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MORPHOLOGICAL CHANGES OF THE THYMUSIS OF STILLBORN INFANTS AT 28-33 WEEKS OF THE ANTENATAL PERIOD

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Abstract
Infant mortality in the antenatal period depends on the duration of the gestational period, and it continues most often in the 22-27, 28-32, 33–38-week period due to the violation of the integrated functional connection with the thymus and adrenal glands, which are not yet fully formed. Those who died from intrauterine infection in the antenatal period make up 78.2% of all babies and form the basis of our research. Lagging behind the morphological development in the pituitary gland: it is characterized by the fact that the cortex of the thymus covers a very small area of the medulla, and there are almost no lymphocytes. As the main morphological substrate of these changes, the size of the reticuloepithelial cells of the thymus cortical layer is small, the desmasomas are short and thick, the number of sparse fibrous structures connecting the spaces of the desmasomas in the perivascular areas of the cortical layer, it has been shown that the hematohistiogenic barrier has been brought to a functionally damaged state.

Keywords: Thymus, morphology, involution, immunodeficiency, necrosis, apoptosis.

Introduction

The urgency of the problem. In the world, newborn babies or perinatal pathologies account for 1-4% of every 1000 births, and it is understood that the fetus is stillborn due to intrauterine infection. Among the developed countries, in the USA and Europe, this indicator is on average 4-5 per 1000 births. In the world's top five, Turkmenistan has 45, Tajikistan 33, Azerbaijan 21, Kyrgyzstan 17 and Uzbekistan 16 cases per 1000 births [1]. This indicates that extragenital disease screening during fetal development or examinations that should be performed during pregnancy have not been fully implemented [2]. In perinatal pathologies, antenatal death mainly develops

[1] United Nations Global SDG Database 2022.
[2]Morphology of fetal losses after antenatal hypoxia IV BARINOVA, CAND. MED. SCI. doi: 10.17116/rosakush201515214-18

together with processes of infectious and non-infectious etiology and manifests itself in the form of fetal immaturity, asphyxia, birth trauma, pneumopathies, perinatal blood circulation disorders in the brain, and hemorrhagic disease of newborns.

The purpose of the research is to study the pathomorphological characteristics of the thymus tissue during antenatal death of infants.

Material and methods. Morphological methods of thymus tissue of stillborn babies were used in the antenatal period.

Discussion and Result

At 28-33 weeks, it was found that in the intra-fetal development of the thymus, the standard histiotopographical structure lags behind the development, the sharp thickening of the external fibrous capsule, and the trabecular tumors in the perimeter of the lobes lead to a violation of the flat trajectory. It was found that the average weight of the thymus of this group was 4.75±2.16 g. Morphological changes in the form of thickened walls of trabeculae, fullness of vessels, proliferation of fibroblasts, irregular formation of collagen fibers in different directions, presence of interconnected branches with macrophages and reticuloepithelial cells in the perimeter , lack of lymphocytes in subtrabecular branches are determined. If we take into account the formation of the cortex and medulla in this period, it is determined that the medulla occupies a very small area only in the central parts of the thymus, the cortex occupies a large area, and Gassal's corpuscles are formed in different sizes in the cortex(**Figure 1**).

