Microscopic examination of the cusps of the atrioventricular valves of infants found that their surfaces are covered with endothelium. A thin layer of loose connective tissue is visualized under the endothelium from the atrial surface. Fibroblastic cells and thin disordered elastic fibers are identified within. Disordered thick collagen fibers and fibroblastic cells are visualized in the deeper layer. Collagen fibers are better expressed in the area of the valve cusps, where the chordae tendinea are attached to the ventricular surface. Islets of striated cardiac muscle tissue were detected within the cusps using the picro-Mallory stain. Blood vessels were found in the cusps of the atrioventricular valves, both at their base and in the areas next to the free edge. In most cases there are vessels of the macrocirculatory bed at the base of the cusp. Vessels of the microcirculatory bed were found in the areas next to the free edge of the cusp.

In the valves of the aorta and pulmonary trunk, the connective tissue is arranged into three layers: fibrous, spongy and ventricular. The fibrous and ventricular layers are denser and occupy the boundary position. Collagen fibers are tightly packed, forming bundles and running in one direction within them. There are fibroblasts and fibrocytes in small quantities between the bundles of collagen fibers. In the ventricular layer of the valve cusps between the bundles of collagen fibers there are elastic fibers in significant quantities. The spongy layer is loose and it is located between the fibrous and ventricular layers and formed by loose connective tissue. In isolated cases, the cardiac muscle tissue forming small islands is found in the places where the cusps are attached to the vessel wall. Blood vessels are found in the cusps of the aorta and pulmonary trunk. Arterioles and venules are observed in the places where the cusp is attached to the vessel wall, and blood capillaries are observed directly in the spongy layer of the cusp.

Thus, the cusps of the heart valves in infants look like plates/pockets, respectively in atrioventricular valves and valves of aorta and pulmonary trunk, and are covered with endothelium. The cusps of the atrioventricular valves of the heart are formed by loose connective tissue. The islets of striated cardiac muscle tissue are in the base of them. They are supplied with blood through blood vessels in both the macro- and microcirculatory bed. The valves of the aorta and pulmonary trunk are formed by loose and dense connective tissues, which determine their layered structure. Islets of striated cardiac muscle tissue are identified at the sites of cusps attached to the walls of large blood vessels. Blood vessels of the microcirculatory bed are located at the places of the attachment of the cusp to the vessel wall and in the spongy layer of the cusp itself.

Stoliar D.B.

TOPOGRAPHICAL AND ANATOMICAL PECULIARITIES OF THE TEMPOROMANDIBULAR JOINT IN THE THIRD TRIMESTER OF THE INTRAUTERINE DEVELOPMENT

Department of Histology, Cytology and Embryology
Bukovinian State Medical University

In spite of certain progress and intensive development of dental technologies, there is a number of 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; occlusion and disorders of swallowing and chewing. The aim of the study was to determine anatomical peculiarities of the TMJ in the third trimester of the intrauterine development. The study was conducted on 4 samples of fetuses 301,0-450,0 mm of the parietal and calcaneal length by means of the following methods: morphometry and craniometry, macro- and micropreparation, computed tomography and statistical analysis.

During the third trimester of the intrauterine development the head circumference (the line through the glabella, parietal tubercles and external occipital tubercle) is 291,83±28,07 mm; biparietal diameter (between the parietal tubercles) is 77,91±7,08 mm; cranial length (sagittal distance between glabella and external occipital tubercle) is 95,91±8,77 mm; facial breadth (transverse distance between the proximal points of the zygomatic arch) is 68,58±6,14 mm; facial height (distance between nasal point and the lowest point of the mandible) is 45,16±4,48 mm. In

neonates the head circumference is 358,75±5,37 mm; biparietal diameter is 92,75±1,7 mm; cranial length is 117,25±2,75 mm; facial breadth is 87,5±3,1 mm and facial height is 52±0,816 mm. The majority of morphometric parameters increase evenly in the dynamics of the third trimester. More intensive increase can be detected concerning head circumference, mainly at the 28th, 29th and 30th weeks; cranial length occurring at the 28th, 29th and 35th weeks; biparietal diameter happening at the 30-31st and 35-36th weeks.

The majority of craniometric parameters in neonates increase evenly. At the 38th week the head circumference increases more intensively. During early neonatal period all the craniometric parameters increase which is indicative of enlargement of general osseous cranial mass, mandible and increase in the size of the temporomandibular joint.

Tsyhykalo O.V.

BLOOD SUPPLY OF THE SPHINCTER SEGMENTS OF THE EXTRAHEPATIC BILE DUCTS IN THE PRENATAL PERIOD OF HUMAN ONTOGENESIS

Department of Histology, Cytology and Embryology
Bukovinian State Medical University

The blood supply of the extrahepatic bile ducts in a human being is notable for variability which is important to take into account during surgical interferences on the organs of the hepatobiliary system. The publications of recent years adduce only insufficient data pertaining to the formation of the blood channel of the intestinal tube derivatives during the intrauterine development in a human. At the same time, ascertaining the specific characteristics of the blood vessels formation of the common bile duct at an early stage of human ontogenesis will enable to understand more profoundly the consistent patterns of the biliary tract vascularization. The aim of the research is to study the specific features of the blood stream organization of the common bile duct during the prenatal period of human ontogenesis.

The objective is to study the structural features and anatomical variability of the bloodstream of extrahepatic bile ducts, the peculiarities of blood supply of its locking devices during prenatal period of human ontogenesis. 104 specimens of human embryos, prefetuses, fetuses and newborns measuring from 4,5 to 370,0 mm parietococcygeal length (PCL) (5-40 weeks of development) were examined by means of the combination of morphological methods (anthropometry, morphometry, vascular injections, macroscopy, microscopy, graphical and 3D-reconstructions, statistical analysis).

The study established that the arterial vessels were found in the embryo of 4.5 mm PCL (beginning of the IVth week of intrauterine development) that branched from the aorta to abdominal organs. At the VIIth week of development the centers formation of blood vessels were found. At the end of prefetus period of human development all branches of celiac trunk and superior mesenteric artery were well traced. The definitive structure of the arterial system of extrahepatic bile ducts has been found typical from beginning of fetus period of human ontogenesis. Three types of arterial anastomosis were detected on the surface of the extrahepatic bile ducts, namely: 1) the arterial network; 2) a chain of longitudinal anastomoses; 3) the arterial circle. The peculiarities of spatial structure of the arterial anastomosis around the coiled part of the cystic duct proved the existence of the locking device (sphincter) between neck of the gallbladder and the cystic duct, thus playing an important role in functioning of vascular (arterial) component.

Thus, the derivates of the blood vessels of extrahepatic bile ducts come from the extra- and intra-organ sources at the IVth week of prenatal development. There were detected three types of arterial anastomosis on the surface of the extrahepatic bile ducts: 1) the arterial network; 2) a chain of longitudinal anastomoses; 3) the arterial circle. The arterial circle and circular anastomosis between neck of the gallbladder and the cystic duct may provide unobstructed blood supply, regardless of the phase of the sphincter motility and functional state of the cystic duct lock device. The arterial component of the sphincter of Oddi is presented as the anastomoses that resemble arterial circles along the medial border of the duodenum, furthermore, branching out in its muscle layer and submucosa.