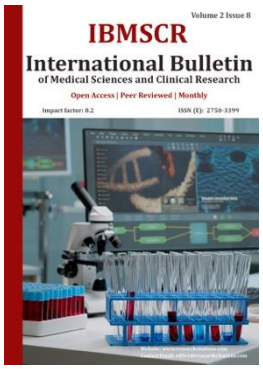

THE ANATOMICAL STRUCTURE OF THE ORGAN, PHYSIOLOGY, AND METHODS OF BALANCE EXAMINATION

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Annotation: In this scientific article, the balance organs of humans and vertebrates are the vestibular apparatus. In addition to the vestibular apparatus, the skin, musculoskeletal and visual sensory reflex play a significant role in maintaining balance in a person. The complex relationships formed in the process of these reflections ensure balance.

Keywords: muscle-joint, anatomy, microanatomy, histology, plastic anatomy, cardiovascular.

Humans have been interested in the structure of their bodies for millions of years. The development, formation, functions of organs and tissues, and the control of the body through the nervous system have always been at the center of his attention. The second signaling system, characteristic only of humans (speech), the complex processes of thinking, sensing, inference, and the ability to control them, related to the functioning of the brain, remain relevant even today. Since ancient times, the science of "anatomy" has studied the structure and development of the human body. The word anatomy, from the Greek "anatomeo" - cut, cut, learn, was studied by dissecting the human body, making resections, drawing pictures, injecting colored substances into the blood vessels, and using X-rays. The anatomy of a patient or a corpse that is examined visually, recognized, and grasped by the hand is called macroanatomy. Microscopic examination of invisible tissues, cells, and even intracellular structures is called microanatomy or histology. The aforementioned are morphological sciences and are an integral part of biological science. Ancient anatomy was limited to the study of organs separately and the presentation of evidence. Modern anatomy, on the other hand, studies not only the organs and tissues of a person from the development of the fetus in the womb to the birth of the newborn, from birth to old age, but also the process of growth of the organism depending on age with the influence of the external environment, the structure of a healthy organ, its boundaries and sex. Functional anatomy studies the functioning of organs, topographic anatomy studies their location, plastic anatomy (for artists) studies the appearance of the body, structural anatomy studies the body by dividing it into separate systems (bones, joints, internal organs, etc.).

The dissection method was performed on a corpse, which is considered the oldest and is still used today. **Especially widespread is the method of studying the cadaver by freezing each organ and cutting it out according to the method of N. I. Pirogov:**

- The study of height, weight, and other indicators in living individuals is called an anthropometric method.
- Injecting colored substances into the vessels or into hollow organs is called an injection method.
- The X-ray method is particularly useful in the study of bones and internal organs.
- The palpable (palpacio) method of studying organs through the skin is widespread.

- The percussion method is also widely used in the study of organs on fingers or special clubs.
- A method for determining the activity of the heart and lungs using special auditory instruments (auscultation) is widespread.
- Tissues and cells are studied using special instruments (microscope, electron microscope) by staining.
- Methods such as filling empty organs with a substance that quickly hardens, destroying organ tissues with the help of chemicals, while preserving their shape, are relevant.

Although the history of the science of "human anatomy" spans millions of years, it developed more during the time of scholars such as Hippocrates, Pythagoras, and Aristotle, who lived and worked in Greece before our era. Hippocrates (Buchrates) collected and studied information related to human structure and enriched it further. In his 72 works, he accumulated much information about the cardiovascular system. Since other sciences were not sufficiently developed at the time, he not only collected a lot of information, but also made mistakes such as replacing nerve fibers with tendons. Aristotle (384-322 BC) was a philosopher and anatomist. He was the first to distinguish not only the nerve fibers from the tendon, but also the blood vessels, especially the aorta, from the heart. This was the first reliable information about the circulatory system. While serving as a palace physician, the hero-phillic invented dissections of corpses, studied the heart, blood vessels, peripheral nerves, and even discovered sensory and motor nerves in those times.

Claudius Galen (Jolinus Doctor) (130-210) studied bones, joints, muscles, the brain and spinal cord, collecting a lot of information. In his view, man is governed by the dissemination of the spirits in his liver, heart, and brain to other organs. He was among the first to correctly illuminate the blood flow in the arteries, not the air. At that time, Galen, like many other scientists, was forced to study anatomy on the example of animals due to the pressure of religion, so there are some errors in his data. Abu Ali ibn Sina (980-1037) was a famous philosopher, astronomer, mathematician, musicologist, who enriched medicine - anatomy and physiology with his observations. The work "Laws of Medicine," created by our compatriot Ibn Sina, has not lost its value even today. The first part of this book is devoted to anatomy and physiology. The work "Laws of Medicine" has been used as a textbook in the world of medicine for 600 years, especially in medical institutions. Having mastered many sciences at the age of 17, the scientist was able to collect, generalize, and enrich pre-existing medical data with his observations. Born and raised in the village of Afshana near Bukhara, and educated in Bukharan libraries, our compatriot Ibn Sina served as a court physician in Khorezm and Iran, enriching medical information with his great discoveries and making a huge contribution to the development of medicine. William Harvey (1578-1657) was the first to conduct anatomical and physiological experiments on animals, identifying the major and minor circulatory circles. At the same time, he was able to correctly justify the passage of blood from the arteries through the capillaries into the veins. Leonardo da Vinci (1452-1519) was an Italian painter, mathematician, philosopher, and scientist who made a significant contribution to the development of plastic anatomy. He dissected more than 30 bodies and laid the foundation for plastic anatomy to accurately portray human portraits and organs. András Vezali (1514-1564) was a scientist who conducted many experiments, collected information specific to the science of anatomy, created an atlas of anatomy and a number of books. Among a number of Russian scientists who contributed to the development of anatomy in Russia, the