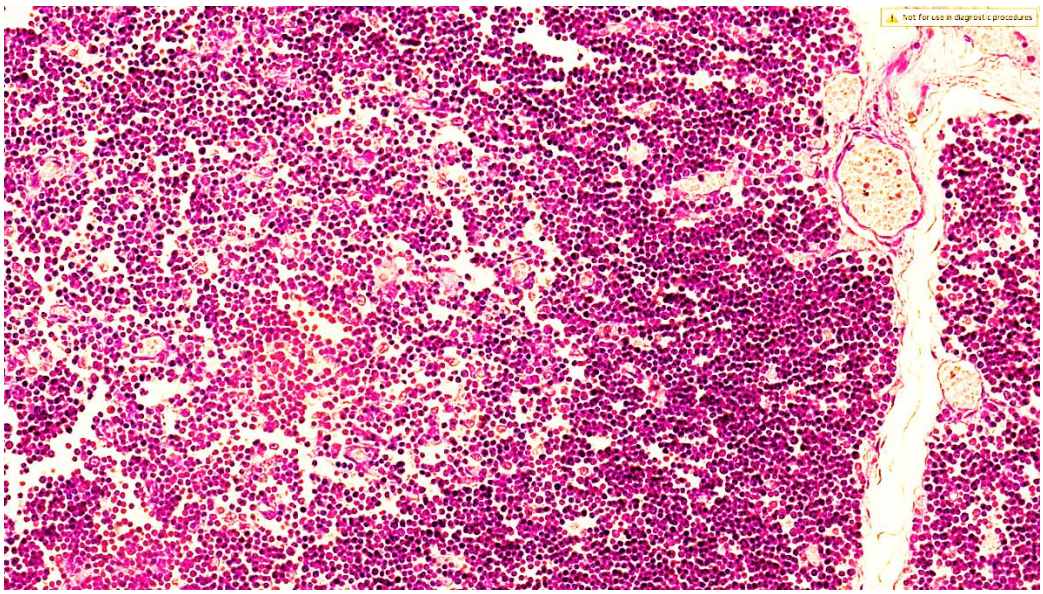

Figure 1. Antenatally dead baby born at 33 weeks of age. Minutes 49D. In the thymus lobe, indiscriminately developing Gassal corpuscles (1) of various sizes, ingrowth of the trabecular barrier into the medulla in the cortical layer, and tumors formed in the space are identified. In the medullary layer, the denuded lesions of the stroma are identified. Fullness is determined in blood vessels of all layers. Paint G.E. The size is 10x10.

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Compared to this period in the norm, taking into account that the wall of the thymus lobes has a straight trajectory, in the studied group, there is a sharp thickening of the fibrous connective tissue in the wall of the lobes, the formation of rough septa, a large number of macrophages in the perivascular areas, and 7-12 apoptotic lymphocytes in the cytoplasm of 200x size. meeting, triangular and stellate appearance of reticulo-epithelial cells has changed to elongated fibrous appearance, there are empty bare areas in between, it means a sharp decrease in lymphocytes(**Figure 2**).

