed, EMBASE, Google Scholar, әдеби деректердің жүйелі іздеу өткізіп және дереккөздерді таңдап, сонымен бірге орыс тіліндегі зерттеу жұмыстарды және оқу онлайн-басылымдары қосылған. Қосу критерийлеріне жауап беретін жиырма құжат енгізілді.* ***Нәтижелері:*** *Шолу мақалада бүйректерінде тастары бар науқастарды ота емдеудің заманауи әдісі, көрсеткіші мен қарсы көрсетілімдері. Әдістің тиімділігін бағалау қуыс жүйесін тастардан толық босатумен бағаланады (stone-free rate).* ***Қорытынды:*** *Осылайша, РПТ зерттеу мәселесі және оның нефролитиазды емдеудегі тиімділігі сөзсіз өзекті және одан әрі зерттеуді қажет етеді. РПТ - анатомиялық қиын қол жетімділіксіз кезде, семіздікпен және антикоагулянттарды ұзақ қолданылғанда таңдаудың жақсы әдісі. Бірақ маржан тәрізді тастар кезінде салыстырмалы түрде тиімді әдіс және белгілі науқастарда перкутандық қол жетімділігін қалыптастыру мүмкін емес немесе асқыну қаупі жоғаруына байланысты таңдау әдісі болып табылады.*

АВТОРЛАР ТУРАЛЫ

Мәми Дархан Ерланұлы *– наставник резидентов на кафедре урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова». Darhan.md@gmail.com, +77017107374*

Малих Мохаммад Ареф *– заведующий отделением МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова», д.м.н., профессор.*

Сенгирбаев Дауренбек Исакович *– профессор кафедры урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», к.м.н.*

Асоев Расулджон Рахимович *– врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова»*

Түйін сөздер
НТА, маржан тәрізді тас, РПТ

Применение метода ретроградной пиелолитотрипсии при конкрементах почек

ОБ АВТОРАХ

Мэми Дархан Ерланулы – *наставник резидентов на кафедре урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова». Darhan.md@gmail.com, +77017107374*

Малих Мохаммад Ареф – *заведующий отделением МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова», д.м.н., профессор.*

Сенгирбаев Дауренбек Исакович – *профессор кафедры урологии НАО «Национального медицинского университета, им. С.Д. Асфендиярова», к.м.н.*

Асоев Расулджон Рахимович – *врач отделения МКБ и эндоурологии АО «Научного центра урологии им. Б.У. Джарбусынова»*

Ключевые слова
МКБ, коралловидный конкремент, РПТ

Мэми Д.Е.[1,2], Малих М.А.[2], Сенгирбаев Д.И.[1], Асоев Р.Р.[2]
[1]НАО «Национальный медицинский университет, им. С.Д. Асфендиярова»
[2]АО «Научный центр урологии им. Б.У. Джарбусынова», Алматы, Казахстан

Аннотация

Врожденный синдром удлиненного интервала QT (СУИQT) характеризуется аномально продолжительной реполяризацией желудочков из-за наследственных дефектов в натриевых и калиевых каналах сердца, которые предрасполагают пациентов к синкопальным состояниям, желудочковым аритмиям и внезапной сердечной смерти. Ранняя диагностика и профилактическое лечение играют важную роль в предотвращении внезапной сердечной смерти у пациентов с врожденным СУИQT. Диагностические критерии врожденного СУИQT основаны на определенных электрокардиографических данных, клинических данных и результатах теста на адреналин. Недавно также был описан специфический для генотипа электрокардиографический паттерн врожденной СУИQT. Недавние исследования предполагают выполнимость генотип-специфического лечения СУИQT, и в ближайшем будущем специфичное для мутаций лечение, вероятно, станет новым подходом к этому потенциально смертельному синдрому. Мы представляем клинический случай, который подтверждается электрокардиографическими и клиническими диагностическими критериями, свидетельствующий о синдроме удлиненного QT. В данном случае, пациентке был имплантирован кардиовертер-дефибриллятор для вторичной профилактики внезапной сердечной смерти. У пациентки возникают приступы внезапного сердцебиения с обмороками, и имплантированный дефибриллятор проводит спасительную терапию от жизенугрожающей желудочковой тахикардии.

Relevance

Urolithiasis is the most common urological disease that affects people of both sexes at any age, diagnosed an average of not less than 1-3% of the population, and most often in people of working age 20-50 years. Currently, in different countries of the world, out of 10 million people, 400 thousand observe urolithiasis. Annually 85 thousand diseases of the urolithiasis are recorded. The guidelines and clinical recommendations of the European Association of Urology for the treatment of urolithiasis are reviewed annually, however, over the past decade, percutaneous nephrolithotripsy (PCNL) and remote shock wave lithotripsy (ESWL) are the most recommended methods for minimally invasive surgery of kidney stones. ESWL is the "gold" standard for the treatment of calculi less than 2 cm and according to some authors, its percentage of effectiveness reaches 90% [1]. However, the effectiveness of ESWL depends on many factors: the size, density and localization of calculus. Due to the fact that residual calculi are diagnosed in 54% of cases after ESWL, this method is not applicable for stones sizes greater than 2 cm. Egilmez T. et al. in their study found that the effectiveness of ESWL with stones over 1.5 cm is from 45-60% [2]. Albala D. et al. indicate that the efficiency of ESWL with the localization of calculus in the lower calyxes is about 37-50% [3]. PCNL has the highest efficiency in the treatment of calculi over 2 cm, including staghorn calculus. According to Singla M. et al. (2008), the effectiveness of PCNL with staghorn stones is from 74 to 83% [4]. Preminger G. (2005) and Michel M. (2007) indicate that the effectiveness of this treatment is from 78 - 95%. However, it has been reliably proven that PCNL is associated with the risk of complications such as bleeding, urosepsis, embolization [5, 6]. An alternative approach to the treatment of urolithiasis, which reduces the risk of complications, is transurethral access to the pyelocaliceal system, i.e. retrograde pyelolithotripsy. This method is characterized by less trauma and a lower frequency of complications. In recent years, in connection with the development of technical capabilities to ensure effective disintegration of calculi, constant access to the kidney through the ureter, good endoscopic imaging and miniaturization of instruments, this method has been widely used, and the attention of endourologists has focused on studying the effectiveness and improving the technique of retrograde intrarenal surgery in the treatment of single large and staghorn stones. According to the authors, indications for retrograde pyelolithotripsy with staghorn stones are the presence of a patient's blood coagulation system disease, aggravated somatic history, overweight, lack of dilatation of the pyelocaliceal system, renal and upper urinary

tract abnormalities that do not allow or significantly impede PCNL [7].

Huffman first described this technique in 1983, after using a rigid ureteroscope and ultrasonic lithotripter, he crushed a large calculus in the pelvis. Since 2002, retrograde pyelolithotripsy has become widely used in the treatment of small kidney stones and the upper third of the ureter. The results of studies in Europe and the United States showed that the effectiveness of the method reaches 90–93%. Since 2008, research has begun on the possibilities of using retrograde pyelolithotripsy in the treatment of large and staghorn stones. [8].

To date, in the literature there are studies on the effectiveness of RPT, including in a comparative aspect with other minimally invasive methods of treating urolithiasis. The development of new technologies has led to the miniaturization of the endoscopic instrument and improved visualization, which allowed to expand indications for retrograde intrarenal surgery (RIRS). [9] In 1990 Fuchs A. with co-authors published the first try of observation of 208 patients, who had the removal of kidney stones by using retrograde ureteropyeloscopy [10].

In 1998 Grasso M. with co-authors [11], showed effectiveness and safety of RIRS methods by using flexible ureteroscope with a diameter 9 Ch and laser lithotripter for the treatment of patients with a stones in their kidneys and the over 2 sm upper part of ureter, who had concomitant diseases that do not allow PCNL. At the same time, the authors managed to achieve complete removal of the stone in 93% and 100% of cases with localization of the stone in the kidney and upper third of the ureter, respectively. According to some authors, a flexible ureteroscope, due to certain technical features, along the upper urinary tract is not always possible without increasing the risk of damage to both the instrument itself and the ureter wall [12, 13].

The results of using RPT by foreign researchers are still contradictory. So Perlmutter et al. when studying the effectiveness of RPT of kidney stones up to 2 m in size of different localization, it indicates 100% efficiency of the method for calculi of the upper groups of calyx, 95.8% of effectiveness for localization of stones in the middle groups of calyx and 90.9% of efficiency for calculi of the lower calyx of kidneys. Also, the authors concluded that the localization of calculus does not affect the effectiveness of RPT and the percentage of liberation from calculi [14]. In contrast, a study by Pearle et al. argue that the effectiveness of RPT is 50% and does not have statistically significant advantages over ESWL in crushing stones of the lower groups of kidney cups up to 1 cm in size [15]. Breda et al. in their study demonstrated the effectiveness of RPT in multiple unilateral kidney stones: after 1 session, the percentage of kidney cleansing from stones was 64.7%, after 2 sessions - 92.2% [16]. In 2010, Korean scientists published the results of an analysis of the effectiveness of RPT and the factors affecting it. The study included 66 patients. The average size of stones was 16.8 mm. In 25 patients, more than 2 kidney stones were diagnosed. In 18 patients, the stones were localized in the upper or middle group of calyx, in 48 in the lower groups. 32 patients underwent RPT due to the inefficiency of ESWL, 4 patients previously underwent PCNL. The effectiveness of RPT in this study was 69.7%, and after 1 month it increased to 72.7%. In 13 patients, RPT was ineffective. Scientists conducted a one-factor analysis of factors that influenced the effectiveness of RPT. It was found that important factors were the size of the calculus (common with multiple stones), localization, as well as the primacy of the operation. So, it was reliably proved that the effectiveness of RPT with stones with a total area of less than 15 mm was 83.7%, while with large sizes - 29.4%. With localization of calculi in the upper groups of calyx, the effectiveness of RPT was 94.4%, with localization of only the lower calyx 73.3%, and with the location of multiple calculi in different groups of calyx, the effectiveness of RPT decreased to 38.9%. The effectiveness of RPT was also evaluated depending on the primary operation. So, in patients who underwent RPT as the first therapy, the effectiveness of the method was 83.3%, in patients who underwent RPT after unsuccessful ESWL and PCNL sessions, 58.3% [17]. In 2012, a group of Chinese scientists investigated the effectiveness of using RPT for staghorn stones in patients with a single kidney. Staghorn calculus in patients with a single kidney are the most dangerous clinical cases in the practice of urologists. The potential risk of complications increases by 2-3 times with any surgical or minimally invasive intervention. The study involved 20 patients. The average size of the calculus was 10 mm. All patients had concomitant diseases, in addition, all were overweight. 5 patients previously underwent surgery, in 10 patients a nephrectomy was performed for the same reason (staghorn calculus). The average age of the patients was 52.7 years. The operation consisted of two stages, however, they were carried out simultaneously by two medical teams. The first team conducted PCNL, the second - RPT. The average surgery time was 154 minutes. Postoperative complications were observed in 5 patients. Complete release of the kidney from calculi was observed in 95%. In 1 patient, a residual calculus was found in the lower calyx (less than 6 mm), after 1 month in another patient, a recurrent calculus of up to 4 mm was detected. In conclusion, the authors point to the

