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DYNAMICS OF DEVELOPMENT OF TISSUE STRUCTURES OF THE TRACHEA AND BRONCHI WALL IN THE PERIOD OF SIX MONTHS OF CHILDHOOD

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Abstract: *In this article, the dynamics of tachomyl finding of tissue structures of the trachea and bronchi wall during the period of up to six months of infection, the structure of which was investigated.*

It has been proved that in the period of one month of infants, not all layers of the trachea wall have found a good takomil, in the period up to six months, the covering epithelium is one layer from the multilayer, the connective tissue from which the private plate is not formed, the cartilage rings turn from the sparse chondroid and cellular structure into.

Keywords: *Baby, lung, trachea, bronchi, postnatal ontogenetic, histochemical, histological, hematoxylin-eosin, van-gizon.*

Urgency of the problem: According to world health data, infant mortality is one of the main problems in the world of medicine. Today, despite the fact that the infant mortality rate is 15.6% per 1,000 live births, the birth rate is very low, at 9.1%. In particular, the infant mortality rate in Uzbekistan in 2018 will be 9.8 thousand people. [9]

The number of respiratory bronchioles in newborns is 1.5 million, while in adults it is 14 million. They were found to have a total alveolar area of 2.8 and 75 m2, respectively. . [1-2-4-5-6]

It was recommended that the histological structure of the bronchi be studied first in the mucosa, submucosa, fibrosis, and adventitial layers. [3-10-11]

Respiratory organs are the leading cause of morbidity and mortality among newborns, which occurs in premature infants. [8]In particular, the Resolution of the President of the Republic of Uzbekistan dated 13.02.2019 No PP-4191 "On measures to improve the system of specialized tuberculosis and pulmonology care" is a clear example of this.

A scientific article by a group of scientists (S. V. Klochkova, T. A. Akmatov, N. T. Alekseeva, D. B. Nikityuk 2021) is devoted to the study of quantitative indicators and structure of the age distribution of the main bronchial glands of man. As an object of study, the glands in the walls of the main bronchi, taken as a single complex, together with the lower part of the trachea, including the area of the bifurcation area. [7] However, no morphometric examination was performed in the postnatal ontogenetic stage of the bronchial tree in young children.

The aim of the study: To study the dynamics of the development of tissue structures of the trachea and bronchial wall in infants up to six months.

Research materials and methods: The examination was carried out at the Republican Center for Pathological Anatomy on the carcasses of infants under one year of age 2020-2022. Lungs were studied in the carcasses of children who died as a result of congenital heart defects and other causes, with no disease of the bronchial tubes. Causes of death and underlying disease were identified in forensic medicine and pathological anatomy conclusions. Examination materials were obtained in the following parts of the lung: i.e., the trachea, the right and left lungs, the external and internal bronchi were examined by opening them from the bronchi to the terminal bronchi.In our study, instrumental (using a caliper), general histological and histochemical methods were used. The obtained materials were poured into formalin and then 3-5 μm incisions were made. They were stained by hemotoxylin-eosin, Shik, Van-gizon methods.

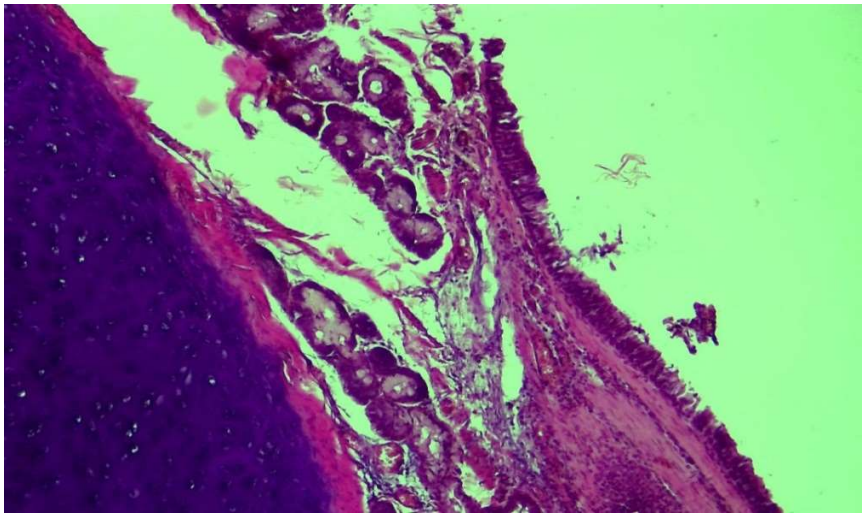
Figure 1. Baby lungs, 3-month period. Measurement of extrapulmonary bronchi using a caliper.

