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Modern Methods of Surgical Treatment of Heart Diseases on the Example of Cardiac Surgery for Chd

[1]Paskhin Igor Vasilevich, [2]Gazaliev Abdul-Bakiei Borzkhadzhievich, [3]Alekseeva Tatiana Dmitrievna, [4]Kaibov Akim Kamilovich

Abstract--*cardiac surgery is understood as the treatment of acquired or congenital heart defects by surgery. This article considers cardiac surgery as the only option of this method of treatment of coronary heart disease (CHD) and its complications in severe cases.*

To date, there are three types of treatment for CHD by surgical intervention: endovascular method, aorto-coronary bypass surgery and coronary stenting. The operation is aimed at improving blood flow in the ischemic heart. Additionally this operation can eliminate complications of IHD, such as an aneurysm, acute mitral valve insufficiency, the results of the infarction and infarct defects of the interventricular septum. From the above the most popular method is the aorto-coronary method bypass surgery, consisting of a bribe from the legs of a large subcutaneous area veins – it is from it that the shunt will be formed in the future. In most cases, coronary heart disease can be cured only by surgical method because in this case drug therapy is not available it is always effective.

This article describes the time spent in the department of cardiac surgery research on heart surgery for CHD coronary bypass surgery: the main stages of the operation, advantages of the method, observations and results in postoperative period.

Key words--*cardiac surgery, coronary heart disease , heart disease, surgery, heart, treatment method*

I. INTRODUCTION

Topic of cardiac surgery and methods of surgical treatment of the heart is very relevant at the moment. Although in recent decades medicine has achieved significant results, these years the level of cardiovascular diseases is steadily increasing. The main illnesses are ischemic heart disease (CHD), atherosclerosis, and hypertension disease and its complications, accompanied by disability and premature death.

In Russia, the death rate because of cardiovascular diseases is more than a million people a year. According to statistics, 1.5% of men develop myocardial infarction in age 40-60 years, in older men it develops up to 2% per year. Also the number of cases among young people and middle-aged people is increasing. Although the level of hospital mortality has decreased, the overall mortality from this pathology remains high: about 60%. Also it should be noted that in most cases, the fatal outcome occurs at the pre-hospital stage.

[1]*Yaroslav-the-Wise Novgorod State University, Institute of Medical Education*
[2]*FSBEI HE A.I. Yevdokimov MSMSU MOH Russia*
[3]*Saint Petersburg State Pediatric Medical University*
[4]*People's friendship university of Russia, E-mail id: artemss1888@mail.ru*

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According to research E. Shlyakhto a large prevalence of arterial hypertension is revealed in adult patients. In Europe, the number of patients with this diagnosis is 30%, similar situation can be observed in Russia. The arterial hypertension leads to ischemic heart disease, brain stroke, heart failure. The described circumstances determine the value of the implementation new technologies in cardiac surgery. [5]

The purpose of the work is to examine the indications and methods of conducting surgical treatment of coronary artery disease. Research problem:

1. To identify the indications and symptoms of CHD;
2. Consider the stages and features of conducting an operation in CHD;
3. Make observations and draw appropriate conclusions.

Much attention is being paid to the development of high-tech technologies in cardiac surgery – they will eventually simplify the existing ones methods and improve the quality of treatment. Not so long ago in order to eliminate life threatening arrhythmia they performed open-heart surgery. Today, radio frequency catheter ablation eliminates this pathology through access via a vein or arteries, and this operation is in every sense superior to surgery on the open heart.

Thanks to theoretical and experimental research, prior to the new technologies, there were methods of treatment more effective than, for example, in the previous century. Worldwide the main focus is on the fundamentals in the field of cardiac surgery. In Russia, the goal is also to preserve the potential fundamental research in a crisis.

II.PROCEDURE

Research on surgical treatment of coronary heart disease. The work was conducted in Moscow in the "Federal Scientific–Research Center" in the department of cardiac surgery. At the time of the work, a patient with CHD was prescribed surgery coronary bypass surgery. The patient had complaints about chest pain during exercise, shortness of breath, weakness, nausea, tachycardia and excessive sweating.