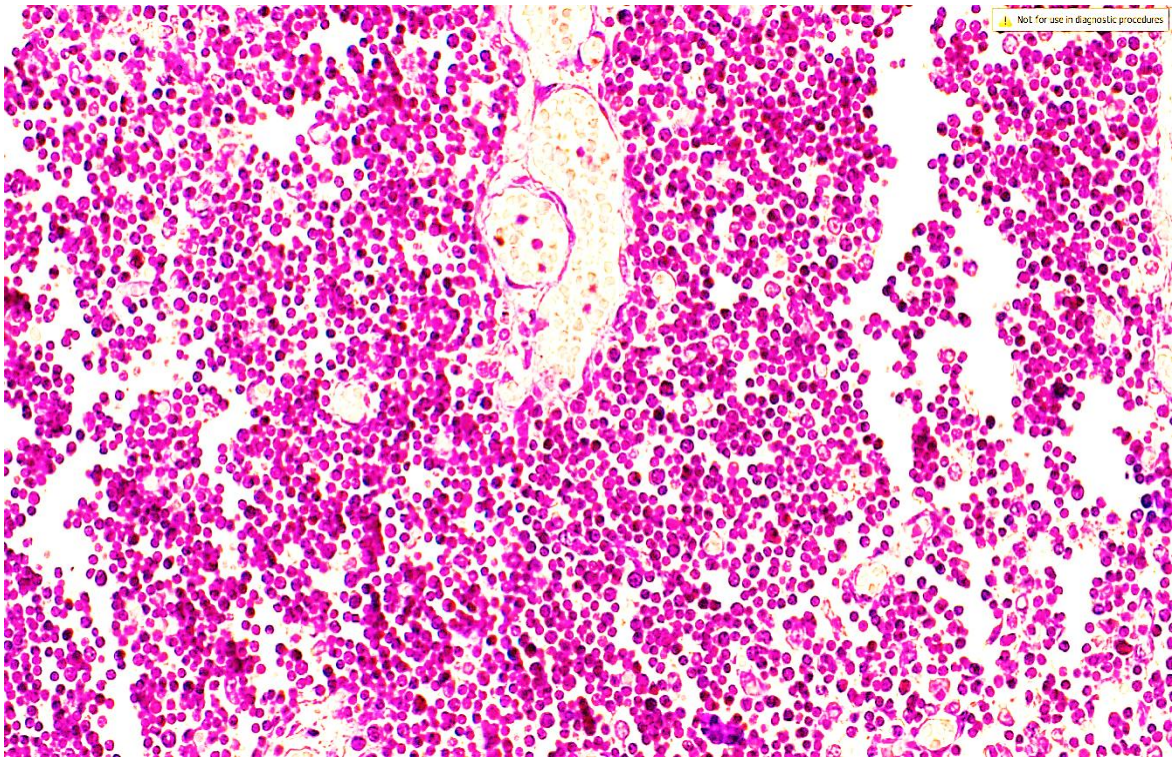

Figure 2. Antenatal death of a baby born at 32 weeks of age. Protocol 40 D. The fullness of the anastomosis of a small-caliber vein and blood vessel in the medulla of the gland and the phenomenon of sludge in erythrocytes are determined (1). It is determined that the swelling that occurred in the small capillaries led to the formation of plasmatic swelling in the thymus parenchyma and disorganization in the stromal connective tissue. A large number of developing Hassal cells are identified (2). Paint G.E. The size is 40x10.

In most of the fragments, it was found that there was a large number of lymphocytes around macrophages, a large number of phagocytosis foci, and a sharp decrease in thymic hormone-producing cells. These changes indicate that the thymus undergoes accidental transformation over time, at different stages in the process. In the postcapillary venules of the cortex, there is a sharp fullness, sedimentation of erythrocytes, swellings in perivascular branches, reticuloepithelial cells have a short thickened appearance, and they have changed dystrophically. Focal accumulation of nanny cells, division of bare branches around, small lymphoblasts were found (**Figure 3**).

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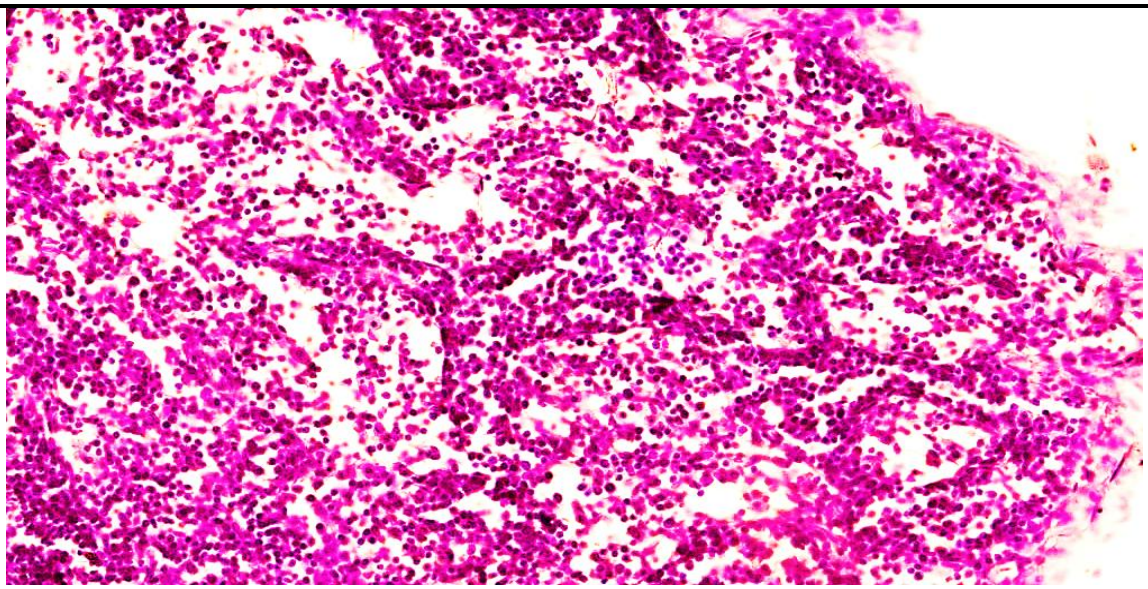

Figure 3. Antenatal death of a baby born at 32 weeks of age. Minutes 21D. In the cortex of the sebaceous gland, the induced apoptosis of small lymphocytes is increased and the process of decortication is developed (1), denudation and disorganization of fibrous structures are clearly described in the stroma. . Paint G.E. The size is 40x10.

