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ASSESSMENT OF THE EFFECTIVENESS OF MEASURES TO PREVENT COMPLICATIONS OF SURGICAL TREATMENT IN PATIENTS WITH OCCLUSION OF THE AORTO-ILIAC SEGMENT

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Abstract

Introduction: In modern vascular surgery, occlusive lesions of the aortoiliac segment (AIS) represent one of the most pressing problems. It is generally accepted that the detection of AIS occlusion indicates the severity and prevalence of the atherosclerotic process, and therefore a high probability of combined occlusive lesions in other arterial basins. Of particular importance in this regard is the lesion of the arterial bed of vital organs – the heart and brain.

Objective. To conduct a comparative analysis of the results of surgical treatment of occlusive lesions of the AIS with and without correction of predictors of complications from vital organs, and to evaluate their effectiveness.

Materials and methods: Study design — prospective non-randomised clinical observation. The analysis included 143 patients with occlusive lesions of the aortoiliac segment (AIS) who underwent surgery in 2018–2024 in the cardiovascular surgery department of the NCJSC «Semey Medical University» University Hospital.

Depending on the tactics used, patients were divided into two groups: Group 1 (n = 64) — patients who underwent emergency reconstructive interventions on the AIS without prior correction of coronary and carotid artery lesions, without pelvic revascularisation, and without treatment for renal failure. Group 2 (n = 79) — patients who, if indicated, underwent preliminary correction of cardiac and cerebrovascular pathology, revascularisation of the pelvic arteries, and stabilisation of renal function before the main operation.

Results: In the early postoperative period (30 days), complications were recorded in 43.8% of patients in the first group and in 10.1% in the second group (p = 0.0002). Systemic complications (myocardial infarction, ACA stroke, multiple organ failure) were significantly more common in the first group (p < 0.01). The 30-day mortality rate decreased from 12% in the first group to 2.5% in the second. In the long term (5 years), the overall complication rate was 40.7% versus 11.5% (p = 0.0003). Cumulative Kaplan-Meier survival reached 80% in the first group and 95% in the second, with statistically significant differences (Log-Rank p = 0.029).

Conclusion: The implementation of this tactic not only improved the immediate results of treatment, but also significantly increased the long-term survival of patients. Comprehensive preoperative preparation aimed at correcting functional disorders of vital organs and optimising the staging of vascular interventions have proven their effectiveness and can be recommended as a safe and clinically justified method of treating occlusions of the aorto-iliac segment in patients with severe concomitant pathology.

Keywords: *Aorto-iliac segment occlusion, complications, mortality, survival.*

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Резюме

ОЦЕНКА ЭФФЕКТИВНОСТИ МЕР ПО ПРОФИЛАКТИКЕ ОСЛОЖНЕНИЙ ХИРУРГИЧЕСКОГО ЛЕЧЕНИЯ БОЛЬНЫХ С ОККЛЮЗИЕЙ АОРТО-ПОДВЗДОШНОГО СЕГМЕНТА

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Введение: В современной сосудистой хирургии окклюзионные поражения аорто-подвздошного сегмента (АПС), представляют одну из наиболее актуальных проблем. Общепринятым считается мнение, что обнаружение окклюзии АПС свидетельствует о тяжести и распространенности атеросклеротического процесса, а значит и большой вероятности сочетанных окклюзирующих поражений в других артериальных бассейнах. Особую важность в этом отношении представляет поражение артериального русла жизненно важных органов – сердца и головного мозга.

Цель исследования. Провести сравнительный анализ результатов оперативного лечения окклюзионных поражений АПС с коррекцией и без коррекции предикторов осложнений со стороны жизненно важных органов, оценить их эффективность.

Материалы и методы: Дизайн исследования — проспективное нерандомизированное клиническое наблюдение. В анализ включено 143 пациента с окклюзионными поражениями аорто-подвздошного сегмента (АПС), прооперированных в 2018–2024 гг. в отделении сердечно-сосудистой хирургии Университетского Госпиталя НАО «Медицинский университет Семей».