need for a combined minimally invasive surgical approach and the important role of RPT in the most difficult clinical situations [18]. In 2013, a group of Turkish scientists published the results of a comparative analysis of the effectiveness of surgical methods such as laparoscopic ureterotomy, ESWL and retrograde intrarenal surgery. The average size of stones was 13.5 mm. The stones were localized in the pelvis-ureteric segment and the proximal ureter. 51 patients underwent laparoscopic calculus extraction, 52 ESWL, 48 RPT. Full extraction of calculus (stone-free rate) was achieved in 92%, 81% and 79%, respectively [19]. The lowest percentage of complications was observed in the group of patients who underwent retrograde pyelolithotripsy using a flexible ureteroscope. Despite the fact that ESWL is the most optimal and recommended method for the treatment of kidney stones, the authors indicate that this method has significant drawbacks - the formation of stone paths, inflammatory processes, the migration of small fragments into the lower cups, residual calculi, which require repeated sessions. Yuruk E. et al. proved that morphological changes in the kidney parenchyma after the shock wave are also present in the distant period, and with multiple sessions can cause fibrosis. Therefore, the ESWL method cannot be considered non-invasive [20]. Despite a sufficient number of studies, a number of issues related to RPT are still open. First of all, this is due to the small number of patients, as well as the lack of studying the long-term consequences. Clear indications and contraindications to this method have not been determined, however, many authors have described RPT as a safe and effective method of surgical minimally invasive treatment of kidney stones. The results of studies on the use of RPT for staghorn and multiple calculus of the upper urinary tract are quite contradictory.

Results

The review article describes the method of surgical treatment of patients with kidney stones, indications and contraindications. Evaluation of the effectiveness of the method was assessed by the complete release of the cavity system from stones (free-stone rate).

Conclusion

Thereby, the problem of the study of RPT and its effectiveness in the treatment of nephrolithiasis is undoubtedly relevant and requires further study. RPT is a good method of choice, with anatomical difficult accesses, with obesity and prolonged use of anticoagulants. But this is a relatively effective method in the treatment of patients with staghorn stones, and is the method of choice for a certain contingent of patients in whom the formation of percutaneous access to the stone is impossible or is associated with a high risk of complications.

References

1. C. Türk (Chair), A. Neisius, A. Petrik, C. Seitz, A. Skolarikos, K. Thomas. EAU guidelines on urolithiasis. 2018 update.
2. Egilmez T, Tekin M.I, Gonen M, Kilinc F, Goren R, Ozkardes H. Efficacy and safety of a new generation shockwave lithotripsy machine in the treatment of single renal or ureteral stones: experience with 2670 patients. // J Endourol. 2007. - № 21. – pp. 23-27.
3. Albala D.M, Assimos D.G, Clayman R.V et al. Lower pole: a prospective randomized trial of extracorporeal shock wave lithotripsy and percutaneous nephrolithotomy for lower pole nephrolithiasis - initial results. // J Urol. – 2001. - № 166. pp. 2072-2080.
4. Singla M, Srivastava A, Kapoor R, Gupta N, Ansari M.S et al. Aggressive approach to staghorn calculi-safety and efficacy of multiple tracts percutaneous nephrolithotomy // Urology. – 2008. - № 71. – pp. 1039-1042.
5. Preminger G.M, Assimos D.G, Lingeman J.E, Nakada S.Y, Pearle M.S, Wolf J.S Jr. Chapter 1: AUA guideline on management of staghorn calculi: diagnosis and treatment recommendations // J Urol. - 2005. – № 173. – pp.1991-2000.
6. Michel M.S, Trojan L, Rassweiler J.J. Complications in percutaneous nephrolithotomy // Eur Urol. – 2007. - № 51. – pp. 899-906.
7. Amosov N.A., Urenkov S.B., Ivanov A.E., Podoynitsyn A.A. The place of retrograde nephrolithotripsy in the treatment of patients with coral nephrolithiasis // Experimental and Clinical Urology // 2015 - No. 4, pp. 100-103.
8. Malikh M.A. Ureteroscopy in the treatment of kidney stones. // Medical newspaper Health of Kazakhstan // No. 8 (39) August 2015, pp. 68-69.
9. Chernyshev I.V., Merinov D.S., Epishov V.A., Pavlov D.A., Fatikhov R.R. The possibilities of retrograde intrarenal surgery in the treatment of large and coral kidney stones // Experimental and Clinical Urology // 2012 - No. 4, pp. 67-73.
10. Fuchs A, Fuchs G. Retrograde intrarenal surgery for calculus disease: new minimally invasive treatment approach.// J Endourol. 1990. Vol. 4. P. 337-345.
11. Grasso M, Conlin M, Bagley D. Reterograde ureteropyiloscopic treatment of 2 cm or greater upper urinary tract and minor stagnhorn calculi. // J Urol. 1998. Vol.160. P. 346-351.
12. Merinov D.S. Possibilities of transurethral interventions in the treatment of large and coral kidney stones. // Urology today. 2011 N 1 (11) 11s.
13. Mahajan PM, Padhye AS, Bhave AA, Sovani YB, Kshirsagar YB. Bapat SS. Is stenting required before retrograde intrarenal surgery with access sheath In-

dian. // J Urol. 2009. Vol. 25, N 3. P. 326-328.
14. Perlmutter A.E, Talug C, Tarry W.F, Zaslau S, Mohseni H, Kandzari S.J. Impact of stone location on success rates of endoscopic lithotripsy for nephrolithiasis // Urology. – 2008. - № 71. – pp. 214-217.
15. Pearle M.S, Lingeman J.E, Leveillee R, Kuo R, Preminger G.M, Nadler R.B, et al. Prospective, randomized trial comparing shockwave lithotripsy and ureteroscopy for lower pole caliceal calculi 1 cm or less // J Urol. – 2005. - № 173. – pp. 2005-2009.
16. Breda A, Ogunyemi O, Leppert J.T, Schulam P.G. Flexible ureteroscopy and laser lithotripsy for multiple unilateral intrarenal stones // Eur Urol. - 2009. - № 55. – pp. 1190-1196.
17. Lim S. H., Jeong B., Seo Seong I.l et al. Treatment Outcomes of Retrograde Intrarenal Surgery for Renal Stones and Predictive Factors of Stone - Free // Korean J Urol. – 2010. - № 51. – pp.777-782.
18. Lai D, He Y, Dai Y, Li X. Combined Minimally Invasive Percutaneous Nephrolithotomy and Retrograde Intrarenal Surgery for Staghorn Calculi in Patients with Solitary Kidney // PLoS ONE. – 2012. - Issue 7(10): e48435.
19. Ozturk U., Şener N.C., Goksel Goktug H.N., et al. The comparison of laparoscopy, shock wave lithotripsy and retrograde intrarenal surgery for large proximal ureteral stones // Can Urol Assoc J. - 2013. - № 7(11-12). – pp.673-676
20. Yuruk E, Binbay M, Sari E, et al. A prospective, randomized trial of management for asymptomatic lower pole calculi // J Urol. – 2010. - №183. – pp.1424-1428.

УДК 616.12-007-0.53.1:616-0.89

TETRALOGY OF FALLOT: DIAGNOSTICS AND SURGICAL TREATMENT. LITERATURE REVIEW

ABOUT THE AUTHORS

Sagatov I.Y. –
Ph.D., Head of Scientific management Department of A.N. Syzganov National Scientific center of Surgery

Sagatov I.Y., Shmonin V.M.
National Scientific Center of Surgery named after A.N. Syzganov, Almaty, Kazakhstan

Abstract

The article presents the current views on diagnostics and surgical treatment of tetralogy of Fallot. The described methods of palliative and radical correction of tetralogy of Fallot, presents an immediate and remote results of surgical treatment. Particular attention is paid to new innovative methods for the restoration of anatomical and hemodynamic disorders in tetralogy of Fallot.

Keywords
tetralogy of Fallot, radical correction, the results

Фалло тетрадасы: диагностикасы мен оталау емі. Әдебиет шолуы

АВТОРЛАР ТУРАЛЫ

Сағатов І.Е. –
м.ғ.д., А.Н.Сызғанов атындағы ҰҒХО-ң ҒЗЖ менеджменті бөлімінің басшысы

Сағатов І.Е., Шмонин В.М.
А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығы, Алматы, Казақстан

Аңдатпа

Мақалада Фалло тетрадасының диагностикасы мен оталау емінің заманауи көзқарастары келтірілген. Сонымен қатар, Фалло тетрадасының паллиативті және радикалды емдеу әдісі, хирургиялық емнің жақын және алшақ қорытындылары келтірілген. Фалло тетрадасындағы анатомиялық және гемодинамикалық бұзылыстарды қалпына келтірудің жаңа инновациялық әдістеріне ерекше көңіл бөлінген.

Түйін сөздер
Фалло тетрадасы, радикалды ота, нәтижелері

Тетрада Фалло: диагностика и хирургическое лечение. Обзор литературы

ОБ АВТОРАХ

Сагатов И.Е. –
д.м.н., руководитель отдела менеджмента НИР ННЦХ им. А.Н. Сызганова

Сагатов И.Е., Шмонин В.М.
Национальный научный центр хирургии им. А.Н. Сызганова, Алматы, Казахстан

Аннотация

В статье представлены современные взгляды на диагностику и хирургическое лечение тетрады Фалло. Описаны методы паллиативной и радикальной коррекции тетрады Фалло, представлены непосредственные и отдаленные результаты хирургического лечения. Отдельное внимание уделено новым инновационным методам восстановления анатомических и гемодинаимческих нарушений при тетраде Фалло.

Ключевые слова
тетрада Фалло, радикальная коррекция, результаты

Background

Frequency of tetralogy of Fallot (TOF) riches 6-7% among congenital heart disease (CHD) or 0,21 – 0,26 per 1000 newborns. 30% of children with TOF die in their first year of life [10, 17, 20]. Among cyanotic forms of CHD in children older than a year TOF's frequency reaches 50-75%. Amidst the vices, requiring surgical treatment in the childrens in early age, TOF takes third place after patent ductus arteriosus (PDA) and ventricular septal defect (VSD) making up 14,9%. TOF includes four anomalies: VSD, obstruction of the outflow of blood from the right ventricle, the location of the aorta above the defect of the interventricular septum (dextraposition), hypertrophy of the right ventricle.

The name itself is historically closely connected with a name of a pathologist from Marseille Fallot E.-L. A., who sistematized observation and described clinical picture and pathological anatomy by highlighting the defect as an independent nasological unit in 1888.