This is based on the fact that T lymphocytes migrating from the hematogenous bone marrow to the thymus are coming at a very low level, and the lymphoblasts that have passed through the postcapillary venules of the cortical layer are attracted to the process of macrophage proliferation and induced apoptosis, which means that they have emptied the stroma of the cortical layer (**Figure 4**).

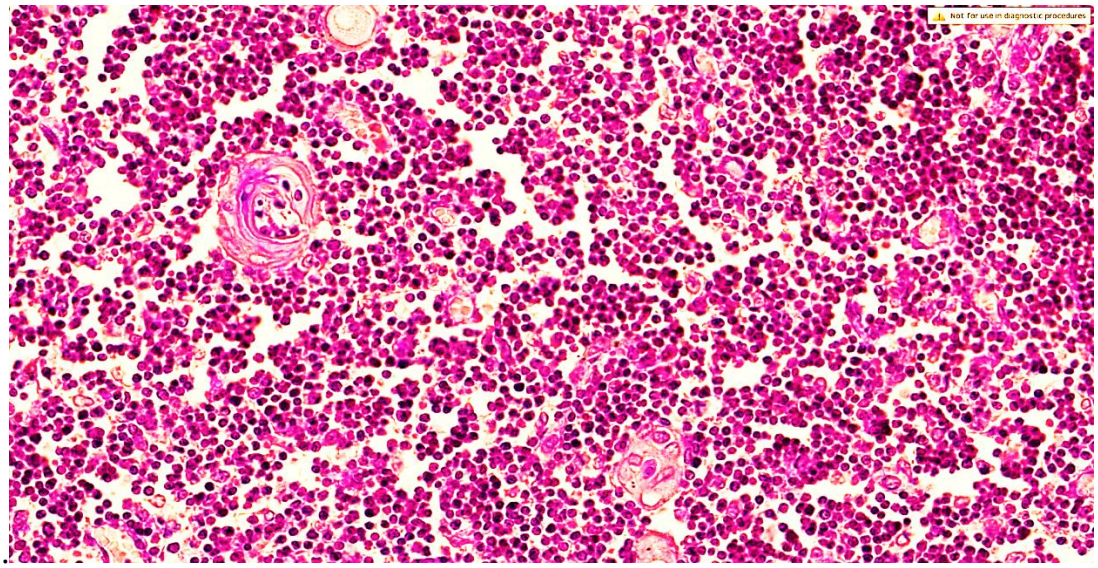

Figure 4. Antenatal death of a baby born at 31 weeks of age. Minutes 13D. In the medulla of the thymus lobe, the formation of massive Gassal corpuscles and the fullness of small-caliber blood vessels are determined (1). Dystrophic and necrobiotic changes are detected in macrophages and reticulo-epithelial cells. Interstitial tumors developed in the stroma and disorganization of stromal fibers are revealed. Paint G.E. The size is 10x10.

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Morphologically, shape changes of all intramural tissue cells of the sebaceous glands are manifested by the reduction of lymphocytes that make up the thymus parenchyma in the form of fibrous structures, the distribution of macrophages along the plasmatic fibrous structures, the increase in the process of induced apoptosis, and the sharp reduction of morphofunctional areas. A small number of dendritic cells means that hematogenous T lymphocytes do not fully recognize histological antigens and the rate of apoptosis is increased(**Figure 5**).