В зависимости от применённой тактики пациенты разделены на две группы: 1-я группа (n = 64) — больные которым выполнялись экстренные реконструктивные вмешательства на АПС без предварительной коррекции поражений коронарных и сонных артерий, без реваскуляризации тазового бассейна и без лечения почечной недостаточности. 2-я группа (n = 79) — пациенты, которым при наличии показаний предварительно выполнялась коррекция кардиальной и цереброваскулярной патологии, реваскуляризация тазовых артерий и стабилизация функции почек перед основной операцией.

Результаты: В раннем послеоперационном (30-дневном) периоде осложнения зарегистрированы у 43,8 % пациентов первой группы и у 10,1 % — второй (p = 0,0002). Системные осложнения (инфаркт миокарда, ОНМК, полиорганная недостаточность) достоверно чаще наблюдались в первой группе (p < 0,01). 30-дневная летальность снизилась с 12 % в первой группе до 2,5 % во второй. В отдалённом (5-летнем) периоде общая частота осложнений составила 40,7 % против 11,5 % (p = 0,0003). Кумулятивная выживаемость по Каплану–Майеру достигала 80 % в первой группе и 95 % во второй, различия статистически значимы (Log-Rank p = 0,029).

Заключение: Внедрение данной тактики позволило не только улучшить непосредственные результаты лечения, но и значительно повысить отдалённую выживаемость пациентов. Комплексная предоперационная подготовка, направленная на коррекцию функциональных нарушений жизненно важных органов, и оптимизация этапности сосудистых вмешательств доказали свою эффективность и могут быть рекомендованы как безопасный и клинически оправданный метод лечения окклюзий аорто-подвздошного сегмента у больных с тяжёлой сопутствующей патологией.

***Ключевые слова**: Окклюзия аорто-подвздошного сегмента, осложнения, летальность, выживаемость.*

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Түйіндеме

ҚОЛҚА-МЫҚЫН СЕГМЕНТІ ОККЛЮЗИЯСЫ БАР НАУҚАСТАРДЫ ХИРУРГИЯЛЫҚ ЕМДЕУДІҢ АСҚЫНУЛАРЫНЫҢ АЛДЫН АЛУ ЖӨНІНДЕГІ ШАРАЛАРДЫҢ ТИІМДІЛІГІН БАҒАЛАУ

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Кіріспе: Қазіргі тамырлы хирургияда қолқа-мықын сегментінің (ҚМС) окклюзиялық зақымдануы ең өзекті мәселелердің бірі. ҚМС окклюзиясын анықтау атеросклеротикалық процестің ауырлығы мен таралуын, демек, басқа артериялық бассейндерде біріктірілген окклюзиялық зақымданулардың үлкен ықтималдығын көрсетеді деген жалпы қабылданған пікір. Осыған байланысты өмірлік маңызды мүшелердің – жүрек пен мидың артериялық арнасының зақымдануы ерекше маңызды.

Зерттеудің мақсаты. Өмірлік маңызды мүшелер тарапынан асқынулардың болжаушыларын түзетумен және түзетусіз ҚМС окклюзиялық зақымдануларын жедел емдеу нәтижелеріне салыстырмалы талдау жүргізу, олардың тиімділігін бағалау.