Results: For examination, the trachea (throat) in all infants, pulmonary bronchi in both lungs, interstitial bronchioles, terminal bronchioles, respiratory bronchioles were located directly in the lung tissue, and their diameters were measured.

During the 6-month period of infancy, the trachea, i.e. the walls of the throat wall, is observed to grow rapidly. It is found that the connective tissue of the trachea thickens, the connective tissue increases, the cells decrease, the chondrocytes in the trachea form at a higher level than in previous periods, the interstitial chondroid substance decreases, the surrounding connective tissue tufts thicken.

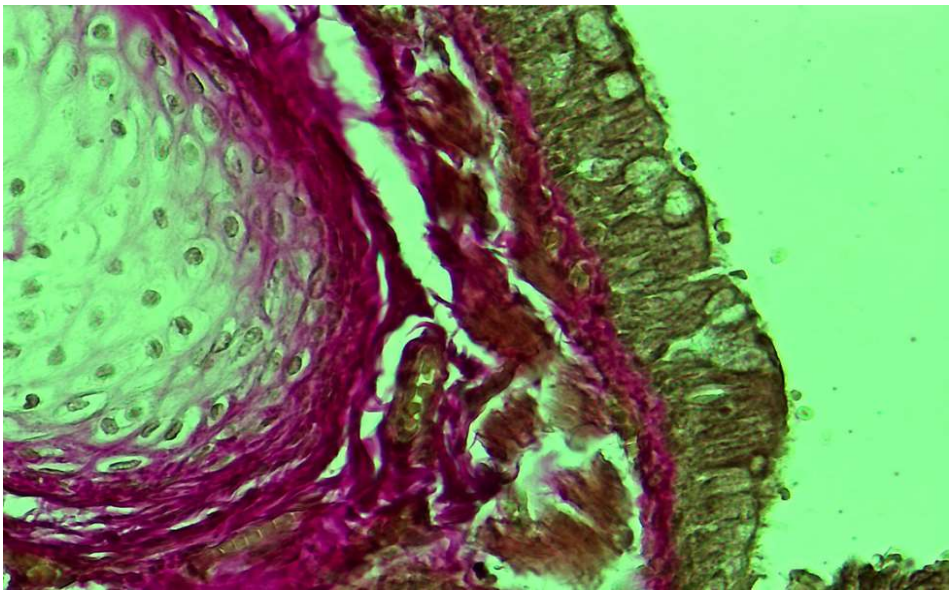
During the 6-month period in infants, it was observed that the folds in the mucous membrane of the trachea almost completely disappeared, and the folds flattened compared to the previous period. During the 6-month period, the mucosal connective tissue plate of the trachea is denser than in the previous period, with an increase in the amount of fibrous structures. By this time, the number of capillaries in the private plate has increased and dilated (Fig. 2).

Figure 2. 6-month period. The trachea, the pelvis is dense, the submucosal glands are developed, the covering epithelium has taken the form of a single layer. Paint: G-E. Floor: 10x40.



At the age of 6 months, when the wall of the trachea of infants is stained by the van-Gizon method, the amount of fibrous connective tissue in the special plate of the mucous membrane is slightly increased and thickened. In the submucosal layer, it is observed that the connective tissue fibers are relatively darkly stained with picrofuxin and consist of tufts located on the wall of the trachea, enclosing circular and glandular structures (Fig. 3).

Figure 3. 6-month period. In the trachea, the connective tissue fibers in the submucosal layer are enlarged and dense. Paint: van Gizon. Floor: 10x40.

