



THE RESULTS OF SURGICAL CORRECTION OF PATIENTS WITH CORONARY ARTERY DISEASE COMPLICATED BY A VIOLATION OF THE CONTRACTILE ABILITY OF THE MYOCARDIUM.

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Article history:	Abstract:
<p>Received: April 4th 2023 Accepted: May 6th 2023 Published: June 6th 2023</p>	<p>INTRODUCTION. Ischemic heart disease still remains the dominant pathology among diseases of the cardiovascular system. Surgical revascularization of the myocardium is known to be the most radical way of treating patients with ischemic heart disease [3,4,7]. Due to the progression of percutaneous interventions, the contingent of cardiac surgery patients has changed markedly. To date, the number of patients with the so-called compromised distal bed has increased. Among the candidates for open myocardial revascularization, the percentage of complicated forms of coronary artery disease has increased: acute coronary syndrome, postinfarction cardiosclerosis, dysfunction of the valvular apparatus of the heart of ischemic genesis, decompensated heart failure. The expansion of indications for PCI led to an increase in the percentage of complicated forms of coronary heart disease in the structure of morbidity among candidates for surgery: pronounced decompensation of CHF, dysfunction of the valvular apparatus of ischemic genesis, acute coronary syndrome, extensive cicatricial changes of the myocardium. Patients with severe concomitant pathology increase accordingly: generalized atherosclerosis of the aorta and its branches, cerebrovascular disease, diabetes mellitus, malignant course of arterial hypertension (AH) with damage to target organs, respiratory failure, renal failure.</p> <p>Currently, the surgical tactic for coronary artery disease is open complete myocardial revascularization, in which all affected coronary arteries are shunted. Patients need to be hospitalized and prepared to assess the quality of performed coronary artery stenting, mammary – coronary, aorto–coronary bypass surgery by endovascular methods. Ultrasound and electromagnetic flowmetry makes it possible to conditionally assess the effectiveness of myocardial revascularization by measuring the blood flow velocity through shunts. Intraoperative coronary bypass grafting could be a way to assess the effectiveness and reliability of the formed anastomoses. This technique makes it possible to visualize perfusion sites through each formed shunt as anastomoses are performed and to determine the filling of pools through intra and intersystem collaterals, as well as to evaluate the quality of formed anastomoses in real time. Thus, adequate myocardial revascularization can be achieved by restoring blood flow throughout the myocardium. Perfusion scintigraphy of the myocardium is an alternative method of examining the quality of myocardial revascularization, which can also be performed on an outpatient basis.</p>

Keywords: coronary heart disease, coronary bypass surgery, low contractile capacity of the myocardium.

PURPOSE OF THE STUDY. The aim of the work is to assess the quality and effectiveness of myocardial revascularization in the early postoperative period, to assess the patency and functional viability of mammary-coronary and coronary artery shunts.

MATERIAL AND METHODS. The work is based on a retrospective analysis of the results of surgical

treatment of 236 patients with coronary heart disease who were in the department of HLIBS and its complications of our center over the past year. 236 patients with severe stenosing atherosclerosis of the coronary arteries were operated on. Female patients comprised 78 people (33%), male 158 people (67%). The age ranged from 40 to 72 years, the average age was 55 + 8 years. All patients had a long ischemic



history, suffered one or more myocardial infarctions. 219 patients had angina of functional classes II - III, 13 patients had unstable angina, 4 patients had angina of functional class IV. 228 patients had concomitant pathology – hypertension, 62 patients – type II diabetes mellitus, a state of drug subcompensation.

RESEARCH RESULTS AND DISCUSSION. All patients in the preoperative period were collected anamnesis data and patient complaints, examinations: electrocardiogram, Holter monitoring, selective coronary ventriculography and shuntography, EchoCG before and after the surgical period, load – rest to assess the perfusion and contractility of the myocardium and differentiation of the nature of its lesion (ischemia, hibernation, scar) in hypoperfused areas. According to EchoCG data in the preoperative period, the average LV BWV was 160.5 + 45 ml, the average LV EF was 47.8 + 5.6% (Table 1).