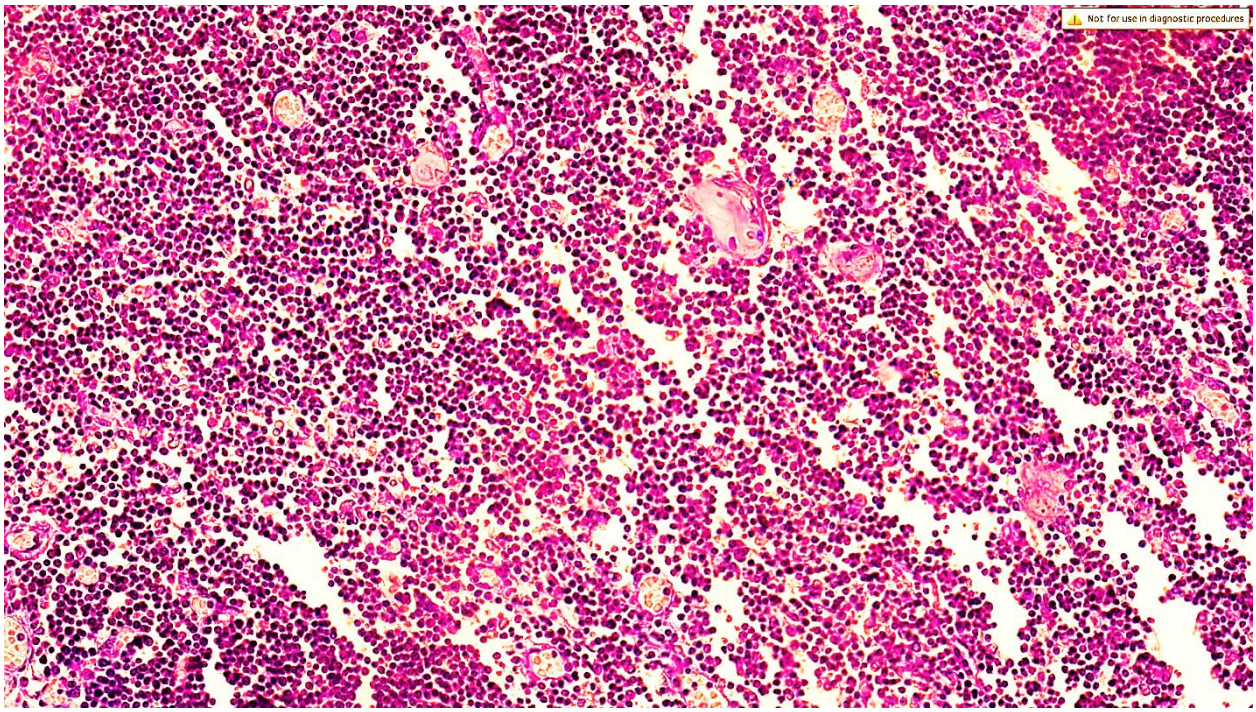

Figure 5. Antenatally dead baby born at 33 weeks of age. Minutes 14D. In the medulla, developing Gassal corpuscles (1), cavities are formed in place of lymphocytes that have undergone induced apoptosis. In the medullary layer, the fibrous structures of the stroma are swollen and disorganized. Fullness is determined in blood vessels of all layers. Paint G.E. The size is 10x10.

Dynamically , the ratio of the cortex and medulla of the thymus is 7/1, the ratio of septa and cells (lymphocytes, reticular, epithelial cells, macrophages) decreases, the formation of interconnected networks of mainly reticular cells, the accumulation of small undifferentiated lymphocytes in condensed foci, the occurrence of gaps around the structure functional spindles and nurse cells are found to be freed around, confirming that the thymus is undergoing involution. Reticuloepithelial cells, which should be triangular in shape, have a small number of lymphocytes around them, have a rounded oval shape, have a loose stroma between mutual anastamoses, and have light cytoplasmic cells on a dark background, reminiscent of a starry sky(**Figure 5**).

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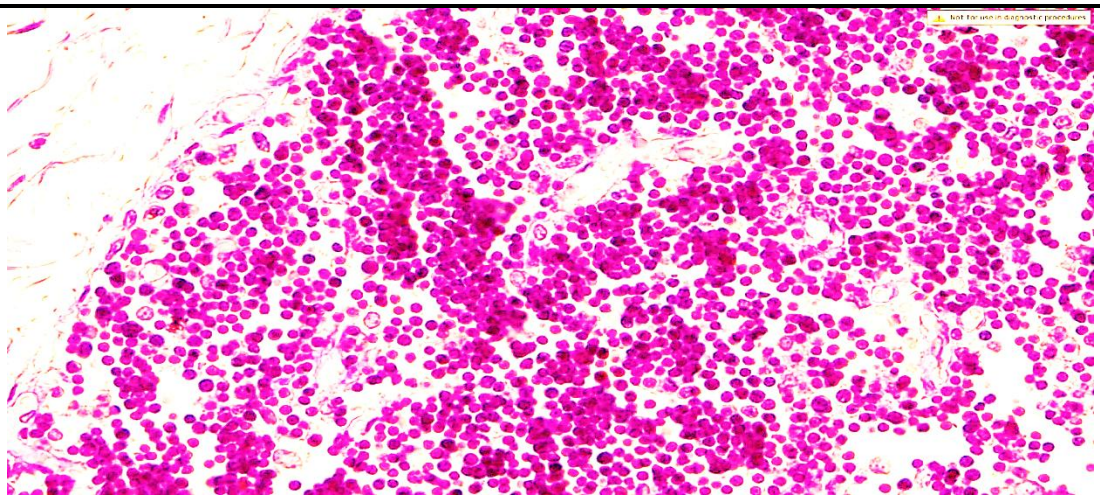