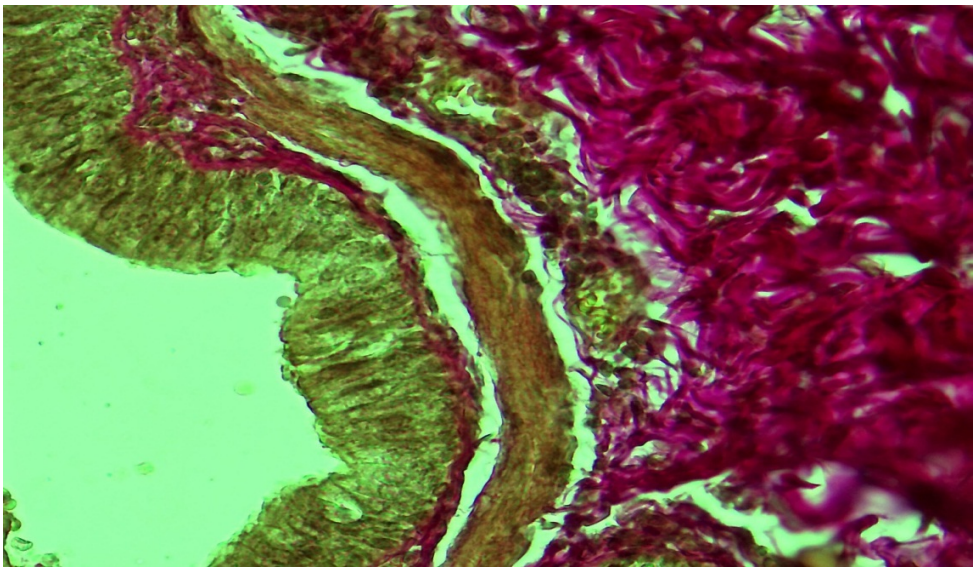


Bronchi of the lungs.

6-month period. By this stage of the examination, it was determined that the bronchi of the inner lung had retained their tubular shape, were slightly elongated, averaged 4.4 ± 0.9 cm, and the width of the cavity was on average 0.26 ± 0.2 cm. The thinness of the wall is preserved, the mountain rings are relatively perfect, the wall is found to be thin and soft. Uncle rings are found to consist of several pieces.

When the inner bronchial wall was stained by the van Gizon method, a relatively increased amount of connective tissue fibers dyed a dark reddish-brown color with all layers, i.e. the mucous membrane special plate, the subcutaneous layer, the articular arthroplasty, and the outer surface covering the connective tissue fibers with picrofuxin (4). -picture).

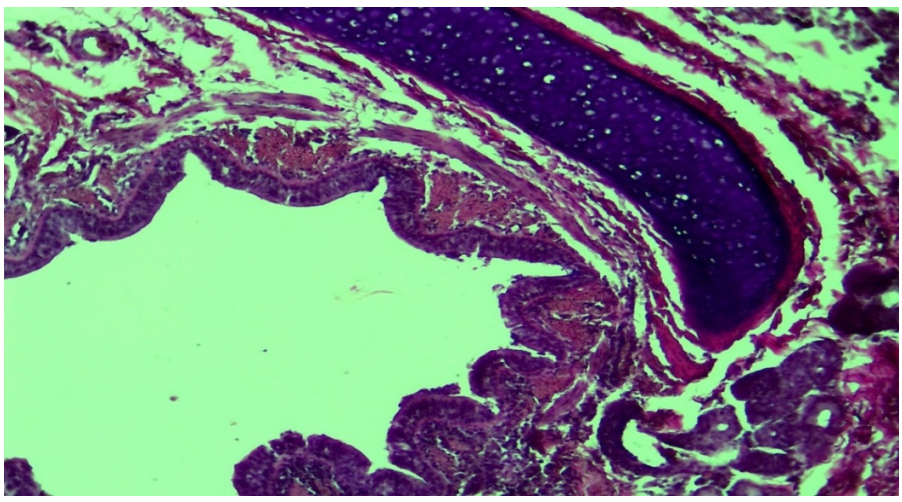
Figure 4. Lung bronchus, 6-month period. Around the uncle rings, the amount of dense collagen fibers in the submucosal layer is relatively increased. Dye: van-Gizon method. Floor: 10x40.



