

MEDICINE AND PHARMACY

Hrymailo Nataliia Andriivna

Postgraduate of the Department of Anatomy,
Clinical Anatomy and Operative Surgery of the
Bukovinian State Medical University, Ukraine

Slobodian Oleksandr Mykolayovych

Doctor of Medical Sciences, Professor, Chief of the Department of Anatomy,
Clinical Anatomy and Operative Surgery of the
Bukovinian State Medical University, Ukraine

Lavriv Lesia Petrivna

Candidate of Medical Science, Associate professor of the
Department of Anatomy, Clinical Anatomy and Operative Surgery of the
Bukovinian State Medical University, Ukraine

Stoliar Denys Borysovyh

Candidate of Medical Science, Associate professor of the
Department of Histology, Cytology and Embryology of the
Bukovinian State Medical University, Ukraine

MICROSCOPIC STRUCTURAL ORGANIZATION OF THE PANCREAS AT THE END OF THE FETAL PERIOD OF ONTOGENESIS

In pediatric abdominal surgery, the number of abdominal surgeries associated with morphological abnormalities has increased in recent years [1-2]. As a result, there are many questions about the causes of congenital malformations of the pancreas. There is an increasing interest in studying the peculiarities of the formation of the pancreas at different stages of ontogenesis [3].

30 human fetuses ranging in length from 305.0 mm to 450.0 mm of parietal-calcaneal length were used for the study. To achieve the goal of the study, the following methods were used: microscopy, morphometry, histology slides

preparation of the pancreas of human fetuses with their subsequent staining with hematoxylin and eosin.

In the third trimester of fetal development of the pancreas continues to increase markedly in its mass. The organ has already undergone the formation of the architecture of a complex alveolar-tubular gland, but the processes of morphofunctional differentiation of the stromal, vascular components, and the parenchyma of the pancreas are still ongoing. Particularly active in the process of differentiation are the cells of the exocrine and endocrine parts of the parenchyma of the pancreas.

On histological slides of the pancreas, the already formed lobular structure was observed. The capsule is thin, represented by connective tissue, tightly fused with the visceral peritoneum.

On the periphery of the pancreas, under the capsule, there is still a thick layer of connective tissue. There are a large number of blood vessels in it and a few blindly finished anastomotic tubules lined with a single layer of cubic epithelium are found.

The thickness of the interlobular connective tissue between the already formed lobules of the pancreas, compared with earlier stages of development, decreases significantly, and the overall size of the lobes increases accordingly. The number of collagen fibers and their acidophilia increases in the interlobular connective tissue.

In blood vessels, both arterial and venous, the lumen is irregular. In the wall of these vessels, all three of their membranes are differentiated: adventitia, media, and intima. In the wall of the arteries in the tunica intima already has a formed layer of endothelial cells and an inner elastic membrane.

The main duct of the pancreas is externally surrounded by a massive layer of loose connective tissue, which increases the number of collagen and elastic fibers and cells of the fibroblastic row. Its wall is formed by two layers. Inside it is lined with a single layer of cylindrical epithelium, among which there is a small number of goblet cells and endocrine cells, and outside is its layer of loose connective tissue.

At the end of the fetal period of ontogenesis, the lobular structure of the pancreas is already well expressed, the total number of lobules and their total size

increases. In each lobe the number of islets of Langerhans, acinar, and beta secretory cells, mature pancreatic acini increases, in comparison with the early fetal period. The entire area between the tubuloacinar glands of the exocrine part and the pancreatic islets is occupied by the intralobular loose connective tissue. In its thickness are part of the system of excretory ducts and vessels of the micro-circulatory tract of the pancreas. The vessels entwine a dense network of all structural and functional components of the lobe.

By the end of the prenatal period, the pancreas, as an organ of the digestive system, begins to perform its specific functions. However, it does not complete its morphofunctional formation in full and continues in the postnatal period.

References:

1. Craig ME, Kim KW, Isaacs SR, Penno MA, Hamilton-Williams EE, Couper JJ, Rawlinson WD. Early-life factors contributing to type 1 diabetes. *Diabetologia*. 2019 Oct;62(10):1823-1834. doi: 10.1007/s00125-019-4942-x. Epub 2019 Aug 27. PMID: 31451871.
2. Henry BM, Skinningsrud B, Saganiak K, Pękala PA, Walocha JA, Tomaszewski KA. Development of the human pancreas and its vasculature - An integrated review covering anatomical, embryological, histological, and molecular aspects. *Ann Anat*. 2019 Jan;221:115-124. doi: 10.1016/j.aanat.2018.09.008. Epub 2018 Oct 6. PMID: 30300687.
3. Jennings RE, Berry AA, Strutt JP, Gerrard DT, Hanley NA. Human pancreas development. *Development*. 2015 Sep 15;142(18):3126-37. doi: 10.1242/dev.120063. PMID: 26395141.