Figure 6. Antenatally dead baby born at 33 weeks of age. Minutes 17D. In the bark layer, small lymphocytes are clustered together, dark hyperchrome-stained nuclear lymphocytes are gathered around reticuloepithelial cells, which means that they are in morphofunctional tension. In the medullary layer, the denuded foci of the stroma are identified. Fullness is determined in blood vessels of all layers. Paint G.E. The size is 40x10.

Reticuloepithelial cells were characterized by tumor formation between anastamosis and septa, plasmatic staining and disorganization of fibrous structures, hematogenously migrating lymphoblast cells meeting with induced apoptosis in these areas, large number of unswollen nuclei. One of the most interesting aspects is that at 28-33 weeks, differentiation areas in the corticomedullary branch of the thymus were not detected (**Figure 7**)...

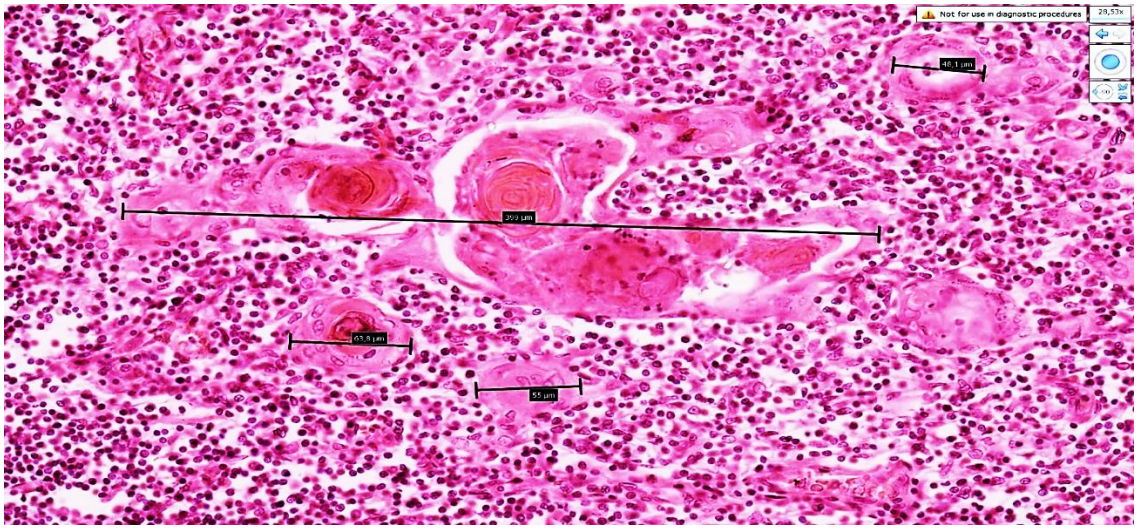

Figure -7 . Antenatally dead baby born at 33 weeks of age. Minutes 29D. In the medullary layer of the thymus fragment, interrounded foci of large-sized giant Gassal corpuscles are identified (1), in the cortical layer, the growth of the trabecular barrier up to the medullary layer and the swellings formed in the interval are determined. In the medullary layer, the denuded lesions of the stroma are identified. Fullness is determined in blood vessels of all layers. Paint G.E. The size is 40x10.

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A large number of foci of horn dystrophic changes of the epithelial cells in the Hassal bodies of the bark branch were detected. The presence of reticular cell anastomosis foci around Gassal corpuscles and the appearance of pearl-like changes, influencing factors indicate that premature involutional changes occurred before the fetal ontogeny of the thymus(**Figure7**).