The basis of formation of a heart of a child with TOF is a rotation of an arterial cone counterclockwise. As are sults of this phenomenon aortic valve keeps its embryological position and remains to the right of the pulmonary. Such a "right position" of the aortic root leads to the fact that with TOF it seems to be sitting astride the septum. Should be understood, however, that essence of dextraposition of aorta in such cases determined not only by its location above the interventricular septum, but also by rotating the arterial cone counter clockwise. Moreover, rotation of arterial cone counterclockwise at the same time causes anterior and left displacement of the right arterial (pulmonary) cone. These factors explain a certain lengthening of the pulmonary cone and anterior displacement of the aortic valve relative to the atrioventricular.

Rotation of the arterial cone counterclockwise simultaneously leads to the rotation of the septum of the arterial cone, which, along with parallel anterior displacement, does not allow it to connect to the interventricular septum (which explains the presence of VSD in TOF) and the bulbous-ventricular fold. In addition, the anterior displacement of the septum - arterial cone causes a narrowing of the pulmonary cone. Inthatway, rotation of the arterial cone counter clockwise is the main factor affectingto the formation of TOF. This is a separate independent process, not related to the underdevelopment of the arterial trunk, which determines the "uneven division of the bulb" (according to the characteristics of domestic authors) and allows to understand a number of issues that cannot be explained by the concept of "correct bulb of the heart". Upon the main features of cardiac embryogenesis in this defect, it is also worth noting the "resorption" of the middle portion of the bulbo-ventricular fold, which determines the presence of mitral-aortic fibrous contact [17].

A review of the literature shows variant anomalies are associated as a single anomaly with TOF; coarctation of the aorta, anomalous left coronary artery originates from the pulmonary artery or a coronary fistula to the pulmonary trunk, left pulmonary artery (LPA) sling, or unilateral absence of pulmonary artery. But the association of TOF with LPA sling, ARCAPA, and tracheal bronchus was not described to date in the literature [1].

Diagnostics

Chest X-ray. A typical radiological picture of a patient with TOF is characterized by the following symptoms:

1) depletion of pulmonary blood flow;
2) the "retraction" of the arc of the pulmonary artery along the left contour of the heart in a direct projection;
3) the characteristic configuration of the heart in the form of a "wooden shoe" due to the top rounded and raised above the diaphragm;
4) an increase and hypertrophy of the right heart.

In patients with TOF after previously performed surgical interventions, in particular systemic pulmonary anastomoses, there might be seen asymmetry of the pulmonary pattern due to its moderate amplification in the basal zone from the side of the operation may be observed. In rare cases, after the operation of the "central" systemic pulmonary anastomoses and the development of such a rare complication as pulmonary hypertension in a child, the pulmonary pattern may be "chopped off" on the periphery.The pale form of TOF is characterized by radiological signs of normovolemia of the pulmonary circulation or even by an increase in the pulmonary pattern in arterial type. The presence of major aorto-pulmonary collateral arteries (MAPCA) in a patient with TOF leads to the formation of a pulmonary pattern represented by narrow convoluted vessels.

At the present stage of the development of diagnostics, using two-dimensional echocardiographic and Doppler echocardiographic studies, TOF can be fully verified with a detailed assessment of each of the anatomical components of the defect.

The use of echocardiography in the diagnostic of TOF algorithm allows:

– to detail the components and level of stenosis of the excretory tract of the right ventricle (subvalvular, supravalvular);
– to determine the size and evaluate the degree of hypoplasia of the valve ring of the pulmonary artery, the trunk of the pulmonary

artery itself and the initial departments of the branches of the pulmonary artery;
– visualize and describe the localization and size of the cerebrospinal fluid;
– assess the degree of aortic dextraposition;
– to identify the presence of mitral-aortic contact, which is a decisive moment in the differential diagnosis between TOF and double passage of vessels from the right ventricle.

An important task in conducting echocardiography in a patient with TOF is to determine the degree of balance of the ventricles of the heart by assessing their linear dimensions (final systolic and diastolic volume).For surgeons, such an echocardiographic indicator as indexed (correlated with the patient's body surface area) final diastolic volume of the left ventricle has a great importance, allowing to judge the degree of development of the ventricle and its functional capabilities.So, with the value of this indicator less than 35 ml/m2, the condition of the ventricle is regarded as anatomical hypoplasia, which determines the further choice of the method of surgical treatment - the implementation as the first stage of various options for systemic-pulmonary anastomoses.

The use of two-dimensional Doppler echocardiography when examining a patient with TOF makes it possible:
– to assess the degree of stenosis of prostate cancer by determining the gradient of systolic pressure between the right ventricle and pulmonary artery, which, as a rule, reaches sufficiently large values (of the order of 100 mm Hg);
– identify the presence of antegrade blood flow through the valve of the pulmonary artery;
– to detect additional systolodiastolic flows in the lumen of the pulmonary artery in the presence of PDA or MAPCA.

In addition to determining the main anatomical components of Echocardiography defect, the study can help in visualizing concomitant intracardiac abnormalities, such as atrial communication, additional defects of the interventricular septum, insufficiency of the atrioventricular valves, abnormal location of the initial parts of the coronary arteries crossing the right ventricular outflow tract (RVOT), and others.

In case of unsatisfactory visualization of the structures of the heart and blood vessels during echocardiography, as well as to identify additional abnormalities (atresia of one of the pulmonary arteries, deformity of branches due to previous palliative operations, suspected peripheral pulmonary stenosis), the cardiac cavity catheterization and angiocardiography are used in the diagnostic algorithm of TOF.

Cardiac catheterization and angiocardiography. These research methods are fundamental to formulate the final clinical diagnosis and determine the type and extent of surgical intervention.

The use of angiocardiography with angiomorphometry in patients with TOF allows you to:
– study in detail the levels of narrowing (subvalvular, at the level of the pulmonary artery ring, supravalvular) and the degree of narrowing of the excretory tract of the right ventricle;
– identify concomitant anomalies, such as coarctation of the aorta, abnormal drainage of the pulmonary veins, defect in the aortopulmonary septum, double aortic arch, etc .;
– diagnose the presence of messages between the aorta and the trunk of the pulmonary artery;
– indirectly assess the size of the left ventricle;
– determine the degree of development of the pulmonary artery system with angiomorphometric calculations (calculation of the Nakata and McGoon indices, as well as the ratio of the diameters of different sections of the pulmonary arterial tree to the diameter of the descending aorta at the diaphragm).

Angiocardiography studies in patients with TOF are performed:
– right ventriculography in direct and lateral projection;
– pulmonary arteriography in direct and axial projection;
– left ventriculography;
– aortography.

Right ventriculography in direct and lateral projection with TOF allows to:
– to visualize multicomponental (most cases) stenosis of RVOT on account of subvalve, valve and supravalve components;
– in directly estimate the level of development of pulmonary arterial bed;
– identify pronounced regurgitation on the venous atrioventricular valve;
– measure the pressure in the right ventricle and pulmonary artery and determine the systolic pressure gradient between the right ventricle and pulmonary artery, it is calculated by pressure curves, obtained while conducting a catheter from the right ventricle to the pulmonary artery.

When performing aortography in patients with TOF, the following are possible:
– diagnosis of the presence of extracardiac systemic pulmonary shunts (open ductus arteriosus, aorto-pulmonary septal defect, previously performed systemic pulmonary anastomoses);
– assessment of the number and degree of development of the large aorto-pulmonary collaterals;

– identification of pathology of the aortic arch (coarctation of the aorta, vascular rings);
– determination of the presence and course of coronary arteries crossing the RVOT.

The left ventriculography in the diagnosis of TOF helps to assess the size and development of the left ventricle, the degree of aortic dextraposition, confirm the presence of mitral-aortic contact, pulmonary trunk and pulmonary arteries. For a angiocardiometry, an analysis of angiocardiograms is carried out under the condition of a clear visibility of all segments of the pulmonary artery in frames in dynamics in phases from the final diastole to the final systole. Since the valve ring, pulmonary trunk and pulmonary arteries in the systole phase have maximum dimensions, the calculations are carried out in this phase of the cardiac cycle in direct projection, adjusted for magnification.

When conducting angiomorphometric calculations in patients with TOF, the following indicators are evaluated: pulmonary arterial index (Nakata index), McGoon index.The Nakata Index was developed and proposed with the aim of indirectly evaluating blood flow in each lung in patients with CHD with reduced pulmonary blood flow [15]. This technique involves the calculation of the pulmonary arterial index based on the ratio of the sum of the cross-sectional areas of each branch of the pulmonary artery at the level of the discharge of the first upper lobar branch to the surface area of the patient's body. Based on the obtained data, it is possible to determine the passage of a sufficient amount of blood to the peripheral sections of the pulmonary arterial bed, which indirectly confirms the absence of an obstacle at this level after performing a radical correction of TOF. According to the authors who proposed the calculation of this indicator, the value of the pulmonary arterial index above 150 mm^2/m^2 is a criterion for the possibility of performing radical surgery in patients with TOF, with lower values it is recommended to perform palliative interventions. Normally, the value of this indicator is on average 300 + 30 mm^2/m^2.

The McGoon index is the ratio of the sum of the diameters of the mouths of the branches of the pulmonary artery (B1+C1) to the diameter of the descending aorta (dAo) and reflects the degree of development of the central departments of the main branches of the pulmonary artery. Normally, the value (B1+C1)/dAo is at least 1,5. A lower value of this indicator indicates the presence of local wellhead stenosis of the main branches of the pulmonary artery, requiring reconstruction with a radical correction of TOF.

The ratio of the diameters of different sections of the pulmonary arterial tree with the diameter of the descending aorta at the diaphragm level in patients with CHD is also an important angiomorphometric parameter characterizing the presence of local narrowing of various sections of the pulmonary arterial bed, requiring elimination during surgical treatment of the defect.

Angiocardiographic examination with angiomorphometry has a great importance for determining the variant anatomy of the defect, the volume of surgical intervention and predicting the immediate and long-term results of the operation.

Surgical treatment

There is no doubt for the need of surgical care for patients with tetralogy of Fallot.Over the course of more than 60 years of surgical history of the treatment of the disease, various options for palliative interventions have been developed and proposed, including endovascular procedures, as well as a technique for radical correction of TOF [1, 2, 18, 21, 22, 26, 27]. The choice of one or another method of surgical correction is determined by:

1) symptomatic course of vice;
2) age of the patient;
3) anatomical form of the defect (the degree of development of the pulmonary arterial bed and left ventricle, the presence of MAPCA);
4) degree of an arterial hypoxemia.

Palliative interventions

Palliative interventions performed according to a closed method should primarily include various options for systemic-pulmonary anastomoses:

– classic Blalok-Taussig anastomosis (using the subclavian artery sewn into the branch of the pulmonary artery);
– Waterstone-Cooley anastomosis - between the right pulmonary artery and the ascending aorta;
– Potts anastomosis - between the descending aorta and the left pulmonary artery;
– anastomosis between the pulmonary and subclavian arteries using a synthetic prosthesis (modified Blalok-Taussig anastomosis);
– central anastomosis between the ascending aorta and the trunk of the pulmonary artery using a prosthesis.