Материалдар мен Әдістері: Зерттеу дизайны-проспективті рандомизацияланбаған клиникалық бақылау. Талдауға 2018-2024 жылдары "СМУ КеАҚ " университеттік госпиталінің жүрек-қан тамырлары хирургиясы бөлімінде ота жасалған қолқа-мықын сегментінің (ҚМС) окклюзиялық зақымдануы бар 143 пациент енгізілді. Қолданылатын тактикаға байланысты науқастар екі топқа бөлінеді: 1-ші топ (N = 64) — коронарлық және каротид артерияларының зақымдануын алдын ала түзетусіз, жамбас бассейнінің реваскуляризациясынсыз және бүйрек жеткіліксіздігін емдеусіз ҚМС-не шұғыл реконструктивтік араласулар жасалған науқастар. 2-ші топ (N = 79) — көрсетілімдер болған кезде алдын ала жүрек және цереброваскулярлық патологияны түзету, жамбас артерияларын реваскуляризациялау және негізгі ота алдында бүйрек қызметін тұрақтандыру орындалған науқастар.

Нәтижелер: ерте операциядан кейінгі (30 күндік) кезеңде асқынулар бірінші топтағы пациенттердің 43,8%-тіркелген және 10,1 % — екіншісінде (p = 0,0002) тіркелді. Жүйелік асқынулар (миокард инфарктісі, ми қан айнылымының жедел бұзылысы, көп мүшелік жеткіліксіздік) бірінші топта жиі байқалды (p < 0,01). 30 күндік өлім бірінші топтағы 12% - дан екінші топтағы 2,5% - ға дейін төмендеді. 5 жылдық кезеңде асқынулардың жалпы жиілігі 11,5% - ға қарсы 40,7 % құрады (p = 0,0003). Каплан-Майердің жиынтық өмір сүру деңгейі бірінші топта 80%-ға, ал екінші топта 95% - ға жетті, айырмашылықтар статистикалық маңызды (Log-Rank p = 0,029).

Қорытынды: бұл тактиканы енгізу емдеудің тікелей нәтижелерін жақсартып қана қоймай, науқастардың қашықтықтан өмір сүруін едәуір арттырды. Өмірлік маңызды органдардың функционалдық бұзылыстарын түзетуге және тамырлы араласулардың кезеңділігін оңтайландыруға бағытталған кешенді операция алдындағы дайындық тиімділігі дәлелденді және ауыр қатар жүретін патологиясы бар науқастарда қолқа-мықын сегментінің окклюзиясын емдеудің қауіпсіз және клиникалық негізделген әдісі ретінде ұсынылуы мүмкін.

Түйін сөздер*: қолқа-мықын сегментінің окклюзиясы, асқынулар, өлім, өмір сүру.*

Дәйексөз үшін:

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Introduction

Occlusive lesions of the aortoiliac segment (AIS) are a significant clinical problem because they cause severe ischaemia of the lower extremities and impair patients' quality of life. In recent decades, surgical treatment, including open reconstructive surgery and endovascular techniques, has become more accessible, but the risk of complications and unstable long-term outcomes remains high, especially in severe forms of the disease. Endovascular techniques demonstrate high technical success and satisfactory patency rates, especially in groups with less extensive lesions or TASC II A/B, but also in severe cases [7].

Despite the high level of development of vascular surgery, surgical interventions on the aorto-iliac segment are still accompanied by the risk of serious complications. The most significant of these are acute cerebrovascular accidents (ACVA), myocardial infarction, and acute renal failure. These complications are caused by both the severe somatic burden of patients and the characteristics of surgical intervention, which includes significant trauma, tissue ischaemia, the use of aortic clamping and contrast agents in intraoperative diagnostics. The high frequency of these complications requires careful preoperative risk assessment, optimisation of the patient's condition, and the use of modern methods of perioperative monitoring and protection of target organs.

Traditionally, treatment of occlusion of the aortoiliac segment is performed by open surgery, including endarterectomy and aortoiliac or aortofemoral bypass grafting. Although these methods have demonstrated excellent long-term patency, they are associated with high morbidity and mortality rates [3].

Currently, there is a pressing issue regarding the choice of surgical treatment tactics for occlusive lesions of the AIS, the necessity and priority of surgical correction of combined lesions of the coronary bed and carotid arteries, improvement of pelvic blood supply, and correction of renal failure. According to the literature, some authors prefer to perform simultaneous surgical interventions in two or more affected arterial basins, while others suggest performing staged interventions. There are also opinions on the advisability of therapeutic correction of blood supply disorders in affected organs [4,5].