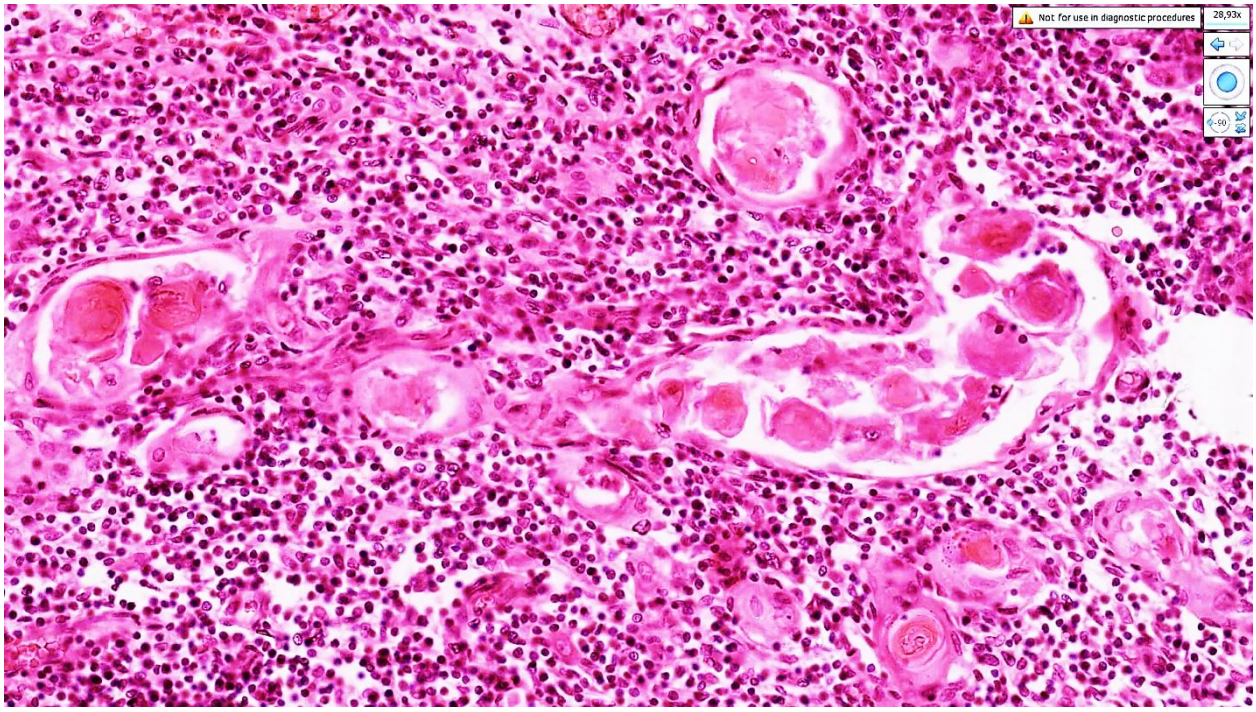

Figure 8. Antenatally dead baby born at 33 weeks of age. Minutes 11D. In the structure of the thymus fragment, Gassal's corpuscles (1) of various sizes, which develop without selection of boundaries, ingrowth of the trabecular barrier in the cortical layer to the medullary layer, and tumors formed in the interval are determined. In the medullary layer, the denuded lesions of the stroma are identified. Fullness is determined in blood vessels of all layers. Paint G.E. The size is 10x10.

That the fulness of the capillaries in the cortex and medulla and the splitting of the erythrocyte sludge phenomenon, which means that the blood circulation is disturbed, and it is manifested by the sudden expansion of the anastamosed branches of the small-caliber vein blood vessels. It was found that this process, in turn, continued with interstitial swellings in the thymus parenchyma, increased apoptosis of small lymphocytes, reticulosis of reticulocytes, and the formation of a large number of anastamotic foci. In the medulla, it was determined only in the central lobes of the thymus, occupying a small area , and a large number of 15-25 small Gassal cells were found at a magnification of 400x. It was found that the minimum size of Gassal bodies was 35.12±2.31 µm, the average size was 74.22±5.16 µm, and the maximum size was 251.21±11.2 µm (**Figure 8**). The fact that Gassal's corpuscles in the medulla and cortex are located in any areas without border selection, the presence of a few foci of dendritic cells and the absence of lymphocytes around them confirm that involution is formed in the thymus as an irreversible process. Epithelial cells and fibrous structures that have not yet undergone complete necrosis were found in the composition of Gassal bodies, and some of them were petrified.