Indications for performing such operations are:

– symptomatic flow of the defect with the heavy dyspnea-cyanotic sezarius of anamnesis;
– the heavy clinical station of a patient, due to severe arterial hypoxemia (arterial blood oxygen saturation of 75%);
– the presence of echocardiographically confirmed anatomical hypoplasia of the left ventricle (the value of the indexed EDV of the left ventricular (LV)) is less than 35 ml/m^2 in combination with the small size of the mitral valve fibrous ring);

– long-term administration of b-blockers by the patient.

The creation of systemic-pulmonary anastomoses, as a rule, leads to an improvement in the clinical condition of the child due to a decrease in the degree of arterial hypoxemia, makes it possible to prepare the LV for subsequent radical correction (RC) of TOF due to the increased functional load on it due to the increased return of blood to the left heart, and may also lead to an increase in the pulmonary arterial bed on the side of the operation performed.

Another type of palliative intervention performed according to a closed procedure is various endovascular procedures. It includes:

1) transluminal balloon valvuloplasty of pulmonary valvular stenosis in TOF (with dominance of the valve component of stenosis of the excretory part of the right ventricle) [16];
2) transluminal balloon angioplasty and stenting of the central and peripheral departments of the branches of the pulmonary artery (in the presence of hemodynamically significant local narrowing of the pulmonary arterial bed);
3) Embolization of the large aorto-pulmonary collaterals, which are an additional source of blood flow to the pulmonary circulation. As a palliative, some authors use stenting of RVOT. A significant increase in blood saturation was noted. Repeated echocardiography before surgery showed a statistically significant increase in the size of the right and left pulmonary arteries, as well as an altered ratio of McGoon ($p<0,05$). RVOT stenting is a safe and beneficial option for patients with TF with surgical risk factors or adverse anatomy. By increasing pulmonary blood flow, improving blood saturation and providing pulmonary artery growth, this method is a bridge for the surgical repair of the defect [3, 23].
4) Some authors suggest permanent electrical stimulation of the right ventricle in patients after radical correction of TOF. They note that chronic apical stimulation of the RV after TOF correction leads to an improvement in the clinical status with preservation of the systolic function of the pancreas and prevention of progressive prolongation of the QRS segment. Therefore, pacing may be useful in patients in the postoperative period after TOF correction, in whom there are signs of RV insufficiency [4, 8, 9, 14].

Radical correction of tetralogy of Fallot

With a favorable anatomical variant of TOF, primary radical correction of the defect is possible. The main conditions for implementing this are:

– symptomatic course of the defect;
– patient's age more than 3 months;
– absence of LV hypoplasia (index of indexed EDV LV of more than 35 ml/m^2);
– satisfactory development of the pulmonary arterial bed (Nakata index more than 200 mm^2/m^2);
– moderate manifestations of arterial hypoxemia (arterial blood oxygen saturation of more than 75%);
– lack of pronounced, hemodynamically significant MAPCA;
– lack of a long history of b-blockers in anamnesis.

The operation of the RC TOF is performed in the conditions of cardiopulmonary bypass, hypothermia and combined pharmacological cold cardioplegia and includes three main stages:

1) resection of infundibular stenosis;
2) plastic VSD;
3) reconstruction of RVOT.

The first stage is the resection of infundibular stenosis. In 90-95% of cases with TF, there is a need to expand the output section of the right ventricle and the trunk of the pulmonary artery, in connection with which the longitudinal right venntriculotomy is indicated. The pancreas is opened in the excretory section in the avascular zone by a longitudinal section.

After ventriculotomy, the infundibular stenosis is revised, the degree of displacement and hypertrophy of the conical septum is assessed. Then proceed to the dissection and resection of the muscle bundles of the hypertrophic conical septum. First, the parietal pedicle of the conical septum is widely dissected, avoiding damage to the valves of the aortic valve. Further, the very structure of the conical septum is partially resected. Where in, care should be taken, since damage to the septal branches of the left coronary artery, as well as perforation of the interventricular septum itself, is possible.

Valvular stenosis of the pulmonary artery is eliminated by dissection of fused cusps along the commissures or by partial edge resection of the cusps during their severe deformation, after which the pulmonary valve ring should pass a metal bouge of a calculated diameter corresponding to the surface of the patient's body. However, quite often with TF, there is hypoplasia of the ring and trunk of the pulmonary artery, in connection with which the ventriculotomic incision is extended through the ring of the pulmonary artery to its trunk until bifurcation and the sizes of the branches of the pulmonary artery are estimated using metal bougie of the calculated diameter.

The second stage is the closure of the VSD. Access to the VSD during plastic surgery is based

on the anatomical location of the defect. With TOF, the most common non-restrictive subaortic VSD cancer, in connection with which the plastic defect is performed through atrial access. The subarterial location of the cerebrospinal fluid is much less common, and its closure is done through extraventriculotomy. Xenopericardium or synthetic material is used as a patch for plastic surgery of VSD. When determining the size of a patch for VSD, focus should be set on the size of the aortic root and the defect itself, since the size of the patch should correspond to the diameter of the aortic root and slightly exceed the size of the defect. Ficcation of the patch on sides of the defect carried out by continuous wrapping or separate U-shaped seams on gaskets in compliance with those anatomical landmarks, which were mentioned earlier. One of the features of stitching on to the patch is the presence one additional ficsating U-shaped seam behind the base of the septal valve of the tricuspid valve.

The third stage, RC of TOF, includes reconstruction of RVOT, which is carried out under control of metal meter for a given body surface area.In most cases, transannular plastic surgery of the prostate gland and the trunk of the pulmonary artery is performed using a xenopericardial patch with a monostable. As studies showed, monostable locking function is important enough in soon postoperative period after RC of TOF, since, acting as a valve of the pulmonary artery, it prevents the volume overload of the right ventricle at the time of diastole due to the lack of reverse blood flow from the pulmonary artery to the right ventricle.Thus, the use of a single-leaf during the reconstruction of RVOT is mandatory in cases of gross changes and deformations of the own valves of the pulmonary valve, when they undergo complete or partial resection.The patch is fixed to the edges of the ventriculotomy incision and the incision of the trunk of the pulmonary artery using a continuous entwined prolene suture.

The following angiomorphometric data should be considered indications for the plastic expansion of the main branches of the pulmonary artery with RC TOF:

1) the ratio of the sum of diameters of orifice of the main branches in the pulmonary arteries to the diameters of the descending aorta is less than 1,5, or (B1+C1)/dAo< 1,5;
2) index Nakata less than 250 mm^2/m^2;
3) presence of a local construction of the main branches of a pulmonary arteriesmore than 50% of the promised diameters of vessels.

The criteria of adequation of an implemented RC of TOF. There is used the relations of peak systolic pressure on the right ventricle and the left ventricle as the main criteria for eliminating of abstraction in a small circle of a blood circulation for the estimation of the adequation of ablation of abstraction RVOT after fulfillment of RC of TOF. The reiss till nounified opinion about permissible value of this indicator in the literature.

References

1. Benjaout K, Mitchell J, Gauthier J, Ninet J. Correction of Tetralogy of Fallot Associated With Anomalous Coronary Artery Without Extracardiac Conduit. World J Pediatr Congenit Heart Surg. 2020 May;11(3):343-345. doi: 10.1177/2150135120903281.
2. Buechel ER, Dave HH, Kellenberger CJ, Dodge-Khatami A, Pretre R, Berger F, et al. Remodelling of the right ventricle after early pulmonary valve replacement in children with repaired tetralogy of Fallot: assessment by cardiovascular magnetic resonance. Eur Heart J. 2005; 26:2721-7.
3. Castleberry CD, Gudausky TM, Berger S, Tweddell JS, Pelech AN. Stenting of the right ventricular outflow tract in the high-risk infant with cyanotic teratology of Fallot. Pediatr Cardiol. 2014 Mar;35(3):423-30. doi: 10.1007/s00246-013-0796-z.
4. Cleland JG, Daubert JC, Erdmann E, Freemantle N, Gras D, Kappenberger L, et al. The effect of cardiac resynchronization on morbidity and mortality in heart failure. N Engl J Med. 2005;352:1539-49.
5. Davlouros PA, Kilner PJ, Hornung TS, Li W, Francis JM, Moon JC, et al. Right ventricular function in adults with repaired tetralogy of Fallot assessed with cardiovascular magnetic resonance imaging: detrimental role of right ventricular outflow aneurysms or akinesia and adverse right-to-left ventricular interaction. J Am Coll Cardiol. 2002;40:2044-52.
6. Doughan AR, McConnell ME, Lyle TA, Book WM. Effects of pulmonary valve replacement on QRS duration and right ventricular cavity size late after repair of right ventricular outflow tract obstruction. Am J Cardiol. 2005;95:1511-4.
7. d'Udekem d'Acoz Y, Pasquet A, Lebreux L, Ovaert C, Mascart F, Robert A, et al. Does right ventricular outflow tract damage play a role in the genesis of late right ventricular dilatation after tetralogy of Fallot repair? Ann Thorac Surg. 2003;76:555-61; discussion 561.
8. El-Shabrawi M, Lotfy W, Hegazy R, Abdelaziz O, Sobhy R, Abdelmohsen G, Ibrahim H, Dohain AM. Evolution of ventricular function in children with permanent right ventricular pacing after tetralogy of Fallot repair: A midterm follow-up. J Card Surg. 2020 Feb 24. doi: 10.1111/jocs.14477.
9. Gatzoulis MA, Balaji S, Webber SA, Siu SC, Hokanson JS, Poile C, et al. Risk factors for arrhythmia and sudden cardiac death late after repair of tetralogy of Fallot: a multicentre study. Lancet. 2000;356:975-81.
10. Geva T, Sandweiss BM, Gauvreau K, Lock JE, Powell AJ. Factors associated with impaired clinical status in long-term survivors of tetralogy of Fallot repair evaluated by magnetic resonance imaging. J Am Coll Cardiol. 2004;43:1068-74.