Research objective. To conduct a comparative analysis of the results of surgical treatment of occlusive lesions of the AIS with and without correction of predictors of complications affecting vital organs, and to evaluate their effectiveness.

Materials and methods.

Study design: prospective non-randomised clinical study.

This study analyses the results of surgical treatment of 143 patients with occlusive lesions of the aortoiliac segment (AIS) operated on between 2018 and 2024 at the cardiovascular surgery department of the University Hospital of the NCJSC 'SMU'. Depending on the chosen treatment tactics, patients were divided into two groups.

The first group included 64 patients with unstable disease who, upon admission, presented with critical ischaemia of the lower extremities with a high probability of developing irreversible trophic disorders, including gangrene. Due to the urgency of their condition, these patients underwent emergency surgery without prior correction of haemodynamically significant lesions of the coronary and carotid arteries, without staged revascularisation of the pelvic basin, and without planned treatment for renal failure.

The second group included 79 patients who, if indicated, underwent preliminary correction of coronary and carotid artery pathology, as well as revascularisation of the pelvic arteries and stabilisation of renal function prior to the main AIS intervention.

The sample size was calculated using PASS 2000 software, version 12.0.4.

Inclusion criteria: occlusive lesions of the AIS, elective or emergency surgery, open reconstruction of the AIS.

Exclusion criteria: juxtarenal and intrarenal occlusions of the AIS, abdominal aortic aneurysm, emergency surgery, endovascular prosthetics of the AIS.

The study was conducted in accordance with the ethical principles of the Declaration of Helsinki and was approved by the local ethics committee of the Semey Medical University (protocol No. 4 of 27 September 2017).

In the preoperative period, in addition to physical examination, assessment of angiological status and laboratory tests, various instrumental diagnostic methods were used. Particular attention was paid to identifying concomitant pathology and combined lesions of vascular basins. As part of a comprehensive examination, electrocardiography (ECG), echocardiography (EchoCG), ultrasound Dopplerography and duplex scanning of blood vessels, multispiral CT angiography (MSCT-A), and, if indicated, coronary angiography were performed.

The cause of AIS occlusion in the study groups was atherosclerosis.

Statistical analysis. Intergroup comparison of quantitative characteristics was performed using the Mann-Whitney U test. Frequency indicators in independent samples were compared using Fisher's exact test. Differences were considered statistically significant at $p < 0.05$. Survival analysis was performed using the Kaplan-Meier method and the Log-Rank statistical test. Values of $p < 0.05$ were taken as the criterion for statistically significant differences.

Most patients in both groups had various comorbidities (Table 1).

Table 1.

Comorbidities in patients in the study groups.

Associated pathology	Group 1 (n=64)	Group 2 (n=79)
Ischemic heart disease (IHD)	56 (87,5%)	64 (81,0%)
Post-infarction cardiosclerosis (PICS)	13 (20,3%)	17 (21,5%)
Cerebral circulation disorders	36 (56,3%)	38 (48,1%)
Acute cerebrovascular accident	6 (9,4%)	8 (10,1%)
Chronic obstructive pulmonary disease	8 (12,5%)	6 (7,6%)
Arterial hypertension (AH)	48 (75,0%)	62 (78,5%)
Chronic gastritis	38 (59,4%)	40 (50,6%)
Chronic kidney disease (CKD)	21 (32,8%)	20 (25,3%)
Chronic cholecystitis	8 (12,5%)	7 (8,9%)
Diabetes mellitus (DM)	5 (7,8%)	4 (5,1%)

As we can see from this table, the most prevalent pathologies were ischaemic heart disease, arterial hypertension, and cerebral circulation disorders. At the same time, the least common comorbidities in both groups were diabetes mellitus, chronic cholecystitis, COPD, and ACVA.

