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Results. The initiative steps for hyoid cell mass establishment belong to the pharyngeal apparatus, the third and second arches respectively. Second, or the hyoid arch, is the source of development for the lesser horns of bone; third arch – for the larger horns and inferior part of the body. In 10,0 mm of PCL human fetuses the hyoid precursor is seen as dense, homogenous mesenchymal condensation straight beneath the precursor of the tongue. An early precursor of the hyoid bone is represented by a distal part of the Reichner's cartilage.This rudiment is seen as a pre-cartilaginous mass of cells with a pale, abundant cytoplasm, which means that in 13,5 mm of PLC human prefetus hyoid bone is at a stage of pre-chondrification. In 20,0 and 50,0 mm of PCL human prefetuses, lateral edges of the hyoid body are somewhat rounded and thickened. Hyoid at this stage of prenatal development has moved to the chondrificational phase. Chondrification is initiated in the anterior portions of the body – cytoplasm of these cells becomes more eosinophilic, as well as the extracellular matrix. Extracellular space increases in volume, making cells of body of the hyoid bone move along with directions of tissue enlargement. The lesser and the greater horns are found in a close interposition one to another. It is important to mention that between these masses of cells that form the larger horns and the body of the hyoid itself one can observe a distinctive bordering line, separating these two anatomical portions of bone. The bordering line is represented by tightly packed undifferentiated cells. In studied material of prefetal period no signs of ossification have been found. In 20,0 mm of PLC human prefetus hyoid bone has a bilobular appearance, surrounded on both sides by branches of hypoglossal nerve.

Conclusions. An early precursor of the hyoid is found as a derivative of the pharyngeal apparatus in the middle of the embryological period of human prenatal development. Separation of the mesenchymal precursor mass into body and horn part is seen at the end of the embryological period, separated by a bordering zone. Chondrification of the hyoid bone is initiated at the beginning of prefetal period.

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MICRO- AND ULTRAMICROSCOPIC CHARACTERISTICS OF FIBROUS CONNECTIVE TISSUE WITHIN THE LEAFLETS OF THE ATRIA-VENTRICULAR VALVES OF THE HUMAN HEART

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Introduction. The normal functioning of the heart valve depends on the complex interaction of all its structural components. Morphological and functional changes of just one of the components of the valve complex lead to a disorder of the closing function of the valve and the pumping function of the heart. Cardiovascular diseases of various genesis arise as a result of different morphological and functional changes due to the action of different negative factors during a human life. Today, the growth of cardiovascular diseases increases the needs of clinical medicine for a more detailed understanding of structural and functional transformations on the level of a tissue or a cell of the heart valves. In addition, the grate knowledge within this area of medicine would provide a qualified treatment. In conclusion, it will be possible to save the human life.

The aim of the study. The purpose of this investigation was to study and to determine the morphological characteristics of the fibrous connective tissue within the leaflets of the atria-ventricular valves of the human hear tin the norm.

Material and methods. The study was performed on 29 hearts of adults using light and electron microscopy. Hearts of adults were obtained from autopsy cases. Biological materials were formalin-fixed, paraffin-embedded, and stained with hematoxylin and eosin. Slinchenko method was used for identifying elastic and collagen fibers in the fibrous connective tissue or muscle cells in the heart valve leaflets. An electron microscope EMV-100 LM was used for the ultramicroscopic investigation of the leaflets of the human heart valves. Semi-thin sections, 1-2 μm thick, were stained twice with solution A and solution B. The solution A included two dyes: methylene blue and azure, and solution B – fuchsin.

Results. Examination of the histological sections using light microscopy showed that the leaflets of the atria-ventricular valves of the heart have a layered structure. Specifically, the spongy layer, the fibrous layer and the ventricular layer were identified in the direction from the atrial surface to the ventricular surface of the valve leaflet. Staining of histological specimens with methylene blue-azure-fuchsin made it possible to establish that the spongy layer of the leaflet consists of weakly organized connective tissue. The obliquely oriented collagen fibers and numerous longitudinally oriented elastic fibers, as well as cells fibroblasts and fibrocytes, were found within the spongy layer. Many other cell types, such as a mast cell, a macrophage, a smooth muscle cell and an interstitial cell were found within the spongy layer additionally to fibroblasts and fibrosytes. All these cells were possible to identify and to differentiate them each other using the electron microscope. The fibrous layer of the leaflet consists of very densely packed thick bundles of collagen fibers that are arranged in parallel. Between bundles of collagen fibers are mature cells of the fibroblastic row. The ventricular layer of the leaflet is the thinnest one. It also contains elastic fibers, but less than in the spongy layer. Collagen fibers run in different directions: obliquely, radially, and in the form of arcs. The different direction of the collagen fibers is due to a penetration of the collagen fibers from the chordae tendinea. Collagen fibers entering the leaflet are woven into the fibrous components of the leaflet and reach the fibrous ring within the leaflet's fibrous layer. Islands of striated cardiac muscle tissue were found in the thickness of the connective tissue closer to the fibrous ring.

Conclusions. Thus, the data of this investigation determined that the fibrous connective tissue makes the basis for the leaflet of the atria-ventricular valve. Connective tissue is arranged into three clear detectible layers. They are spongy, fibrous and ventricular. Spongy layer is made up of loose connective tissue, fibrous layer – by dense regular connective tissue, ventricular layer – by dense irregular connective tissue.

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MORPHOMETRIC PARAMETERS OF THE TEMPOROMANDIBULAR JOINT IN THE SECOND TRIMESTER OF FETAL DEVELOPMENT

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Introduction. Currently, it is significant to study the anatomical variability of human, its morphometric characteristics, relationships of organs, anatomical structures, their parts at all stages of human development. However, information on the structure of the temporomandibular joint (TMJ) during fetal development remains controversial and contradictory.

The aim of the study. The study is aimed to examine the anatomical and morphometric features of the TMJ in the second trimester of fetal development.

Material and methods. The research was performed on 4 fetuses from 161.0 mm to 295.0 mm of parietal-heel length utilizing morphological methods (morphometry, craniometry, macro- and micro preparation, computed tomography).

Results. It is established that in fetuses of 4-6 months the articular fossa has a flat shape. The bone substance of the articular fossa is thin. There are no pronounced protrusions on zygomatic process of the temporal bone, which confirms the absence of the articular tubercle in this period. The formation of elements of the synovial membrane of the joint capsule is observed. The folds and twists of the connective tissue plate are determined in the lower and upper parts of the joint cavity and capillaries grow into the synovial membrane. The TMJ is adjacent to the lateral pterygoid muscle, and the parotid gland is adjacent to the outside and above. The right and left TMJs maintain the equivalent size. Morphometric parameters of the external structures of the TMJ in the dynamics of the second trimester gradually increase. The articular disc is represented by dense fibrous connective tissue. The tissue of the articular disc is penetrated by individual blood vessels. In certain areas, their number increases, yet closer to the attachment of the articular disc to the anterior part of the articular capsule the number of vessels decreases. In fetuses of 4 months the circumference at the level of Glabella, parietal humps and Inion (outer occipital hump) is 132 ±