11. Han S, Zhang YY, Meng MY, Hou ZL, Meng P, Zhao YY, Gao H, Tang J, Liu Z, Yang LL, Jiang LH, Li YX. Generation of human iPSC line from a patient with Tetralogy of Fallot, YAHKMUi001-A, carrying a mutation in TBX1 gene. Stem Cell Res. 2020 Jan;42:101687. doi: 10.1016/j.scr.2019.101687.
12. Helbing WA, Roest AA, Niezen RA, Vliegen HW, Hazekamp MG, Ottenkamp J, et al. ECG predictors of ventricular arrhythmias and biventricular size and wall mass in tetralogy of Fallot with pulmonary regurgitation. Heart. 2002;88:515-9.
13. Ihab Khatib, Emmanuel Lebret, Virginie Lambert, Sebastien Hasco et. Tetralogy of Fallot associated with multiple anomalies. European Heart Journal, Volume 38, Issue 4, 21 January 2017, Page 246, https://doi.org/10.1093/eurheartj/ehw406
14. Khairy P, Fournier A, Thibault B, Dubuc M, Therien J, Vobecky SJ. Cardiac resynchronization therapy in congenital heart disease. Int J Cardiol. 2006;109:160-8.
15. Nakata S.Y., Imai Y., Takanashi Y. et al. Y. A new method for the quantitative standardization of cross – sectional areas of the pulmonary arteries in congenital heart diseases with decreased pulmonary blood flow. J Torac Cardiovasc Surg, 1984, Vol. 88., P.610-619.
16. Qureshi S.A., Kirk C.R., Lamb R.K., Arnold R., Wilkinson J.L. Balloon Dilatation of the Pulmonary Valve in the First Year of Life in Patients With Tetralogy of Fallot: A Preliminary Study. Br Heart J, Sep 1988, 60(3), 232-235.
17. Podzolkov VP., Kokshenov IV. Tetralogy of Fallot. - M.: A.N. Bakulev National Medical Research Center of Cardiovascular Surgery, 2008.
18. Richard D Mainwaring, Frank L Hanley. Tetralogy of Fallot Repair: How I Teach It. Ann Thorac Surg Dec 2016, 102(6), 1776-1781.
19. Roest AA, Helbing WA, Kunz P, van den Aardweg JG, Lamb HJ, Vliegen HW, et al. Exercise MR imaging in the assessment of pulmonary regurgitation and biventricular function in patients after tetralogy of Fallot repair. Radiology. 2002;223:204-11.
20. Sagatov IY. Modeling of the operational risk in patients with congenital heart diseases. Cardiology 2015/6/1. 131:29-30.
21. Sung SC, Kim S, Woo JS, Lee YS. Pulmonic valve annular enlargement with valve repair in tetralogy of Fallot. Ann Thorac Surg. 2003;75:303-5.
22. Therrien J, Provost Y, Merchant N, Williams W, Colman J, Webb G. Optimal timing for pulmonary valve replacement in adults after tetralogy of Fallot repair. Am J Cardiol. 2005;95:779-82.
23. Valderrama P, Garay F, Springmьller D, Briones Y, Aguirre D, Gonzбlez R, Becker P, Zamora G, Sбnchez L, Castillo G, Palominos G, Cбrdenas L. Initial Experience in Chile with Stent Implantation in the Right Ventricle Outflow Tract in High-Risk Patients with Tetralogy of Fallot. Pediatr Cardiol. 2020 Feb 27. doi: 10.1007/s00246-020-02321-2.
24. van den Bosch E, Bogers AJJC, Roos-Hesselink JW, van Dijk APJ, van Wijngaarden MHEJ, Boersma E, Nijveld A, Luijten LWG, Tanke R, Koopman LP, Helbing WA. Long-term follow-up after transatrial-transpulmonary repair of tetralogy of Fallot: influence of timing on outcome. Eur J Cardiothorac Surg. 2019 Dec 23. pii: ezz331. doi: 10.1093/ejcts/ezz331.
25. van Huysduynen BH, van Straten A, Swenne CA, Maan AC, van Eck HJ, Schalij MJ, et al. Reduction of QRS duration after pulmonary valve replacement in adult Fallot patients is related to reduction of right ventricular volume. Eur Heart J. 2005;26:928-32.
26. van Straten A, Vliegen HW, Lamb HJ, Roes SD, van der Wall EE, Hazekamp MG, et al. Time course of diastolic and systolic function improvement after pulmonary valve replacement in adult patients with tetralogy of Fallot. J Am Coll Cardiol. 2005;46:1559-64.
27. Vida VL, Triglia LT, Zanotto L, Zanotto L, Bertelli F, Padalino M, Sarris G, Protopapas E, Prospero C, Pizarro C, Cleuziou J, Myers PO, Prktre R, Poncelet AJ, Meyns B, Van den Bossche K, Accord RE, Gil-Jaurena JM, Sakurai T, StellinG. Late management of the aortic root after repair of tetralogy of Fallot: A European multicentre study. J Card Surg. 2020 Jan;35(1):40-47. doi: 10.1111/jocs.14316.

SHUNT PATENCY AND EVALUATION METHODS IN PATIENTS WITH RECURRENT STENOCARDIA AFTER SURGICAL CORRECTION OF CHD AT THE HOSPITAL STAGE

УДК: [616.132.2+616.12-009.72]:616.12-089

Aitkozhin G.K., Israilova V.K., Sandybai B.M., Baydildaev A.A.
NJSC “National Medical University named after S.D. Asfendiyarov”, Almaty, Kazakhstan

ABOUT THE AUTHORS

Aitkozhin Galym Kalelovch *– Doctor of Medical Sciences, Professor of the Department of Surgical Diseases No. 3, KazNMU named after S.D. Asfendiyarov,*

Israilova Venera Karypbekovna *– MD, professor, head of the course of anesthesiology and intensive care, Kaz.NMU named after S.D. Asfendiyarov,*

Sandybai Bakhyt Muratovich *– Surgeon*

Baydildaev Abay Aitbaevich *– Therapist*

Abstract

Coronary shuntography represents the “gold standard” of evaluating the coronary bypass grafting results. Today it is practically the only method allowing: detailed analysis of complications; the possibility of direct visualization of shunts of all types and localizations; the detection of occlusion and stenosis, their localization, severity and extension; the possibility of simultaneous direct reliable assessment of the proximal and distal coronary bed state; determination of progression degree and localization of atherosclerosis – which in turn helps to increase the effectiveness of direct revascularizing operations in patients with coronary artery disease.

Keywords
CA - coronary arteries, CABG – coronary artery bypass grafting, MCA - mammary-coronary anastomosis, LITA - left internal thoracic artery, RITA - right internal thoracic artery, RA - radial artery

Госпитальдық кезеңде ЖИА-ны хирургиялық түзетуден кейінгі қайталама стенокардиясы бар науқастардағы шунттың өтімділігі және оны бағалау әдістері

АВТОРЛАР ТУРАЛЫ

Айткожин Галым Калелович *– медицина ғылымдарының докторы, С.Д. Асфендияров ат. ҚазҰМУ-дың № 3 хирургиялық аурулар кафедрасының профессоры.*

Исраилова Венера Карыпбековна *– медицина ғылымдарының докторы, С.Д. Асфендияров ат. ҚазҰМУ-дың анестезиология және реанимация курсының мең. Профессоры.*

Сандыбай Бахыт Муратович *– Хирург дәрігер*

Байдилдаев Абай Айтбаевич *– Терапевт дәрігер*

Айткожин Г.К., Исраилова В.К., Сандыбай Б.М., Байдилдаев А.А.
С.Д. Асфендияров ат. Қазақ Ұлттық Медицина Университеті, Алматы, Казақстан

Аңдатпа

Шунтокоронарография – коронарлы шунттаудың нәтижелерін бағалауға арналған «алтын стандарт». Бүгінгі таңда ол асқынуларды толық тексеруді жүргізуге, түрлі типтегі және локализациядағы шунттардың барлығын тікелей визуализациялауға, окклюзиялар мен стеноздарды анықтауға, көрінім мен ұзындық деңгейін айқындауға, бір мезертте проксимальды және дистальды коронарлы арнаны тікелей, нақты бағалауға, өз кезегінде ЖИА-сы бар науқастардағы тіке реваскуляризациялық оталардың тиімділігін арттыруға ықпал ететін, атеросклероздың асқыну локализациясын және деңгейін анықтауға мүмкіндік беретін бірден бір әдіс.

Түйін сөздер
КА – коронарлы артериялар, МКШ – маммаро – коронарлы шунттау, СЖІКА – сол жақ ішкі кеуде артериясы, ОЖІКА - оң жақ ішкі кеуде артериясы, КА – көріжілік артериясы

Проходимость шунтов и методы ее оценки у больных с возвратной стенокардией после хирургической коррекции ИБС на госпитальном этапе

ОБ АВТОРАХ

Айткожин Галым Калелович – *доктор медицинских наук, профессор кафедры хирургических болезней № 3 Каз.НМУ им. С.Д. Асфендиярова*

Исраилова Венера Карыпбековна – *доктор медицинских наук, профессор зав. курсом анестезиологии и реанимации Каз. НМУ им. С.Д. Асфендиярова*

Сандыбай Бахыт Муратович – *Врач-хирург*

Байдилдаев Абай Айтбаевич – *Врач терапевт*

Айткожин Г.К., Исраилова В.К., Сандыбай Б.М., Байдилдаев А.А.
Казахский Национальный Медицинский Университет им. С.Д. Асфендиярова, Алматы, Казахстан

Ключевые слова
КА – коронарные артерии, МКШ – маммаро – коронарное шунтирование, ЛВГА- левая внутренняя грудная артерия, ПВГА – правая внутренняя грудная артерия, ЛА – лучевая артерия

Аннотация

Шунтокоронарогрфия представляет собой "золотой стандарт" для оценки результатов коронарного шунтирования. На сегодняшний день она практически единственная позволяет проводить детальный анализ осложнений, возможность прямой визуализации шунтов всех типов и локализаций, выявление окклюзии и стенозов, их локализации, степени выраженности и протяженности, возможность одновременной прямой достоверной оценки состояния проксимального и дистального коронарного русла, определение степени и локализации прогрессирования атеросклероза, что в свою очередь способствует повышению эффективности прямых реваскуляризирующих операций у больных ИБС.

In coronary surgery, the question of shunt patency is an important aspect of assessing the results of direct myocardial revascularization, since only with passable shunts and their high-quality functioning we can talk about successful coronary bypass surgery. The completeness of myocardial revascularization and the functional state of coronary artery bypass grafts largely determine the prognosis of surgical intervention. The problem of occlusion of shunts remains unresolved. Most often the shunts closing during the first year after operation. Occlusion of venous shunts during the first year after surgery is observed in 25-30% of patients, then for 5-7 years the frequency of occlusion is about 2% per year, after this period - 5% per year. The main reasons that can lead to shunt dysfunction are: 1-technical (damage to the endothelial layer and walls of the autovenous graft when it is taken, excessive length and bend of the shunt, tension of the shunt due to its insufficient length, improper choice of the location of the distal anastomosis); 2- anatomical factors; 3 - general factors (low volumetric blood flow velocity by shunt, instability of general hemodynamics, massive adhesions in the pericardial cavity, hypercoagulation, purulent mediastinitis, and, according to Rabotnikov V.S. [13], a prolonged febrile condition and inadequate intake of anticoagulants.