Patients in both groups underwent surgical interventions on the AIS, but patients in group 2 initially underwent correction of concomitant diseases.

An analysis of the surgical interventions performed in the second group is presented in Table 2.

Table 2.

Analysis of operations performed in the second group of patients.

Stages of operations	Absolute number (%) n = 79
ACBG → reconstruction of AIS	43 (54,4%)
PTCA with stenting → reconstruction of the AIS	18 (22,8%)
CEA → reconstruction of the AIS	12 (15,2%)
PTCA with stenting of the right coronary artery, PTCA with PTCA with stenting of the ICA → reconstruction of the AIS	2 (2,53%)
PTCA with stenting stent of the ICA → ACBG → reconstruction of the AIS	2 (2,53%)
ACBG → КЭАЭ → reconstruction of the AIS	2 (2,53%)

Note: AIS – aorto-iliac segment
ACBG – aorto-coronary bypass grafting *PTCA – percutaneous transluminal coronary angioplasty*
CEA – carotid endarterectomy *RCA – right coronary artery*
PTA – percutaneous transluminal angioplasty *ICA – internal carotid artery.*

The table reflects the stages and types of surgical interventions performed in patients with aortoiliac segment (AIS) lesions in a group of 79 people. The most frequently used tactic was aortocoronary bypass grafting (ACBG) followed by AIS reconstruction, which was observed in 43 patients (54.4%).

The next most common procedures were: percutaneous transluminal coronary angioplasty (PTCA) with stenting followed by AIS reconstruction — in 18 patients (22.8%), carotid endarterectomy (CEA) before AIS reconstruction — in 12 patients (15.2%). Less common were complex combined approaches involving stenting of several vascular beds at once (ICA), as well as multi-stage interventions involving ACBG and CEA, each of which accounted for 2 cases (2.53%). The types of surgical interventions on the AIS are presented in Table 3.

Table 3

Comparative analysis of AIS reconstruction.

Type of reconstruction	Absolute number (%)	
	Group 1 (n=64)	Group 2 (n=79)
Bifurcated aorto-femoral bypass grafting	57 (89,06%)	53 (67,1%)
Bifurcation aorto-femoral bypass grafting with revascularization of the internal iliac artery	-	26 (32,91%)
Linear aorto-femoral bypass	7 (10,94%)	8 (10,13%)

The table reflects the distribution of types of reconstructive interventions on the aorto-iliac segment in patients from the two study groups (group 1 — 64 patients, group 2 — 79 patients). The most frequently used method in both groups was bifurcation aorto-femoral bypass surgery: in 57 patients (89.1%) in group 1 and 61 patients (77.2%) in the second group. A modified technique was also used in the second group — bifurcation aorto-femoral bypass grafting with revascularisation of the internal iliac artery, performed in 10 patients (12.7%). This technique was not used in the first group. This technique was invented as part of scientific work carried out under a PhD programme. Patents for the invention were obtained: No. 34009 dated 13 August 2018 and No. 34010 dated 13 August 2018. This technique is described in more detail in our article 'Prevention of complications of surgical treatment of patients with occlusion of the aorto-iliac segment' [2].

Linear aorto-femoral bypass grafting was used in 7 patients (10.9%) in the first group and in 8 patients (10.1%) in the second group.

Results

The results of treatment were studied in the 30-day and 5-year postoperative periods. The evaluation criteria in the 30-day postoperative period were restoration of blood flow in the lower extremities, adequacy of blood circulation in the affected areas, function of vital organs after surgery, blood and urine test results, restoration of intestinal peristalsis, integrity and healing of postoperative wounds (Table 4).