Table 1
Characteristics of patients

Indicator	Number and proportion of patients
Transferred large	focal Q - IM 45 (28 %)
Transferred small	focal non-Q - IM 141 (85.1 %)
Angina of tension: FC II – III FC IV	219 (75,0 %) 2 (1,5 %)
Type II diabetes mellitus	62 (27%)
Hypertension	228 (69.1 %)
Postinfarction LV aneurysm	16 (6.2 %)
Ejection fraction (EF)	47.8 + 5.6 %
Of course-systolic volume (CSV)	62.8 + 6.2 %
Of course-diastolic volume (CDV)	160.5 + 45 %

Localization of hypoperfusion foci coincided in all patients with angiographic data. In all segments of the anterior wall and apex, the lesion in area was noted in 100% of cases, in the segments of the lower wall from 19 to 42%, in the side walls from 32 to 47%, in the septum segments from 53 to 75%. According to coronary angiography, three-vessel lesion – 81%, diffuse lesion of the right coronary artery - 34.6%, subtotal stenosis of the LCA trunk – 23%, proximal

stenosis of the right coronary artery – 21.4%. All surgical interventions were performed under conditions of artificial circulation and pharmacohologic cardioplegia, using multicomponent anesthesia. All affected coronary arteries have been shunted. When performing coronary bypass surgery, 14 patients received 4 shunts, 131 patients received 3 shunts, 82 patients received 2 shunts, and 9 patients received 1 shunt. The anterior interventricular branch of the left coronary artery was shunted in 92% of patients, the right coronary artery – in 66% of patients. The circumflex branch of the left coronary artery was shunted in 49% of patients, the diagonal branch of the left coronary artery – in 43% of patients, the intermedia artery – in 27% of patients (Table 2). The total number of shunts per patient was 3.1 + 0.7.

Table 2

Bypass coronary artery	Anterior interventricular artery n (%)	Right coronary artery n (%)	Envelope branch n (%)	Diagonal branch n (%)	Artery intermedia n (%)
Number of distal anastomoses	217 (92 %)	155 (66%)	115 (49 %)	101 (38 %)	63 (27 %)

On average, on the 4th – 5th day in the postoperative period, control echocardiography was performed (Table 3). According to the results of EchoCG, after the performed surgery, an improvement in the dynamics of left ventricular contractility was noted. Noted an increase in LVEF to 51.3 + 4.5, a decrease in CSV by 17% (130.4 + 31 ml).

Table 3

Indicator, unit	before surgery (n = 90)	after the operation (n = 90)	P
CSV, ml	160,5 ± 45	130, 4 ± 31	P < 0,001
FE, %	47,8 ± 5,6	51,3 ± 4,5	P < 0,001

CONCLUSION. One of the most reliable methods of studying the assessment of myocardial blood supply at the level of microcirculation is myocardial perfusion



scintigraphy (PSM). According to the PSM data, in the presence of a sufficient amount of hibernated myocardium, there is a decrease in the decrease in perfusion defect by $14.2 \pm 5.7\%$. Perfusion scintigraphy of the myocardium is a radioisotope research method designed to assess the blood supply of the myocardium at the level of microcirculation. The method is based on the assessment of the distribution of intravenously administered radiopharmaceutical (RFP) in the heart muscle, which is included in intact cardiomyocytes in proportion to coronary blood flow.

Areas of the myocardium with normal blood supply create a picture of a uniform distribution of RFP, and areas of the myocardium with a relative or absolute decrease in blood flow due to ischemia or scar damage have a decrease in the inclusion of RFP due to perfusion defects. The distribution of RFP in the myocardium depends both on the perfusion itself and on the integrity of the sarcolemma and the preservation of cellular metabolism.

To date, the perfusion scintigraphy method has already firmly entered clinical practice in our department, and is used in the preoperative and postoperative period in patients. Improvement of myocardial perfusion was noted in all patients with coronary artery disease after coronary artery bypass grafting according to scintigraphy.

ACKNOWLEDGEMENT. In patients with scarring of a significant part of the myocardium and an initially low ejection fraction, the most effective method of myocardial revascularization is coronary bypass surgery. In patients with coronary artery disease, noninvasive diagnostic methods have a high degree of reliability in determining the patency and functional viability of coronary shunts. In patients with a viable dysfunctional myocardium, one of the methods of myocardial revascularization should be performed – percutaneous balloon coronary angioplasty with stenting or coronary artery bypass grafting.

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