Shunt patency and evaluation methods

There are several methods for determining the patency of shunts. These methods can be divided into direct, allowing to explore shunts directly, and indirect. Direct methods include 1-electromagnetic flowmetry, 2 - radiopaque shuntography. 3-computed tomography. The basic principles of modern treatment of patients with coronary artery disease are to restore blood supply to the coronary arteries and improve the function of ischemic myocardium [1, 5, 6, 7, 13, 16, 17, 18, 21]. Currently, achievements of reconstructive coronary surgery require a review of treatment outcomes for patients with CHD. Maintaining myocardial function in satisfactory condition without a full main blood supply is not always considered as optimal. At the present stage, the possibilities of direct vascularizing operations on the spacecraft allow striving to restore adequate blood supply in the ischemic myocardium in patients with coronary artery disease in most cases [2]. One of the main reasons for unsuccessful outcomes is thrombosis of the operated vascular segment (graft + coronary artery) in the immediate postoperative period. An analysis of the causes of thrombosis at the hospital stage, as well as the frequency of their occurrence and the prevention of these complications, occupy one of the leading places in the study of the problem of surgical treatment in patients with CHD [1, 10, 11, 12, 14, 17, 20].

Shuntography is the "gold standard" for evaluating CABG results. Today it is practically the only method allowing to perform detailed analysis of complications, which in turn helps to increase the effectiveness of direct revascularizing operations in patients with CHD. The advantages of this method include the following: the possibility of direct visu-

alization of shunts of all types and localizations; the detection of occlusion and stenosis, their localization, severity and extension; the possibility of simultaneous direct reliable assessment of the proximal and distal coronary bed state; the determination of degree and localization of the progression of atherosclerosis [2 , 3, 4, 8, 9, 15, 17, 19, 22].

The results of coronary shuntography at the hospital stage

In research, 66 patients underwent repeated coronary angiography and shuntography at the hospital stage, in the period from 9 to 30 days after CABG. Depending on the method of myocardial revascularization, they were divided into 3 groups.

Group 1 - patients with autovenous shunts only, group 2 – with one ITA used in combination with venous bypass grafting, and group 3 - with two or more autoarterial conduits in combination with venous shunts. A total of 52 autovenous shunts were placed in 1 study group (the average number of distal anastomoses was 2,9).

In the 2 study group, 28 patients underwent CABG using one arterial conduit in combination with autovenous bypass grafting. A total of 78 shunts were placed (the average number of distal anastomoses was 2,8 per patient). The number of autovenous grafts was 50 (64.0%), the number of autoarterial conduits was 28 (36.0%), of which 24 - LITA, 2 - RITA, 2 - RA.

In the 3 study group, 20 patients underwent CABG using two or more arterial conduits in combination with autovenous bypass grafting. A total of 56 shunts were placed (an average of 2,8). The number of autovenous grafts was 16 (28.6%), the number of autoarterial grafts was 40 (71.4%), of which 18 - LITA, 4 - RITA and 18 - RA. In this group, LITA and RITA were in all cases excreting skeletalized without opening the pleural cavities. RA was isolated along with concomitant veins and used as a free autotranspant. The multivariate analysis became the main research method in this work. The results of shuntography in groups of patients at the hospital stage were studied depending on: 1 - the type of transplant used; 2 - the number of shunted arteries; 3 - the anatomical name of the arteries; 4 - diameter of shunted arteries; 5 - severity of stenosis of shunted arteries; 6 – mediastinitis in anamnesis.

A total of 186 shuntographs were analyzed. Shunt thrombosis was detected in 16 cases (8.6%). In 15 cases out of 118 (12.7%) thrombosis of venous shunts was revealed, in one (1.5%) (out of 68) - autoarterial graft dysfunction.

The dependence of transplant thrombosis on the number of shunted arteries is presented in table 1.

As can be seen from table 1, all shunts are passable when 1 CA is shunted. When bypassing 2 CA, 1 (2.6%) graft was thrombosed. Of 84 conduits, when 3 CA were bypassed, 6 (7.1%) were thrombosed. When shunting 4 CA, 9 (15.0%) shunts were thrombosed.

Thus, when determining the dependence of transplant thrombosis on the quantity of bypassed arteries, a clear relationship between the transplant thrombosis frequency increase and the quantity of bypassed arteries was revealed.

The dependence of venous graft thrombosis on the stenosis degree of shunted CA is presented in Fig. 1

Coronary arteries	Operations quantity	Shunt thrombosis quantity	Percentage
1 CA	4	- 0 (of 4 shunts)	0%
2 CA	19	- 1 (of 38)	2,6%
3 CA	28	- 6 (of 84)	7,1%
4 CA	15	- 9 (of 60)	15,0%

Table 1.
The dependence of transplant thrombosis on the number of shunted arteries is presented

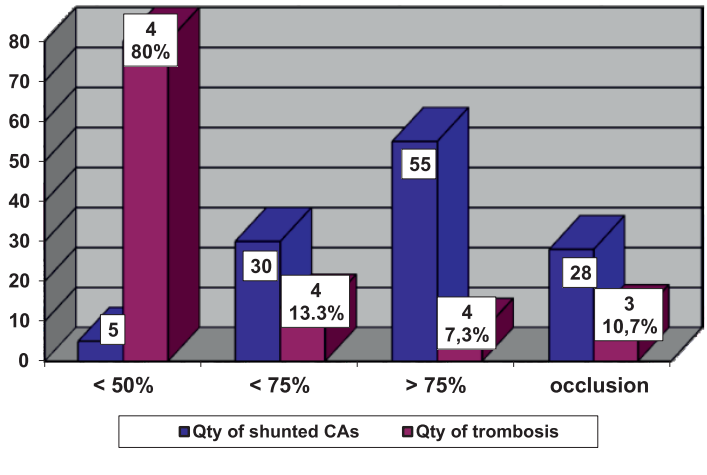


Fig. 1.
The dependence of venous graft thrombosis on the stenosis degree of CA

Table 2.
Description in text

Shunted CA diameter	Quantity of thrombosed shunts	Percentage %
1.0 mm	8 (of 20)	40
1.5 mm	5 (of 36)	13.8
2.0 mm	2 (of 76)	2.6
2.5 mm	1 (of 57)	1.8

Table 3.
Shuntography data in patients after mediastinitis

Operation type	Shuntography data
CABG-2	Thrombosis of a single venous graft
CABG-1, MCA-1	Thrombosis of a single venous graft
CABG-2, MCA-2	Thrombosis of two venous grafts

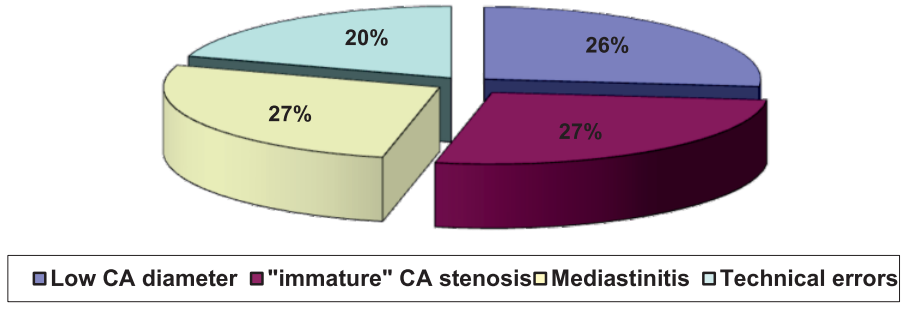
Thus, one of the leading factors causing thrombosis of autovenous grafts is CABG in patients with hemodynamically insignificant stenoses (<50%). As shown by the data presented in table 2, the patency of venous shunts directly depends on the caliber of the shunted CA. So, in shunted CA with a diameter of 1.0 mm, 40% of the shunts were thrombosed, and in shunted CA with a diameter of 1.5 mm – 13,8%. In cases of shunting of CA with a diameter of 2.0 mm and 2.5 mm, thrombosed were respectively: 2.6% and 1.8% of transplants. Consequently, the probability of anastomosed shunts thrombosis in CA with a diameter of less than 1.5 mm is 4 times higher than in shunted CA of a larger caliber. Dependence of graft thrombosis on the diameter of shunted CA.

The immediate postoperative period was complicated by anterior purulent mediastinitis in three patients (one from each group of Table 3).

As expected, in all three patients with immediate postoperative period complicated by anterior purulent mediastinitis, thrombosis of one or two autovenous shunts was revealed. Moreover, all three autoarterial shunts were passable. In the analysis, other causes of graft thrombosis in these three patients were not found. Figure 2 presents the causes of thrombosis of autovenous grafts at the hospital stage. As can be seen from fig. 2, in 4 cases the cause of thrombosis of autovenous grafts was a poor distal bed. Thrombosis developed as a result of poor shunt flow due to the small capacity of the vascular bed. Technical errors in the collection and implantation of shunts that caused thrombosis of autovenous grafts were identified in 3 cases. In 4 cases, mediastinitis was the cause of shunt thrombosis. In 4 cases, thrombosis of autovenous grafts as a result of exceeding indications for surgery and shunting of CA with “immature” stenoses (<50%) was revealed.

Thus, the only reason for an autoarterial graft (MCA) occlusion was the technical error in performing the distal anastomosis. All autoarterial grafts from RA were passable. At the same time, in 2 observations, conduits from RA turned out to be spastic arterial transplants which were eliminated after antispastic therapy. The causes of thrombosis of autovenous grafts were a poor distal bed, technical errors in the collection and implantation of shunts, which led to thrombosis of autovenous grafts and mediastinitis, and also an excess of indications for operation and shunting of CAs with immature stenoses (<50%).

Fig. 2.
Causes of autovenous graft trombosis on hospital stage



References

1. Akchurin R. S., Lepilin M. G., SHiryaev A. A. i dr. Rol’ autoarterial’noj revaskulyarizacii miokarda u pacientov s sochetannym porazheniem koronarnogo rusla i perifericheskih arterij // Angiologiya i sosudistaya hirurgiya. - 1995. - №. 2. - S. 42.
2. Alekyan B. G. Koronarnoe ruslo, gemodinamika i sokratitel’naya funkciya miokarda u bol’nyh IBS s postinfarktnym kardiosklerozom v aspekte hirurgicheskogo lecheniya. Diss. kand. med. nauk. – M. - 1980.