The table shows data on the development of both systemic and local complications in patients in the two study groups (group 1 — 64 patients, group 2 — 79 patients) after reconstruction of the aortoiliac segment (AIS). Systemic complications in group 1 developed in 18 patients (28.1%), while in group 2 they developed in only 2 patients (2.5%). The most common complications in the first group were acute cerebrovascular accident (7.8%), acute renal failure (6.3%), myocardial infarction (4.7%), pneumonia (4.7%) and multiple organ failure (4.7%). In group 2, only isolated cases of acute renal failure and multiple organ failure (1.3% each) were recorded. The difference in the overall frequency of systemic complications and the total number of complications between the groups is statistically significant — p = 0.0006 and p = 0.0002 (according to Fisher's exact test).

Local complications were less common in both groups: in group 1, they occurred in 10 patients (15.6%), and in group 2, in 6 patients (7.6%). The most common complications were lymphorrhea (6.3% and 3.8%, respectively) and gangrene of the lower extremities (4.7% and 2.5%).

Table 4.

Complications in the 30-day postoperative period.

Type of complication	Absolute number (%)		p
	Group 1 n=64	Group 2 n=79	
Systemic			
Myocardial infarction	3	-	p = 0,07
Acute cerebrovascular accident	5	-	p = 0,02
Acute renal failure	4	1	p = 0,19
Pneumonia	3	-	p = 0,07
Multiple organ failure	3	1	p = 0,35
Total	18	2	**p = 0,0006**
Local			
Prosthetic limb thrombosis	2	1	p = 0,60
Gangrene of the lower limb	3	2	p = 0,67
Eventration of abdominal organs, relaparotomy	1	-	p = 0,46
Lymphorrhea	4	3	p = 0,70
Total	*10*	6	p = 0,28
Total number of complications	*28*	8	**p = 0,0002**

Complications in the 30-day postoperative period in patients in group 1 led to death in 5 (7.81%) cases. The causes of death were acute myocardial infarction (AMI) – 2 (3.13%) patients, acute cerebrovascular accident (ACVA) – 1 (1.56%) patient, acute renal failure (ARF) – 1 (1.56%) patient, and multiple organ failure – 1 (1.56%) patient. In the second group of patients, early postoperative complications caused death in 1 (1.27%) patient with progressive multiple organ failure.

In the long term, the functioning of the vascular prosthesis, blood supply to the lower extremities, the condition of anastomoses and postoperative wounds, as well as blood circulation in the arterial basins of vital organs were assessed. Long-term follow-up results, ranging from 6 months to 5 years, were obtained for 59 patients (92.2%) in the first group and 78 patients (98.7%) in the second group (see Table 5).

Table 5.

Complications in the long term.

Type of complication	Absolute number (%)		p
	Group 1 n=59	*Group 2* n=78	
Systemic			
Myocardial infarction	5 (8.5%)	2 (2.6%)	p = 0.15
Acute cerebrovascular accident	3 (5.1%)	1 (1.3%)	p = 0.32
Acute renal failure	3 (5.1%)	2 (2.6%)	p = 0.66
Oncological pathology	1 (1.7%)	-	p = 0.43
Multiple organ failure	4 (6.8%)	1 (1.3%)	p = 0.16
Chronic ischemic colitis	2 (3.4%)	-	p = 0.20
Total	18 (30.5%)	6 (7.7%)	**p < 0.001**
Local			
Failure of aortofemoral prosthetic anastomosis with formation of a false aneurysm	4 (6.8%)	2 (2.6%)	p = 0.41
Postoperative ventral hernia	2 (3.4%)	1 (1.3%)	p = 0.59
Total	6 (10.2%)	3 (3.8%)	p = 0.19
Total number of complications	24 (40.7%)	9 (11.5%)	**p = 0.0003**

Analysis of postoperative complications showed that the total number of complications in group 1 (n=59) was significantly higher than in group 2 (n=78).

Thus, complications developed in 24 patients (40.7%) in the first group versus 9 patients (11.5%) in the second group, which is a statistically significant difference (p = 0.0003).

