The study was performed on 27 hearts of adults using light microscopy, electron microscopy, immunohistochemical method. Hearts of adults were obtained from autopsy cases. Biological materials were formalin-fixed, paraffin-embedded, and stained with hematoxylin and eosin, immunohistochemically for CD31, CD34 cytoplasmic markers.

Examination of the histological sections using light microscopy showed endothelium itself consists of a single layer of flattened-shaped cells which are simply attached or interlocked with each other or show “roof tile”-like overlaps. In some of the endothelial cells, the cell margins have a wavy outline where were found marginal outgrowths and folds. Marginal folds were predominantly found at the edges of cells. Electron microscopy showed that the endothelial cells are separated by the basement membrane from the underlying collagen and elastic fibers of a subendothelial layer. The basement membrane is bilaminar, and it is composed of lamina densa and lamina rara. The endothelial lining looks like a “cobblestone appearance” due to the nuclei protuberance into the chamber of the ventricles. An endothelial cell has a large pale-stained nucleus with a few marginally located heterochromatin. The nucleus usually contains one nucleolus. A nuclear envelope has numerous invaginations in it. The nucleus was localized in the center of the cell and occupied almost the entire volume of the cell. This region of a cell where the nucleus is found is named a nuclear zone. Cytoplasmic organelles such as mitochondria with a light matrix, rough endoplasmic reticulum with large-sized ribosomes, and a few complexes of dictyosomes were concentrated around the nucleus. The numerous vacuoles and vesicles were identified around of Golgi complex cisternae. These general organelles were mainly concentrated in the organelle zone of the cell. Pinocytic vesicles and transendothelial channels were found in the peripheral zone of the cell. In some endothelial cells, the cell margins have a wavy outline where marginal outgrowths and folds were found. Marginal folds were predominantly found at the edges of cells. The endothelial cells showed finger-like projections – microvilli on their luminal surface, which project into the chambers of ventricles. We supposed that these special organelles increase the overall surface area for an increased exchange of substances between the blood of the heart chambers and endothelial cells. Probably some of these projections may be artifacts and derived from fibrin in the blood, but there is no doubt that most are true ultrastructural features of the surface of the endothelial cell. During the immunohistochemical method of the investigation we detected that the endocardial endothelium was strongly stained for CD31 but irregularly and less intensely for CD34.

Thus, the data of this investigation determined that the innermost layer of the endocardium is the endothelium. It consists of a single layer of epithelial cells that are flattened in shape. The endothelial cell contains one centrally placed nucleus with one nucleolus in it. Three functional zones are determined in every endothelial cell. These zones are the nuclear zone, organelle zone, and peripheral zone. The basement membrane supports endothelial cells and separates them from the underlying connective tissue elements. It is bilaminar. CD31 and CD34 markers are effective markers for the detection of endocardial endothelial cells.

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MORPHOMETRIC CHARACTERISTICS OF THE TEMPOROMANDIBULAR JOINT IN HUMANS DURING THE 4TH MONTH OF INTRAUTERINE DEVELOPMENT

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Despite certain progress and intensive development of dental technologies, there are several unsolved issues concerning the dentoalveolar system structures. One of its important structures is the temporomandibular joint (TMJ). Impaired development of the TMJ provokes changes of the facial contour and defects, degeneration or hypertrophy of the masticatory and mimic muscles, disorders of swallowing and chewing, and occlusion.

The aim was to determine anatomical peculiarities of the TMJ in the third trimester of intrauterine development. The study was conducted on 4 samples of fetuses 161,0-183,0 mm of the parietal-calcaneal length through the methods of morphometry and craniometry, macro- and micropreparation, computed tomography, and statistical analysis.

In the 4-month-old fetuses, flat articular fossa observed, the articular tubercle is not determined. A synovial membrane is formed in the cavity of the joint. Cartilaginous tissue embraces the outer edge of the condyloid process in the form of a strip. The density of the cartilaginous substance increases in the direction towards the surface of the condyloid process, it is difficult to dissect, the cartilage gradually turns into perichondrium and has the appearance of a dense plate. The border between cartilage and osseous tissue is uneven. The lateral pterygoid muscle is attached to the condyloid process from the front. The articular disc is formed by coarse fibrous connective tissue. The tissue of the articular disc is pierced through by single blood vessels. In certain areas, their number increases, but closer to the attachment of the articular disc to the anterior part of the articular capsule, the number of vessels decreases. Circumference at the level of glabella, parietal tubers, and inion (external occipital protuberance) is 132±7.63 mm, the distance between the parietal tubers equals 36±3 mm. The distance between glabella and inion in the sagittal plane is 43.3±3 mm, the distance between the most remote points of the zygomatic arch is 31.6±2.08 mm. The distance between the nasion and the gnathion (the lowest point of the midline of the mandible) is 21.6±1.5 mm. In 4-month-old fetuses, the distance between the right and left mandibular processes is 28±4.16 mm, between the right and left gonions – 23±3 mm. The length of the body of the mandible is 15±1.7 mm, the height of the ramus of the mandible constitutes 6±0.9 mm. The distance between the right and left mental tubercles is 7±0.8 mm, between the mandibular process and mental tubercle (the distance of the body of the mandible) – 20±2 mm. The distance between the gonion and the pogonion is 19±2 mm, the transverse width of TMJ – 1.62±0.09 mm.

The obtained and systematized results of the study can be used in the laboratories for screening morphological material to estimate the degree of maturing, for predicting a body's vital capacity as well as diagnosing abnormalities in normal development with suggestions as to their correction.

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THE IMPORTANCE OF COMPUTED TOMOGRAPHY IN THE STUDY OF HUMAN LOWER JAW BONE TISSUE

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Digital methods for paraclinical, in particular, X-ray-anatomical CT scan, which is much broader than conventional clinical radiology, provide accessibility and the ability to obtain a quick result of the study of the dynamic system of bone tissue, which depends on the course of metabolic processes and the influence of factors of the internal and external environment, causing its pathophysiological and morphological changes, including the structural topographic features of the left and right mandibular canals, temporomandibular joints, coronary and articular processes of the lower jaw. The examination is carried out more thoroughly than when performing a series of images or the usual 3D software modeling in various projections or planes, using an even wider arsenal of devices. Computed Tomography makes it possible to establish the features of the topography of human lower jaw structures, obtain information about the structure of its external and internal cortical plates, and determine densitometric values that indicate qualitative characteristics that reflect the type of bone density, taking into account its age dynamics.

Widely used methods of flame atomic emission and atomic absorption analysis provide opportunities for modern researchers to study the features of the structure and quality of maxillofacial bones by considering the content of macro- and microelements. The results of such studies are often crucial for choosing effective methods of prevention and treatment and serve only as a small part in the implementation of the rehabilitation of dental patients.

To prove the prospects of using digital techniques for morphometric analysis of human lower jaw bone tissue in modern clinical and scientific studies.

Using the digital format in three planes: frontal, sagittal, and axillary, we got a proper visual understanding already during the analysis of CT images. Using the tools of the vertical and horizontal optional panels, we marked the morphological structures of existing inclusions,