3. Alekyan B. G., Buziashvili YU. I., Vlasov G. P. Endovaskulyarnaya hirurgiya pri lechenii bol'nyh IBS s mnozhestvennymi porazheniyami koronarnyh arterij // Grudnaya i serdechno-sosudistaya hirurgiya. - 1996. - N. 6. - S. 230-231.
4. Ajtkozhin G.K. Hirurgicheskie podhody k razlichnym metodam revaskulyarizacii miokarda. Diss. Doktor med. nauk. - M. – 2002g..
5. Ajtkozhin G.K. Faktory riska hirurgicheskogo lecheniya bol'nyh IBS v sochetanii s mul'tifokal'nym aterosklerozom. //Gudnaya i serdechno – sosudistaya hirurgiya. Moskva 1999 g. S. 75
6. Bokeriya L. A., Berishvili I. I. Sovremennye tendencii i perspektivy razvitiya koronarnoj hirurgii // Annaly hirurgii. – 1997. - №. 4. – S. 31-45.
7. Bokeriya L. A. Transmiokardial'naya i endomiokardial'naya lazernaya revaskulyarizaciya - novyj metod hirurgicheskogo lecheniya ishemicheskoj bolezni serdca // V kn.: Minimal'naya invazivnaya hirurgiya serdca. - 1998. -M.-S. 23-40
8. Bokeriya L.A., Berishvili I.I. Transmiokardial'naya lazernaya revaskulyarizaciya v sochetanii s aortokoronarnym shuntirovaniem v lechenii bol'nyh ishemicheskoj bolezn'yu serdca //Grudnaya i serdechno – sosudistaya hirurgiya. 2001. № 2.S. 17 – 24
9. Viller A. G. Osobennosti krovosnabzheniya miokarda posle aortokoronarnogo shuntirovaniya i ih vliyanie na klinicheskij effekt operacii. Avtoref. diss. kand. med. nauk. - S.-P. - 1998.
10. ZHbanov I. V., SHabalkin B. V. Neposredstvennye rezul'taty povtornogo aortokoronarnogo shuntirovaniya // Grudnaya i serdechno-sosudistaya hirurgiya. - 1999. - №. 6. - S. 81-85.
11. ZHbanov I. V., SHabalkin B. V. Recidiv stenokardii posle aortokoronarnogo shuntirovaniya. Vybor metoda lecheniya i hirurgicheskaya taktika pri povtornoj revaskulyarizacii miokarda // Grudnaya i serdechno-sosudistaya hirurgiya. - 1999. - №. 5. - S. 29-33.
12. Knyshov G. V., Ursulenko V. I., Grachev S. D. i dr. Dinamika sostoyaniya koronarnogo rusla i funkciya autovenoznyh shuntov u bol'nyh IBS v otdalennye sroki posle aortokoronarnogo shuntirovaniya // Kardiologiya. - 1988. -N. 6.- S. 36-39.
13. Rabotnikov V. S., Malikov V. E. Sovremennye podhody k otboru bol'nyh ishemicheskoj bolezn'yu serdca na operaciyu aortokoronarnogo shuntirovaniya // Terapevticheskij arhiv. - 1988. - №. 10. - S. 15-19.
14. Rabotnikov V. S., Alshibaya M. M., Kovalenko O. A. i dr. Faktory riska hirurgicheskogo lecheniya ishemicheskoj bolezni serdca u zhenshchin // Grudnaya i serdechno-sosudistaya hirurgiya. - 1999. - №5. - S. 26-29.
15. SHabalkin B. V., ZHbanov I. V., Abugov A. M. Recidiv stenokardii posle aortokoronarnogo shuntirovaniya i veroyatnost' povtornoj revaskulyarizacii miokarda // Vestnik AMN SSSR. - 1990. - N. 10.- S. 6-10.
16. SHabalkin B. V., ZHbanov I. V. Vnutrennyaya grudnaya arteriya - osnovnoj transplantat dlya revaskulyarizacii miokarda // Annaly RNCKH RAMN. -1996. - №. 5. - S. 61-73.
17. SHabalkin B. V., ZHbanov I. V., Minkina S. M., Abugov S. A. "Bolezn'" autovenoznyh transplantatov - osnovnaya prichina recidiva stenokardii posle aortokoronarnogo shuntirovaniya //Grudnaya i serdechno-sosudistaya hirurgiya. - 1999. - №. 5. - S. 20-25.
18. Cooley D. A. Internal mammary coronary artery bypass: experience with 1000 cases // Texas Heart Inst. J. - 2001. - Vol. 10. - P. 223-224
19. Daly R. S., Mc Carty P. M., Orzulac T. A. et al. Histologic comparison of experimental coronary artery bypass grafts // J. Thorac. Cardiovasc. Surg. - 1989. - Vol. 96. - P. 19-29.
20. Grondin C. M., Meere C., Castonguay Y., Lepage G., Grondin P. Progressive and late obstruction of an aorto-coronary venous bypass graft // Circulation. - 1971. - Vol. 43, №5. - P. 698-702.
21. Haverich A; Cremer-J. Perspectives of operative myocardial revascularization–minimally invasive coronary bypass–an alternative? //Z-Kardiol. – 2008. 87 Suppl 2. P. 175-80
22. Lakkis N. M., Mahmarian J. J., Verani M. S. Exercise thallium-201 single photon emission computed tomography for evalution of coronary artery bypass graft patency // Am. J. Cardiol. - 2009. - Vol. 76, №3. - P. 107-111.

УЧАСТИЕ В XIV МЕЖДУНАРОДНОМ СЛАВЯНСКОМ КОНГРЕССЕ ПО ЭЛЕКТРОСТИМУЛЯЦИИ И КЛИНИЧЕСКОЙ ЭЛЕКТРОФИЗИОЛОГИИ СЕРДЦА «КАРДИОСТИМ», Г. САНКТ-ПЕТЕРБУРГ, РФ, 27-29 ФЕВРАЛЯ 2020 ГОДА

27-29 февраля 2020 года в г. Санкт-Петербург состоялся XIV Международный славянский конгресс по электростимуляции и клинической электрофизиологии сердца «Кардиостим». Одновременно работали XIV Всероссийский симпозиум «Диагностика и лечение аритмий у детей», XII Международный симпозиум «Электроника в медицине. Мониторинг, диагностика, терапия», VII Всероссийский симпозиум по проблеме диагностики и лечения диспластического сердца.

Конгресс является главным событием в области аритмологии, более 25 лет объединяя врачей кардиологов, рентгенэндоваскулярных хирургов, кардиохирургов, врачей функциональной диагностики, педиатров, физиков и математиков, занимающихся разработкой медицинского оборудования (стран СНГ, Центральной Азии и Европы).

Секции конгресса традиционно освещали широкий круг вопросов диагностики нарушений ритма сердца, стратификации риска, фармакотерапии, интервенционного лечения, использования имплантируемых устройств в лечении аритмий.

Параллельно научным секциям работала медицинская выставка, в рамках которой были организованы мастер-классы, сателлитные симпозиумы и практикумы по программированию имплантируемых устройств, картированию тахиаритмий, малотравматичному удалению имплантируемых электродов и т.д.

Участниками конгресса от ННЦХ им. А.Н. Сызганова стали заведующий отделения аритмологии и интервенционной кардиологии PhD Баимбетов А.К., врач аритмолог Байрамов Б.А., старший научный сотрудник и врач Бижанов К.А. Сотрудниками ННЦХ им. А.Н. Сызганова представлены 2 устных и 3 постерных доклада, демонстрирующие высокий уровень оказания медицинской помощи больным с нарушениями ритма сердца в Казахстане, а так же опыт лечения пациентов с пароксизмальной и персистирующей формой фибрилляции предсердий в нашем центре.

Тезисы докладов опубликованы в приложении к официальному журналу Всероссийского научного общества специалистов по клинической электрофизиологии, аритмологии и электрокардиостимуляции «Вестник аритмологии».

СТАЖИРОВКА В НАЦИОНАЛЬНОМ МЕДИЦИНСКОМ ИССЛЕДОВАТЕЛЬСКОМ ЦЕНТРЕ ИМ. В. А. АЛМАЗОВА НА ТЕМУ: «ЛЕЧЕНИЕ ПАЦИЕНТОВ С ПАРОКСИЗМАЛЬНОЙ ФОРМОЙ AFIB НА CARTO3 V6 С ИСПОЛЬЗОВАНИЕМ МОДУЛЯ CONFIDENSE» Г. САНКТ-ПЕТЕРБУРГ, РФ, 02.03.2020 - 04.03.2020 Г.

С 02.03.2020 по 04.03.2020 г. в НМИЦ им. В.А. Алмазова, проходила стажировка с участием сотрудников ННЦХ им. А.Н. Сызганова, на тему: «Лечение пациентов с пароксизмальной формой AFIB на Carto3 V6, с использованием модуля Confidense». Обсуждены методы лечения сложных форм аритмии, проведены показательные операции совместно с аритмологами нашего центра, которые в ходе работы продемонстрировали хорошее владение и понимание новейшей технологии картирования и абляции, системы Carto 3.

Атмосфера конференции и стажировки деловая, комфортная; впечатления от организации положительные. Планируется дальнейшее использование модуля «Confidense» в нашем центре для лечение сложных форм аритмии с высокой степенью эффективности.

МАСТЕР-КЛАСС «КАТЕТЕРНАЯ РАДИОЧАСТОТНАЯ АБЛАЦИЯ НАДЖЕЛУДОЧКОВЫХ ТАХИКАРДИЙ»

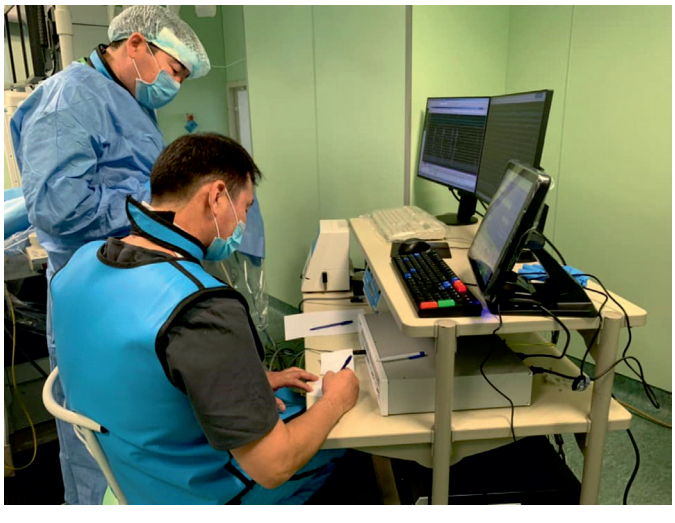
В г. Кызылорда в областной многопрофильной больнице был проведен мастер-класс «Катетерная радиочастотная абляция наджелудочковых тахикардий» по внедрению методики по интервенционному лечению аритмий сердца.

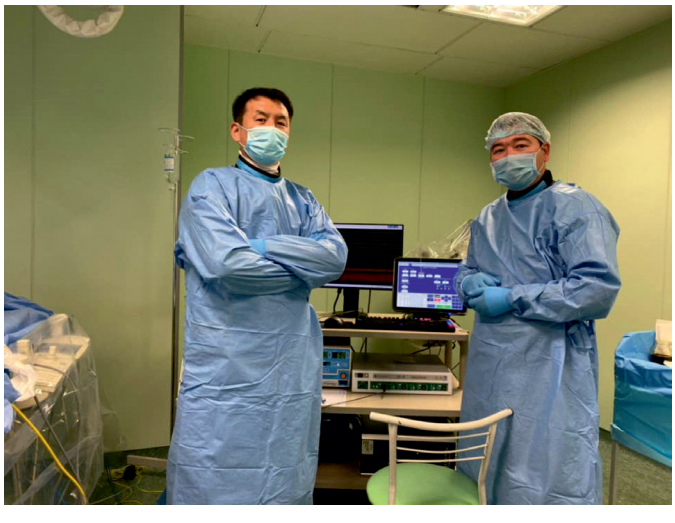
Мастер-класс проводил Баимбетов Адиль Кудайбергенович, зав.отд. рентгенохирургии, интервенционной кардиологии и аритмологии ННЦХ имени А.Н. Сызганова. Он является одним из ведущих аритмологов в Казахстане, и наставником аритмологов из Кызылорды.

