МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ

М А Т Е Р І А Л И

106-ї підсумкової науково-практичної конференції
з міжнародною участю
професорсько-викладацького колективу
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Матеріали підсумкової 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) – Чернівці: Медуніверситет, 2025. – 450 с. іл.

У збірнику представлені матеріали 106-ї науково-практичної конференції з міжнародною участю професорсько-викладацького колективу Буковинського державного медичного університету (м. Чернівці, 03, 05, 10 лютого 2025 р.) зі стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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Macroscopically, the articular disk had a dense structure positioned between the joint surfaces. A connective tissue band extended from the posterior part of the disk to the inner surface of the articular capsule. At its anterior end, the articular disk attached to the area where the future articular tubercle would develop. Fibers of the lateral pterygoid muscle were seen connecting to the anterior connective tissue band. In the middle and anterior regions, the lateral pterygoid muscle was closely associated with the TMJ, and the parotid gland was positioned externally, especially in the upper part. Both the right and left TMJs were equal in size. Morphometric analysis showed a gradual increase in the external structures of TMJ during this period.

Conclusions. In conclusion, during the second trimester of fetal development, the TMJ displays unique characteristics such as a flattened glenoid fossa and the absence of an articular tubercle. A noticeable increase in craniometric measurements suggests overall growth in skull bone mass and an enlargement of the TMJ.

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IDENTIFICATION OF DIFFERENT TYPES OF TISSUES DURING 3D-RECONSTRUCTION OF HUMAN MICROSCOPIC STRUCTURES

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Introduction. 3D-reconstruction is an informative, objective method of morphological research, which consists in transforming a series of consecutive sections (histological, macroscopic, anatomical sections, computer tomography (CT), etc.) into a virtual three-dimensional (digital) image that can be studied in different projections and measure volume, area, diameters, angles, save, copy, edit.

The aim of the study. To compare the effectiveness of 3D-reconstruction methods of various tissues and microscopic anatomical structures of the human body in the prenatal period of development.

Materials and methods. The research was carried out on 6 series of consecutive histological sections of human embryos aged 4 to 6 weeks of intrauterine development (IUD), 15 specimens of organ complexes of the head, limbs and trunks of human prefetuses aged 7 to 12 weeks of IUD, human fetuses aged 4-9 months of IUD by the method of creating histological (5), as well as histotopographic sections (10) directly from the paraffin block and their digitization, and 14 CT of human fetuses aged from 4 to 9 months of IUD. This study is conducted as part of the initiative research project by the Department of Histology, Cytology, and Embryology at Bukovinian State Medical University, titled "Structural and functional peculiarities of tissues and organs in ontogenesis, regularities of variant, constitutional, sex-, age-related and comparative human morphology". State registration number: 0121U110121. Terms of execution: 01.2021-12.2025.

Results. According to the technology of obtaining and preparing digital images of a series of consecutive sections, which are loaded into the software for further stages of creating a 3D-reconstruction, we divided the material into three groups: 1) microphotographs of a series of consecutive histological sections; 2) a series of microphotographs of the surface of the paraffin block; 3) DICOM CT files of fetuses. The stages of creating 3D-reconstructions from serial histological sections are as follows: 1) specimen preparation (injection of blood vessels, tubular and hollow organs, placement of guiding landmarks); 2) obtaining a series of consecutive sections (microtomy); 3) digitization of sections (photographing); 4) alignment of images of histological sections of a series in natural anatomical position; 5) selection of sections for reconstruction by range, number and step; 6) calibration of the morphometric block of the reconstruction software; 7) segmentation (manual delineation of contours of the anatomical structures under investigation); 8) rendering (construction of a reconstruction model using information about the volume or contours of the object); 9) study, morphometry and animation reconstruction model for demonstration.

Conclusions. 3D-reconstruction of series of consecutive histological sections is effective for the study of embryo specimens, organ complexes of prefetuses and certain microscopic structures of

human fetuses. 3D-reconstruction of histotopographic sections (images of the surface of the paraffin block) is advisable to use in the study of specimens of organocomplexes of human prefetuses and fetuses, allows identification of individual parenchymal and hollow organs and blood vessels, especially if their injection is performed before fixation of the specimen. 3D-reconstruction of CT sections is an effective and highly accurate tool for the study of X-ray contrast anatomical structures in the fetal period of the human development. The method allows to detect and measure ossification centers and syntopy of blood vessels with bones. The choice of the technique of 3D-reconstruction of microscopic structures in the prenatal period of human ontogenesis depends on the age period of the material for research, which is caused by certain technological limitations of the specific technique: 3D-reconstruction of a series of histological sections is advisable to use when studying embryos and fetuses, as well as individual structures and organs of the fetuses; 3D-reconstruction of a series of histotopographic sections – for the study of organocomplexes of human prefetuses and fetuses; 3D-reconstruction of CT-slices – for the study of individual structures of human fetuses.

Vladychenko K.A.

REGULARITIES OF ONTOGENETIC TRANSFORMATIONS OF THE MESONEPHROS OF HUMANS AND DOMESTIC PIGS IN THE PRENATAL PERIOD

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Introduction. Previous research has not conclusively clarified the process of angiogenesis in the kidneys that are being formed. Since there are no detailed studies of the microcirculatory bed of the mammalian mesonephros, this is of fundamental interest. The revealed ability to stimulate local angiogenesis and feed from the appropriate vascular bed creates the potential for metanephros transplants, which is important for practical medicine. Therefore, deepening knowledge about the peculiarities of topographical and anatomical transformations of organs and structures of the urinary system of humans and domestic pigs can help in solving the clinical task – the development of kidney xenotransplantation.

The aim of the study. To determine the peculiarities of the sources of the bookmark and the chronological sequence of topographical and anatomical transformations of the organs and structures of the urinary system of humans and domestic pigs.

Material and methods. Specimens of 12 human and 8 domestic pig pre-fetuses were studied. A set of morphological research methods was applied, which included microscopy, three-dimensional reconstruction, morphometry and statistical analysis. Periodization of prenatal development from the standpoint of comparative morphology was carried out according to Carnegie stages.

Results. By the stage of CS19 development in the human fetus, four pairs of mesonephric arteries depart from the aorta to the cranial divisions of the primary kidneys. The supply arteriole of the mesonephros is short and ends with a glomerulus. Arteries in the mesonephros of the human fetus show a tendency to dichotomous branching. Human and domestic pig mesonephros contained well-developed glomeruli in the medial parts, which are located relatively close to the aorta. Four well-developed aortic lateral branches supplied the mesonephric glomeruli before CS19 and eight arteries after CS19, while the venous network covered the tubules. Between CS16 and CS18, the mesonephric duct gradually changed its position from dorsolateral to ventrolateral relative to the human mesonephros and even to a ventromedial position in domestic pig embryos (between CS16 and CS19). In human embryos, small branches arising from the caudal cardinal veins that cross the mesonephros appeared at CS15, whereas such branches were already seen in domestic pig embryos at CS11. Subcardinal veins are present along the entire length of the mesonephros in domestic pig embryos, but in human embryos only in the caudal half of the mesonephros. The absence of this network in the cranial part of the human mesonephros at CS15 may be an early marker of future regression of the cranial part of the mesonephros. Cranial regression of the human mesonephros begins at CS15, while that of the domestic pig occurs later at CS19. The use of 3D reconstruction