Based on the patient's medical history and literature data, you can note indications for surgery: myocardial revascularization, as well as indications for operations in any area of surgery, based on three pillars: the clinical picture of the disease, the anatomy of the lesion and the function of the organ and CHD.

To the main indications according to R. S. Goloshchapov-Aksenov surgical treatment can also include severe angina, resistant to drug therapy, although the severity is not always similar to the severity of coronary artery disease. The effectiveness of modern medical therapy is high, if it is possible to achieve a sharp decrease in the consumption of oxygen by the myocardium and the impact on a number of pathological links in the formation of the angina pectoris syndrome. [1]

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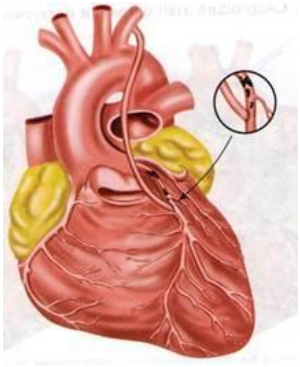

Pic.1 Chest anastomosis according to Kolesov

Main stages of the operation:

1) access to the heart, usually by median sternotomy;
2) isolation of internal thoracic artery; sampling of autovenous grafts performed byanother team of surgeons simultaneously with the production of sternotomy;
3) cannulation of the ascending part of the aorta and hollow veins and connecting of artificial blood supply;
4) compression of the ascending part of the aorta with cardioplegic arrest hearts;
5) overlap of distal anastomoses with coronary arteries;
6) Four removing the clip from the ascending part of the aorta;
7) prevention of air embolism;
8) restoration of cardiac activity;
9) the imposition of the proximal anastomosis;
10) disabling of artificial blood supply;
11) decannulation;
12) suturing a sternotomic incision with drainage of the cavity pericardium's.

The internal thoracic artery is isolated on a flap or skeletonize. (Pic. 2) The advantage of skeletonized internal thoracic artery is in its greater length. At the same time, when selecting the internal thoracic artery on the flap the risk of injury to the vessel wall is reduced. For convenience a special retractor is used to isolate the internal thoracic artery. For the purpose of withdrawal vascular spasm in the lumen of the internal thoracic artery enter a solution of Papaverine and envelop internal thoracic artery with a napkin moistened with Papaverine solution. Operation is carried out in conditions of moderately hypothermic artificial circulation (28-30°C). [2, p. 59] Advantages of the method:

- improved compatibility of the diameters of the internal thoracic and coronary arteries;
- anastomosis is applied between homogeneous tissues;
- due to the small diameter of the internal thoracic artery, the volume of the blood flow is less than that of an auto venous shunt, but the linear velocity is more, which should theoretically reduce the incidence of thrombosis;
- you only need to apply one anastomosis, which reduces the surgery time;
- the internal thoracic artery is rarely affected by atherosclerosis.

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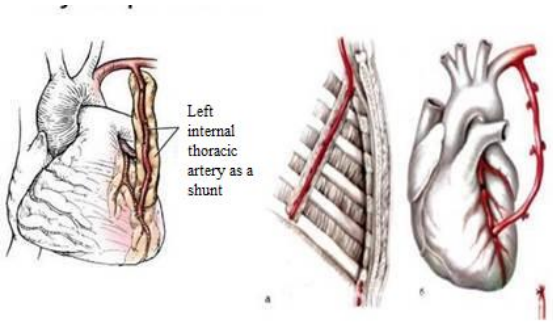
Limitations of the method application:

- there are only two internal thoracic arteries, which limits the possibility of revascularization of multiple arterial;
- isolation of the internal thoracic artery is more difficult procedure.



Pic. 2 Mammary-coronary bypass surgery

Aortic-coronary bypass surgery.

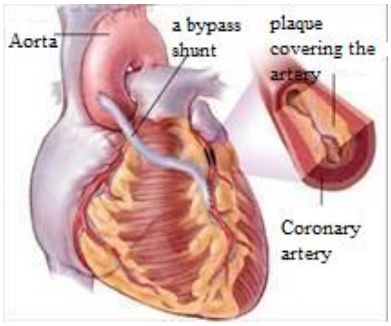
M. Tubaro describes that Rene Favaloro in 1967 first tried out the idea of creating a shunt between the aorta, arterial system and coronary vessel bypassing the affected area and narrowed by atherosclerosis. Before that, in 1962,

D. Sabiston imposed to the patient, a shunt between the aorta and the coronary artery, using the form vascular graft of great saphenous vein. But data about such an operation they were published only in 1973, i.e., after as much as 9 years. [4] If we speak for surgical treatment of coronary heart disease-coronary bypass surgery is becoming perhaps one of the most effective methods of treatment of such a disease. (rice. 3). This operation is performed in conditions of artificial blood circulation due to the large segment saphenous vein of the thigh.

