

## ANATOMICAL ASPECTS OF CARDIAC TRANSPLANTATION

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**Abstract:** This article is devoted to the study of the most important organ in the human body - the heart, the study of its development, structure, topography, innervation, functions, modern research methods. The relevance of the study is explained by the high incidence of cardiovascular diseases in people. In addition, indications, contraindications, the technique of performing a heart transplant operation and complications after it are given.

**Keywords:** heart, transplantation, cardiovascular system, surgery, anatomy, vessels.

### INTRODUCTION

Despite advances in pharmacotherapy of cardiovascular diseases, heart transplantation remains the only treatment method for a number of patients with heart failure that improves their prognosis and quality of life. The heart is the central organ of the cardiovascular system. It is a four-chambered muscular organ consisting of the right and left ventricles and atria. It has an irregular conical shape, slightly flattened in the anteroposterior direction. The human heart is located in the chest cavity, in the center, with a slight shift to the left. On the outside, it is surrounded by a membrane - the pericardium. Between the heart and the pericardium is a fluid that moistens the heart and reduces friction during its contractions [2-4].

### MATERIALS AND METHODS

The heart develops from two symmetrical rudiments, which then merge into one tube (simple tubular heart), located in the neck. Due to the rapid growth of the tube in length, it forms an S-shaped loop (sigmoid heart). From the venous section of the sigmoid heart, the atria develop, and from the arterial section, the ventricles. The first contractions of the heart begin at a very early stage of development, when the muscle tissue is barely visible [3-4]. The superior and inferior vena cava flow into the right atrium. At the point where these veins flow, a wave of contraction of the heart muscle occurs, quickly covering both atria and then passing to the ventricles. In addition to the great vena cava, the coronary sinus of the heart also flows into the right atrium, through which venous blood flows from the walls of the heart itself. The opening of the sinus is closed by a small fold (thebesian valve). Four pulmonary veins flow into the left atrium. The largest artery in the body, the aorta, emerges from the left ventricle. It first goes to the right and up, then, bending back and to the left, it crosses over the left bronchus in the form of an arc. The pulmonary artery emerges from the right ventricle; it first goes to the left and up, then turns to the right and divides into two branches that go to both lungs [3].

### RESULTS AND DISCUSSION

The heart is in working order throughout a person's life, does a huge amount of work and needs abundant nutrition. Therefore, its blood supply is arranged in such a way that it fully ensures the inflow and outflow of blood. The cardiac muscle receives blood before all other organs through two coronary arteries, which branch off from the aortic bulb in the area of its right and left sinuses. Even at rest, the abundantly developed network of coronary vessels of the heart receives about 5-10% of all the blood ejected into the aorta. The right coronary artery is directed along the transverse groove to the right toward the back half of the heart. It supplies most of the right ventricle, the right atrium and part of the back surface of the left heart. Its branch supplies the conduction system of the heart – the Aschoff-Tawar node, the bundle of His. The left coronary artery divides into two branches and supplies most of the left heart and the front part of the right ventricle. The coronary arteries divide into a large number of branches, widely anastomosing with each other and scattering into a very dense network of capillaries, penetrating everywhere, into all parts of the organ [1]. The heart has twice as many (thicker) capillaries than skeletal muscle. Venous blood flows from the heart through numerous channels, the most significant of which is the coronary sinus, which flows independently directly into the right atrium. All other veins collecting blood from individual areas of the heart muscle also open directly into the heart cavity: into the right atrium, into the right and, partially, into the left ventricle. Three-fifths of all the blood passing through the coronary vessels flows through the coronary sinus, while the remaining two-fifths of the blood are collected by other venous trunks [3, 4]. Contractions of the heart occur automatically, but its activity is regulated depending on the needs of the body by the central nervous system.

The transplantation methods include the atrial technique of orthotopic heart transplantation (anastomosis of the left atrium, interatrial septum, right atrium, aorta and pulmonary artery of the donor and recipient hearts), the cava-caval technique of heart transplantation, which differs from the atrial technique in that it anastomoses the superior and inferior vena cava without dissecting the right atrium, and a combined technique (Shumakov V.I.). Unlike the above, it involves the imposition of an anastomosis either between the recipient's vena cava with the donor's right atrium (in the form of a narrow "bridge"), or between the lateral edge of the incision of the inferior vena cava of the donor heart and the posterior wall of the recipient's right atrium, lateral to the oval fossa, as well as between the opposite edge of the incision of the inferior vena cava of the donor heart and the edge of the recipient's right atrium. After transplantation, immunosuppressive drugs are prescribed [2].

According to the results of uncontrolled trials, anticoagulants, aspirin and high doses of cyclosporine have little effect on the risk of coronary arteriopathy, and 5 years after transplantation it occurs in 40-45% of patients. Sometimes in such cases a repeat heart transplant is performed, but due to the low survival rate after it and the shortage of donors, this is rarely done [3].

## CONCLUSION

Thus, despite advances in the field of pharmacotherapy of cardiovascular diseases, heart transplantation remains the only treatment method for a number of patients with heart failure that significantly improves their prognosis and quality of life. However, it should be noted that detailed knowledge of the anatomy of the heart and blood vessels is crucial for the successful implementation of this operation.

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