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
БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ
03, 05, 10 лютого 2025 року

Конференція внесена до Реєстру заходів безперервного професійного розвитку, які проводитимуться у 2025 році №1005249

Чернівці – 2025

УДК 61(063)
М 34

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.

Загальна редакція: професор Геруш І.В., професорка Годованець О.І., професор Безрук В.В.

Наукові рецензенти:
професор Батіг В.М.
професор Білоокий В.В.
професор Булик Р.Є.
професор Давиденко І.С.
професор Дейнека С.Є.
професорка Денисенко О.І.
професор Заморський І.І.
професорка Колоскова О.К.
професорка Кравченко О.В.
професорка Пашковська Н.В.
професорка Ткачук С.С.
професорка Тодоріко Л.Д.
професорка Хухліна О.С.
професор Чорноус В.О.

ISBN 978-617-519-135-4

Material and methods. The study was performed on 19 atrioventricular valves of adult human hearts. Immunohistochemical methods and the method of electron microscopy were used for the research.

Results. Cells were found in between bundles of collagen and elastic fibers within the leaflets of the atrioventricular valves of the heart using an electron microscopy. Each cell contained one brightly stained nucleus with a predominance of euchromatin, a well-developed granular endoplasmic reticulum, and a Golgi complex. Numerous secretory granules were located in the cell cytoplasm around the nucleus. These cells are regarded as valvular interstitial cells that have the properties of secretory cells and are capable of participating in the synthesis of intercellular substance of connective tissue directly. A constant mechanical movement of the leaflets and a deformation of the connective tissue lead to a damage of the leaflets. The secretory interstitial cells respond in order to preserve the integrity of the leaflets of the heart valves.

Elongated cells with a large number of long and thin processes were detected in the leaflets of the heart valves using the immunohistochemical method using monoclonal antibodies to actin of smooth muscle cells (clone 1A4, DAKO Company). These cells were located in the connective tissue of the leaflet and they were more concentrated closer to the free edge of the leaflet. They were in close contact with the collagen fibers of the intercellular substance of the connective tissue. Cells contacted each other by some adhesive contacts. The location of α-sma antigenic determinants in the cytoplasm of these cells indicated that they contain contractile microfilaments. The obtained picture can be regarded as a prominent positive reaction (+++). These cells resembled both smooth muscle cells and fibroblasts, so they were identified as contractile valvular interstitial cells. The similarity of these cells to both smooth muscle cells and fibroblasts makes it possible to call them also myofibroblasts. Perhaps, due to the contraction of contractile interstitial cells, it is possible to resist hemodynamic pressure.

Conclusions. Thus, based on the obtained results from this morphological study using the immunohistochemical method and the method of the electron microscopy, two types of valvular interstitial cells were detected in the leaflets of the atrioventricular valves of the human heart: secretory and contractile.

Stoliar D.B.

CHARACTERISTICS OF THE HUMAN TEMPOROMANDIBULAR JOINT IN 4-6 MONTHS OF INTRAUTERINE DEVELOPMENT

Department of Histology, Cytology and Embryology
Bukovinian State Medical University

Introduction. While dental technology has advanced considerably, many structural aspects of dental components remain ambiguous, especially the temporomandibular joint (TMJ), this information is vital not only for its immediate contributions to fetal development knowledge but also for its long-term applications in medicine, dentistry, and developmental biology.

The aim of the study. This study aimed to explore the structural characteristics of the TMJ during the second trimester of human fetal development.

Material and methods. The analysis included 8 fetal specimens between 4 and 6 months old, with crown-rump lengths (CRL) ranging from 161.0 to 259.0 mm. The investigation employed various methods such as morphometry, craniometry, macro- and microdissection, and computed tomography.

Results. In fetuses aged 4 to 6 months, the glenoid fossa exhibited a flat shape, with thin bone density in this region. Projections on the malar eminence of the temporal bones base were absent, indicating that the articular tubercle had not formed yet. Development of the synovial membrane components within the articular capsule was observed, with folds and connective tissue ligaments identified in both the upper and lower parts of the articular cavity. Capillaries were beginning to grow into the synovial membrane. Some areas displayed connective tissue layers between the temporal bone and the articular disk, as well as between the disk and the head of the mandible.

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.

Tsyhykalo O.V.

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

Department of Histology, Cytology and Embryology
Bukovinian State Medical University

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