The surgery access is the median longitudinal sternotomy that allows approaching the descending branches of the coronary artery on both sides. At the beginning of the operation, the coronary artery is released, above the place of occlusion, the vessel is ligated, then on it distal arteriovenous anastomosis is applied.

The next stage is the imposition of a proximal aortovenous anastamosis by lateral compression of the ascending aorta – an oval hole is excised in the aorta (d = 1 x 0.3 cm) and an end-to-side anastomosis is applied.

In addition to the large subcutaneous femoral vein, thoracic, radial, inferior epigastric autoarteria can be used. If there are several coronary artery lesions , then there will be several shunts (2-6 pcs.)



Pic. 3. Coronary artery bypass grafting

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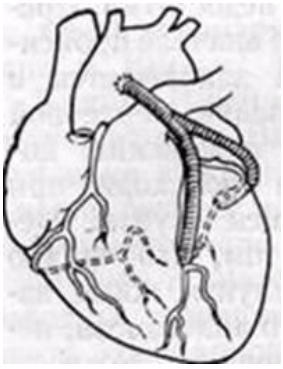
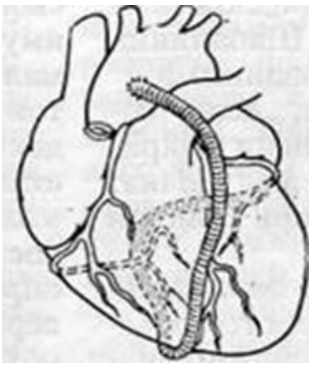
If we talk about technical methods of coronary bypass surgery, then select two main ones (Pic. 4, 5):

1) Sequencing (serpentine) shunt. There are several technical options for coronary bypass surgery (pic. 4, 5):

1. "Serpentine" or sequential shunt. This method involves creating a shunt with sequential anastomoses that is bypass surgery is performed using a single graft several of the coronary arteries. The sequence of anastomoses passes "side to side" between the revascularized vessel and the graft-here the distal anastomosis is added “side to side".
2. U-shaped shunt. Doughty D. B. describes this method - by sewing the proximal anastomosis of the shunt to one side the other. This method used for severe thinning of the walls of the ascending aorta, as well as in the case of a small area of the aorta and a significant number of revascularized vessels. [20]



Pic. 4 U-shaped shunt



Pic.5 "Serpentine" or sequential shunt

III. RESULTS

After the operation, a patient was monitored for a week, and the patient was treated with CHD surgically. The first three days the patient was weak and lethargic, on the fourth or sixth day the patient's health improved. On the seventh day, the patient was able to walk safely, periodically went for a walk himself, and there were no more complaints about the previously indicated symptoms during the postoperative period. The attacks of tachycardia and shortness of breath also stopped. The operation can be considered successful. The patient is also recommended-the following frequency of visits after hospital discharge within 1 year: on the 1st month, 6th month, 12th month.

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IV. DISCUSSION

Most people think: why do they need heart surgery? How can it help a person with CHD?

Based on the work, we would like to note the importance of cardiac surgery in CHD. Surgical treatment is shown to patients who are cured on the basis of medicinal drugs become impossible or drug therapy when powerless, or in advanced cases of illness. In such situations treatment of CHD by surgical means becomes the only way out of the current difficult situatio

V. CONCLUSION

As the results showed, after the operation, the patient ceases to complain about the previously indicated signs of CHD. The quality of his life in the post-operative period improves significantly (for example, the patient could not perform physical activities before the operation, and it was difficult to walk for him. On the seventh day in the postoperative period, he easily began to go for a walk himself). This leads to the conclusion that in severe or advanced cases of CHD the only method of treating the disease becomes a surgical intervention.

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