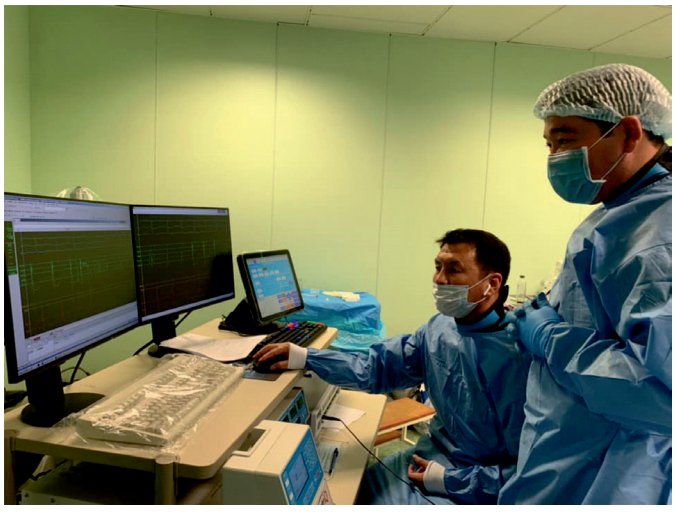
Катетерные методы лечения аритмии сердца с применением радиочастотной аблации в Кызылорде внедряются впервые. К этой методике местные врачи готовились не первый год. Они прошли обучение в ННЦХ им. А.Н. Сызганова и Адиль Кудайбергенович, как опытный специалист постоянно помогает кызылординским коллегам в освоении азов аритмологических операций. Они уже проводят на высоком уровне имплантации различных сердечных устройств, для лечения заболеваний сердца.

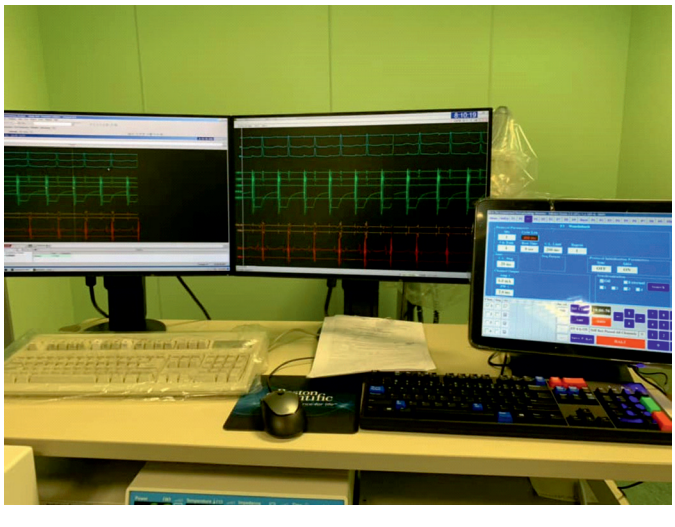
- «Теперь можно сказать, что в Кызылорде есть полноценный аритмологический центр, - говорит Баимбетов А.К. Наличие ЭФИ установки позволит коллегам, осваивать все виды катетерных аблаций. Все идет планомерно, как и должно быть: от простого к сложному, постепенно двигаясь к высоким технологиям в лечении сердечно-сосудистых заболеваний. Проведено 8 операций: в основном это наджелудочковые тахикардии. Все прошло успешно, без осложнений».

Пожелаем успехов и плодотворных работ коллегам в этом начинании!









КАЛИЕВА МИРА МАРАТОВНА

21 марта 2020 года на 57 году жизни скоропостижно скончалась Калиева Мира Маратовна – кандидат медицинских наук, доцент кафедры клинической фармакологии КазНМУ им. С.Д. Асфендиярова. С 2015 года являлась клиническим фармакологом ННЦХ им. А.Н. Сызганова.

В 1990 году Калиева М.М. окончила педиатрический факультет Алматинского Государственного медицинского института.

С 1990 по 1992 год прошла клиническую интернатуру на базе детской клинической базы №1 г. Алматы и до 1993 года работала детским участковым врачом детской поликлиники №16.

1993-1998 гг. – ассистент кафедры клинической фармакологии КазНМУ.

В 2003 году успешно защитила кандидатскую диссертацию по специальности 14.00.25 – фармакология, клиническая фармакология.

В 2015 году окончила магистратуру в Санкт-Петербургском Гуманитарном Университете профсоюзов по специальности «Психология».

С февраля 2006 г. по настоящее время работает доцентом на кафедре клинической фармакологии, врач-клинический фармаколог Каз НМУ им. С.Д. Асфендиярова.

Калиева М.М. - автор 30 статей и 2 учебно-методических рекомендаций для студентов, соавтор 100 клинических протоколов Министерства здравоохранения РК по взрослой и детской хирургии, детской и взрослой онкогематологии, неврологии, профессиональные заболевания. На базе АО «Национальный научный центр хирургии» им. А.Н. Сызганова прошла аккредитацию по проведению клинических исследований лекарственных препаратов и изделий медицинского назначения.

Имеет сертификат GSP Основы надлежащей клинической практики.

Является модератором проведения 4 фазы клинического исследования препарата « Рубуфин».

Участвовала в проведении тренингов по внедрению клинических протоколов в образовательный процесс и в практическое здравоохранение РК в г. Алматы, Алматинской области, г. Таразе, г. Шымкенте.

Является научным консультантом докторанта на соискание академической степени Ph.D. на тему: «Персонализированный подход к рациональной фармакотерапии язвенной болезни желудка с учетом генотипирования».

Прошла обучение семинар «Инновационные технологии в медицинском образовании», прошла повышения квалификации преподавателей в АГИУВ по циклу «Актуальные вопросы клинической фармакологии рациональной фармакотерапии» (156 часов).

Награды: Почетная грамота Министра Здравоохранения РК (2017 г.), Почетная грамота Министра Образования и науки РК (2018 г.).

Светлая память о Мире Маратовне Калиевой навсегда останется в сердцах её учеников и коллег. Редакционная коллегия журнала «Вестник хирургии Казахстана» и коллектив ННЦХ им. А.Н. Сызганова глубоко скорбит по поводу скоропостижной кончины Калиевой Миры Маратовны и приносят свои глубокие соболезнования родным и близким.

Редакционная коллегия журнала «Вестник хирургии Казахстана»,

коллектив ННЦХ им. А.Н. Сызганова

К 70-ЛЕТНЕМУ ЮБИЛЕЮ СЕЙСЕМБАЕВА МАНАСА АХМЕТЖАРОВИЧА

Сейсембаев Манас Ахметжарович окончил в 1973 году Семипалатинский Государственный медицинский институт по специальности «Лечебное дело» с присвоением квалификации «врач».

С 1973 года по 1974 год прошел интернатуру по хирургии в Усть-Каменогорске. С 1974 по 1977 год работал в районной больнице хирургом с 1977 года работал в Республиканском клиническом Госпитале ИОВ хирургом, а затем заведующим хирургического отделения.

С 1980 года работал в Казахском НИИ Клинической и экспериментальной хирургии им. А.Н. Сызганова младшим научным сотрудником, с 1981 года переведен и утвержден старшим научным сотрудником отделения хирургии печени, желчных путей и поджелудочной железы. С 1991 года по 2001 год руководил отделением хирургии печени, а затем был назначен на должность директора.

В 2003 году был назначен начальником Республиканского клинического госпиталя инвалидов отечественной войны, в 2010 году был назначен генеральным директором и в 2011 году был избран Председателем Совета директоров АО «Национальный научный центр хирургии им. А.Н. Сызганова».

В 1988 году защитил кандидатскую диссертацию, в 1996 году присуждена ученая степень доктора медицинских наук. В 1997 году присвоено ученое звание профессора медицины. Имеет более 157 научных статей, опубликованных в ведущих научных журналах Казахстана, России. Автор более 250 научных работ, 4 монографии и методических руководств, 65 авторских свидетельств на изобретения. Под руководством Сейсембаева М.А. защищены 4 докторских и 12 кандидатских диссертаций. Опубликовано 4 монографии, получены патенты на 24 изобретения. Владеет техникой сложных оперативных вмешательств, выполняет расширенные и комбинированные операции в соответствии с современными мировыми стандартами.

Профессор Сейсембаев М.А. является организатором и активным участником научных конференций, проводимых в республике Казахстан, странах СНГ и дальнего зарубежья. Он обладает высокими качествами, характеризующие его как руководителя и прекрасного и грамотного специалиста-честность, ответственность, аналитический склад ума,способность объективно оценивать ситуацию.

Практически реализует свой профессиональный опыт в процессе исполнения своих функциональных обязанностей. К исполнению функциональных обязанностей относится с большой ответственностью, подчиняет личные интересы интересам работы. Ясно и четко излагает свои мысли. Стремится к приобретению новых знаний и навыков. Осваивает новые виды деятельности, изучает и усваивает новую информацию, вежлив и тактичен с коллегами и пациентами. Активно делится своим опытом с коллегами.

Сейсембаев Манас Ахметжарович за трудовые заслуги награжден Почетной грамотой президента Республики Казахстан (1995), нагрудным знаком «Отличник здравоохранения Республики Казахстан» (2006), орденом им. Н.И. Пирогова МЗиСР Российской Федерации (2011), «Золотой медалью Казахстанской ассоциации эндоваскулярной хирургии» (2013), медалью «Еңбек ардагері» (2017).

Профессор Сейсембаев Манас Ахметжарович является Председателем РОО «Казахстанское общество хирургов», почетным членом Ассоциации хирургов-гепатологов стран СНГ.

В день славного юбилея профессора Сейсембаева М.А. коллектив ННЦХ им. А.Н. Сызганова и Казахстанского общества хирургов желает профессиональной молодости, творческих успехов, здоровья и благополучия!

Коллектив ННЦХ им. А.Н. Сызганова,

Казахстанское общество хирургов

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)

На сайте http://www.translit.ru/ можно бесплатно воспользоваться программой транслитерации Русского текста в латиницу, используя различные системы. Программа очень простая, ее легко использовать для готовых ссылок. К примеру, выбрав вариант системы Библиотеки Конгресса США (LC), мы получаем изображение всех буквенных соответствий. Вставляем в специальное поле весь текст библиографии на русском языке и нажимаем кнопку «в транслит».

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.

Официальный сайт журнала «Вестник хирургии Казахстана»: **www.vhk.kz**
E-mail: **kaz.vestnik@mail.ru**