contribution of N. I. Pirogov (1810-1881) is invaluable. He developed a method of studying the human body, dividing it into regions and cutting it layer by layer. He created many scientific innovations in the field of muscles, fasciae, and blood vessels. He laid the foundation for topographic anatomy, creating over 750 paintings based on the method of freezing and crushing. At the same time, scientists such as V.I. Bes, D.N. Zernov, V.M. Bekhterev, I.M. Sechenov, I.P. Pavlov, P.F. Lesgaft also made a significant contribution to the development of anatomy and physiology. Academician V.P. Vorobyov (1876-1937) - conducting scientific research on the organs of the human body and nerve fibers, managed to create an anatomical atlas consisting of 5 volumes. She is the author of many news articles on embalming. The contribution of a number of Uzbek scientists to the development of anatomy and physiology is enormous. In particular, scientists such as Kh.Z. Zokhidov, R.E. Khudoyberdiev, K.A. Zufarov, N.K. Akhmedov, Y.Kh. Turakulov, and Zh.Kh. Khamidov have enriched the sciences of anatomy, physiology, biochemistry, and histology with their observations and experience, earning worldwide recognition.

The organism is composed of cells, tissues, organs, and liquid substances, the components of which are connected on the one hand by fluid (humor) moving in the vessels, and on the other hand by the nervous system, which regulates and regulates their activity. The cell is an elementary particle of living oiganism, oiganism is the basis of life activity. The main properties of life: reproduction, metabolism, etc., involve the proteins that make up these cells. Between the cells, there is an extracellular substance, which consists of the main substance in a liquid, fluffy, or dense state, and various fibers. The cells have a complex microscopic structure, ranging in size from a few microns to 200 microns. Each cell consists of a cytoplasmic shell, cytoplasm, and nucleus. Complete information about the cell is provided in histology. Tissue is a historically formed collection of cellular and extracellular substances that are identical in origin, structure, and function.

There are four types of tissue in the body: epithelial, connective, muscular, and nervous.

1. Epithelial tissue a (textus epithelialis) consists of a layer of cells lying in the basement membrane, beneath which soft-fiber connective tissue a is located. These cells, covering the body surface (skin) and mucous membranes, act as a protective agent, isolating the oiganism from the external environment. The epithelium also forms the glandular tissue of the glands of internal and external secretions. The epithelium is single-layered and multi-layered. Single-layered epithelium is divided into cylindrical, cubic, and flat.

2. The tissue of the internal environment (support-trophic and protective tissues, connective tissue a) is formed by the esophagus, which includes blood, lymph, and connective tissue. Connective tissue differs in structure and function. They consist of intercellular, intercellular, collagen, elastic, reticular fibers, and the main substance. Connective tissue includes specific connective tissue, cartilage and bone tissue. Private connective tissue is divided into soft and dense fibrous connective tissue. The connective tissue performs supporting, protective, and trophic (feeding) functions. The soft connective tissue is composed of fibroblasts, which bind other types of tissue together, filling the cavities in the organs. This tissue is more often located around blood vessels.

Cartilaginous tissue consists of 2-3 cartilaginous cells (chondrocytes) arranged in a group a and the main substance arranged in a gel shape. It is divided into hyaline and elastic cartilage. The hyaline cartilage is in the form of a blurry glass, the outer surface of which is covered with a superficial membrane. They form the articular cartilage of the bones, the cartilage part of

the ribs, and the cartilage of the respiratory organs. The main substance of the cartilage tissue with collagen fiber contains a large number of collagen fibers, which ensures the strength of the cartilage. They form the intra-articular disk, menisci, and the fibrous ring of the intervertebral disc. The main substance of the elastic cartilage tissue contains a large number of cross-linked elastic fibers, which are yellow in color. They form the superlacrimal cartilage and the cartilage of the auricle. Bone tissue a differs in its mechanical properties. It consists of bone cells located inside a calcified intercellular substance with ossein fibers and inorganic salts. Bone tissue a is the hardest and strongest tissue in an organism.

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