Complications in the long term in patients in group 1 led to death in 7 (9.4%) patients: the cause of death in 3 (3.8%) cases was myocardial infarction, 2 (1.9%) patients died from stroke, in 1 (1.9%) case the patient died from oncological pathology, and in 1 (1.9%) case the cause of death was progressive renal failure. In the second group of patients, fatal complications developed in the long term in 2 (4.4%) patients: in 1 (2.2%) case, the cause was myocardial infarction, and in 1 (2.2%) patient, acute renal failure.

An analysis of patient survival during a 30-day observation period, performed using the Kaplan–Meier method, showed that already in the early postoperative period (the first 10–30 days), the survival curve for patients in group 1 declined significantly faster than in group 2. The difference between the curves is statistically significant according to the Log-Rank test (p ≈ 0.03), which confirms the worse early prognosis in group 1. (Figure 1).

An analysis of patient survival over a 5-year observation period, performed using the Kaplan-Meier method, showed significantly higher survival rates for patients in group 2 compared to group 1.

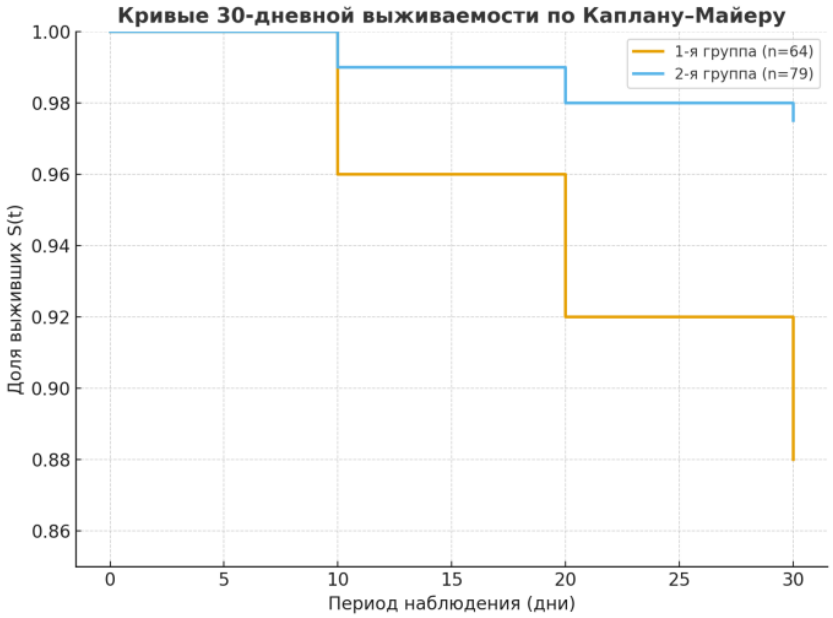

Figure 1. 30-day mortality.

By the fifth year of follow-up, cumulative survival was 80% in group 1 and 95% in group 2. Statistical analysis using the Log-Rank test (Mantel–Cox) revealed significant differences between survival curves ($\chi^2 = 4.76$; $p = 0.029$), indicating a significant impact of the nature of treatment on the long-term prognosis of patients. (Figure 2).