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webofjournals.com/index.php/5

REFERENCES

1. Biloshapka V. A. et al. Modern aspects of the pathomorphology of congenital cytomegalovirus infection in children of the first year of life (case report) // Medical and social problems of the family. - 2021. - V. 26. - No. 2. - P. 99-104.
2. Borodin, Yu.I. Peripheral lymphoid structures: formation and function / Yu.I. Borodin, O.V. Gorchakova, V.N. Gorchakov // Morphology. - 2016. - V. 150, No. 4. - P.90-96.
3. Bocharova O.A., Karpova R.V., Bocharov E.V., Vershinskaya A.A., et al. β2-integrins LFA-1, MAC-1 - a target for enhancing immunity against tumors.// Russian Journal of Biotherapeutics. 2020;19(1):53–8.
4. Bosin V.Yu., Verbitskaya A.I., Solomin Yu.A. Comparative assessment of ultrasound and sectional examination data of the thymus gland in children // Ultrasound diagnostics in obstetrics, gynecology and pediatrics. No. 3. P. 40-47.
5. Bubnova N. V. et al. Changes in the cellular composition of the rat thymus 90 days after the introduction of urethane against the background of selenium intake // Journal of Anatomy and Histopathology. - 2024. - V. 13. - No. 1. - P. 19-27.
6. Verbitskaya A.I., Solokhin Yu.A., Nazarova N.F. Features of echography of the thymus gland in children at different age periods // Ultrasound and functional diagnostics. 2001. No. 3. P. 34-39.
7. Volkov V.G., Kastor M.V. Modern views on the problem of classification and determination of the causes of stillbirth // Russian Bulletin of Obstetrician-Gynecologist. 2020. Vol. 20. No. 3. P. 29-3.
8. Galeeva E.N. Characteristic features of the formation of the topography of a number of organs of the human immune system in the early fetal period of ontogenesis // Bulletin of new medical technologies, 2011. Vol. 18 No. 2. P. 489-492.
9. Galeeva E. N. Morphological characteristics of functional zones of the human thymus in the intermediate fetal period of ontogenesis // Orenburg Medical Bulletin. - 2015. - V. 3. - No. 2 (10). - P. 15-19.
10. Grigoriev V.N. Structural and functional relationships between the immune and endocrine systems in young children // Mathematical Morphology: Electronic Mathematical and Medical-Biological Journal. 2007. Vol. 6, No. 1. P. 40-50.
11. Grigorieva E. A. Morphology of the human thymus in the early postnatal period of ontogenesis / E. A. Grigorieva, S. V. Grigoriev, E. R. Skakovsky // International academy journal Web of Scholar. – 5(23), Vol.2, May 2018. – pp. 11-15.
12. Donetskova A.D., Nikonova M.F., Vaganov P.D., Mitin A.N. Features of T-lymphopoiesis in children with thymomegaly //Molecular diagnostics 2017: collection. works of IX All-Russian. scientific-practical conf. with international participation. M., 2017. pp. 512-513.
13. Drandrova E. G. et al. Immunohistochemical studies of the cellular composition of the thymus during carcinogenesis in conditions of congenital immunodeficiency // Modern problems of science and education. - 2015. - No. 3. - P. 193-193.
14. Erofeeva, L.M. Morphology of the thymus during modeling of extreme effects: hypergravity, ionizing radiation: author's abstract. dis. ... Doctor of Biological Sciences (03.00.25) / L.M. Erofeeva. - M., 2002. - 312 p.

Web of Medicine: Journal of Medicine, Practice and Nursing
webofjournals.com/index.php/5

15. Zabolotskikh T. V., Grigorenko A. A., Gorikov I. N. Changes in the ultrasound and morphological structure of the thymus gland in newborns with intrauterine parainfluenza types 1 and 3 // Bulletin of Physiology and Pathology of Respiration. - 2013. - No. 50. - P. 94-98.

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