

THE STRUCTURE OF THE HUMAN HEART

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Abstract: The human heart is located in the chest, approximately in the center with a slight shift to the left. It is a hollow muscular organ. It is surrounded from the outside by a shell – the pericardium (pericardial sac). There is a liquid between the heart and the pericardial sac that moisturizes the heart and reduces friction during its contractions.

Keywords: hearts, blood, myocardium, pulse, motor, pulse, diastole, systole, seconds, tissues.

Introduction The heart is divided into four chambers: two right ones – the right atrium and the right ventricle, and two left ones – the left atrium and the left ventricle. Normally, the right and left halves of the heart do not communicate with each other. With congenital malformations, holes may remain in the atrial and interventricular septa through which blood flows from one half of the heart to the other. The atria and ventricles are connected by holes.

On the edges of the holes there are flap valves of the heart: on the right – tricuspid, on the left – bicuspid, or mitral. The bicuspid and tricuspid valves provide blood flow in one direction – from the atria to the ventricles. There are valves between the left ventricle and the aorta extending from it, as well as between the right ventricle and the pulmonary artery extending from it. Because of the shape of the flaps, they are called semilunar. Each semilunar valve consists of three leaves resembling pockets. The free edge of the pockets is turned into the lumen of the vessels. Semilunar valves provide blood flow in only one direction – from the ventricles to the aorta and pulmonary artery.

The work of the heart includes two phases: contraction (systole) and relaxation (diastole). The cardiac cycle consists of atrial contraction, ventricular contraction and subsequent relaxation of the atria and ventricles. Atrial contraction lasts 0.1 seconds, ventricular contraction - 0.3 seconds.

2. Materials and methods of research

During diastole: the left atrium fills with blood, blood flows through the mitral orifice into the left ventricle, during contraction of the left ventricle, blood is pushed out through the aortic valve, enters the aorta and spreads to all organs. In the organs, oxygen is transferred to the tissues of the body, for their nutrition. Then the blood collects through the veins into the right atrium, through the tricuspid valve it enters the right ventricle.

➤ During ventricular systole: venous blood is pushed into the pulmonary artery and enters the vessels of the lungs. In the lungs, the blood is oxygenated, that is, it is saturated with oxygen. Oxygenated blood is collected through the pulmonary veins into the left atrium.

The rhythmic, constant alternation of the phases of systole and diastole, necessary for normal operation, is provided by the occurrence and conduction of an electric pulse through a system of special cells – through

the nodes and fibers of the conductive system of the heart. Impulses arise initially in the uppermost, so-called sinus node, which is located in the right atrium, then pass to the second, atrioventricular node, and from it – along thinner fibers (legs of the His bundle) – to the muscle of the right and left ventricles, causing a contraction of their entire musculature.

The heart itself, like any other organ, requires oxygen for nutrition and normal activity. It is delivered to the heart muscle through the heart's own vessels – the coronary ones. Sometimes these arteries are called coronary arteries.

The coronary vessels extend from the base of the aorta. They are divided into the right coronary artery and the left coronary artery. The left coronary artery, in turn, divides into the anterior interventricular and circumflex arteries. The right coronary artery supplies blood to the walls of the right atrium and ventricle, the posterior part of the interventricular septum and the posterior wall of the left ventricle, the sinus and atrioventricular node. The left coronary artery supplies blood to the anterior part of the interventricular septum, the anterior and lateral walls of the left ventricle, and the left atrium.

Pulse is the fluctuations of the arterial wall that occur with each contraction of the heart.

The movement of blood through the vessels depends on the pressure created by the heart at the time of blood release and the resistance of the vessel walls to blood flow. The pressure in the aorta at the time of contraction of the ventricles of the heart is maximum, and is called systolic. During relaxation, there is a residual pressure in the left ventricle, which is called diastolic. The amount of blood pressure is influenced by the lumen of blood vessels, blood viscosity, and the amount of blood circulating in the vessels. As you move away from the heart, the blood pressure decreases and becomes the lowest in the veins. The difference between high blood pressure in the aorta and low pressure in the hollow veins ensures continuous blood flow through the vessels.

The heart is the "motor", the center and the holy of holies of the human body. He was praised by great poets, studied by the best scientific minds. Today, science knows almost everything about the heart. But even the world's leading cardiologists never cease to be amazed at the perfection of his work.

The physiological properties of the heart are truly impressive. It is able to contract rhythmically without the influence of external stimuli. Impulses arise in the organ itself! This phenomenon is called automatism of the heart. When electrical, chemical and other stimuli act on it, the heart muscle (myocardium) is excited and, as a result, its contraction occurs. During periods of excitement and contraction, the heart becomes nothing more than an electric generator: the tissues of the human body, having high conductivity, allow recording electrical potentials. Their recording is carried out using electrocardiography (ECG), the most common and affordable method of diagnosing heart function.

3. Conclusion

From an anatomical point of view, the heart is a hollow muscular organ. Its main function is to ensure uninterrupted blood flow through the vessels and, accordingly, blood supply to all organs and systems of the human body. This task is difficult and requires incredible endurance. Despite its small size, the heart has it. In just one minute, it pumps five to six liters of blood. And in extreme conditions under heavy loads, it can withstand a load of 30 liters in 60 seconds!

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