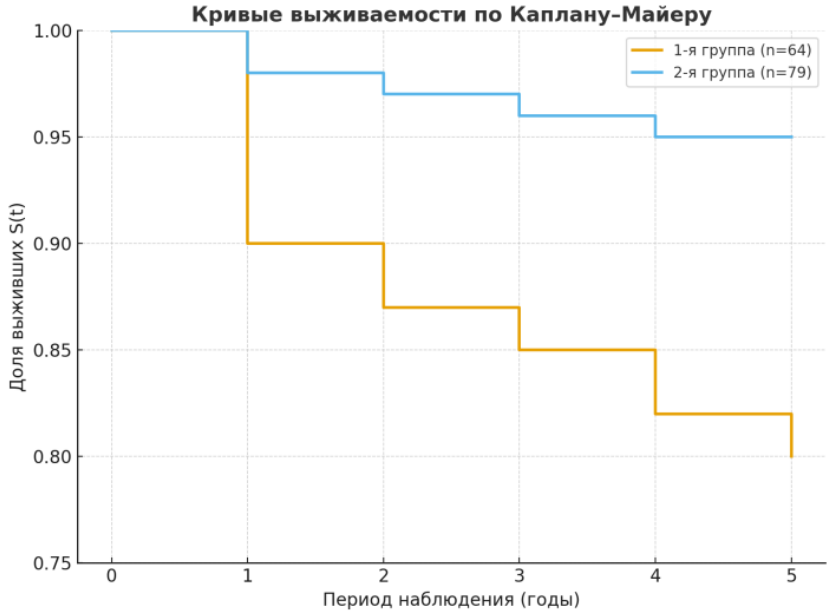

Figure 2. Five-year survival rate.

Discussion

The results of the study demonstrate significant differences in the frequency of postoperative complications and survival rates between the compared groups of patients.

Analysis in the early 30-day postoperative period showed that complications developed significantly more often in patients in group 1 (43.8%) than in patients in group 2 (10.1%; $p = 0.0002$). The largest contribution to the structure of complications was made by systemic disorders — myocardial infarction, acute cerebrovascular accident, acute renal failure, and multiple organ failure. These conditions had a direct impact on early mortality, as confirmed by a decrease in 30-day survival to 88% in group 1 compared to 97.5% in group 2.

In the long term (five years), the trend continued: complications were recorded in 40.7% of patients in group 1 and in 11.5% in group 2 ($p = 0.0003$). The main causes of adverse outcomes were progression of cardiovascular disease, multiple organ failure, and recurrence of lower limb ischaemia. The cumulative 5-year Kaplan-Meier survival rate was 80% in group 1 versus 95% in group 2, with statistically significant differences according to the Log-Rank criterion ($p = 0.029$).

These results confirm that the initial functional status of patients and the characteristics of the surgical procedure performed are key factors determining the prognosis. The higher level of complications in group 1 can be explained by the greater prevalence of concomitant diseases (coronary heart

disease, chronic renal failure) and the technical complexity of the operations.

In patients in group 2 who received comprehensive treatment with optimised perioperative management, there was a significant reduction in both early and late complications, which led to better survival rates.

The results are consistent with data from the literature, which reports that the combined use of modern vascular reconstruction methods, early mobilisation of patients, and individualised anticoagulant therapy contribute to improved long-term outcomes and reduced mortality. In addition, the data obtained confirm the need for strict control of risk factors — arterial hypertension, dyslipidaemia, diabetes mellitus, and smoking — which is especially important for the prevention of recurrent vascular events. [1,6].

Conclusions

The study showed that a comprehensive approach, including preliminary correction of cardiac, cerebrovascular and renal disorders, as well as restoration of pelvic blood circulation, reduces the incidence of systemic complications and mortality in the early and distant postoperative periods during open surgical treatment of occlusions of the aortoiliac segment. In the early (30-day) postoperative period, the frequency of complications decreased from 43.8% in the first group to 10.1% in the second ($p = 0.0002$), which was accompanied by a decrease in 30-day mortality from 12% to 2.5%. In the long-term (5-year) follow-up period, the overall complication rate decreased from 40.7% to 11.5% ($p = 0.0003$), with a five-year cumulative survival rate according to the Kaplan–Meier method of 80% in the first group and 95% in the second group.

Thus, the implementation of this tactic has not only improved immediate treatment outcomes, but also significantly increased long-term patient survival. Comprehensive preoperative preparation, aimed at correcting functional disorders of vital organs, and optimisation of the stages of vascular interventions have proven their effectiveness and can be recommended as a safe and clinically justified method of treating occlusions of the aorto-iliac segment in patients with severe concomitant pathology.

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