Fractional bronchioles. 6-month period.

Microscopic examination of the pulmonary bronchioles of 6-month-old infants showed that they were observed to be located between segments of lung tissue. It is observed that the uncle rings differ from the bronchi and consist mainly of large and small pieces located separately. The composition of the uncle is also composed of many and small chondrocytes, the intermediate substance is found to be relatively dense and dark-stained chondroid substance. It was found that the covering epithelium was larger than in previous periods, took on a cylindrical shape, and that the cytoplasm was enlarged and that there was a mucous substance on its surface (Fig. 6).

Figure 5. Fractional bronchiola, 6-month period. The covering epithelium is cylindrical, the special plate is rich in fibers. Paint: G-E. Floor: 10x40.



Bronchiola terminal. 6-month period.

During the 6-month study period, microscopic examination of the terminal bronchiola wall structures showed that the covering epithelium was thinner, smaller in size, and prism-shaped than in previous periods. When the wall of the terminal bronchiole is examined under a large lens under a microscope, it is found that the covering epithelium is relatively small, prismatic, multi-layered structure.

Histochemical examination of the connective tissue fibrous structures in the wall of the terminal bronchiola at 6 months of age showed that the alveolar tissue surrounding the outer layer of the posterior epithelium was relatively enlarged and densely packed with picrofuccin-positive stained fibers. It is found that these connective tissue fibrous structures are relatively thickened towards the blood vessels around the bronchioles and that the vascular wall is fused with the connective tissue fibers (Fig. 7).

Figure 6. Bronchiola terminal. 6-month period. In the wall of the bronchioles, fibers stained positively with picrofuxin are found to be scarce and abundant around the blood vessels. Dye: van-Gizon method. Floor: 10x40.

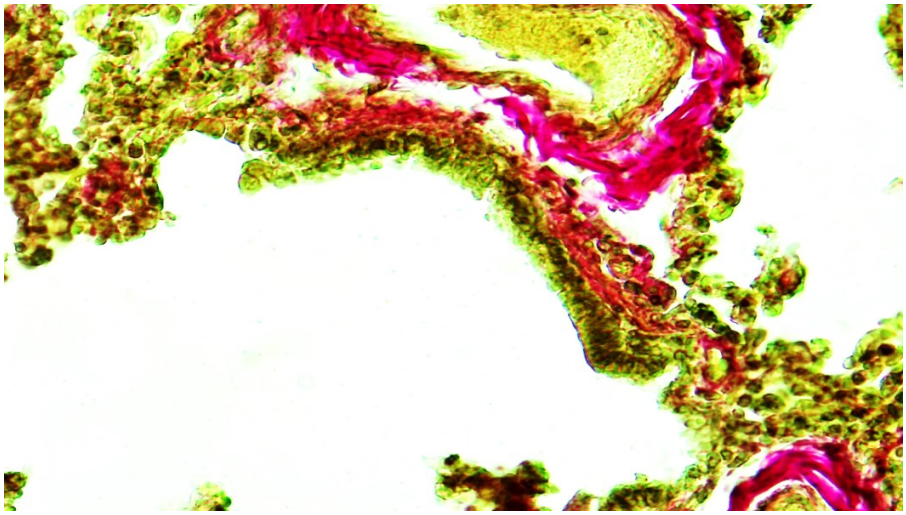


Table 1. In our study, the size of the bronchi in the lungs was determined in 6-month-old infants

Left lung	Piece bronchus	segmental bronchus	subsegmental bronchus	bronchial terminal
Top section	2100± 45 мкм	1160±50 мкм	480± 10 мкм	200± 10 мкм
Bottom section	1900± 30 мкм	1400± 120 мкм	980± 27 мкм	340 ± 8 мкм

2-table

Right lung	Piece bronchus	segmental bronchus	subsegmental bronchus	bronchial terminal
Top section	2030± 40 мкм	1100±34 мкм	420± 10 мкм	180± 10 мкм
Middle section	1880± 35 мкм	1250±60 мкм	600± 12 мкм	250± 9 мкм
Bottom section	1750± 24 мкм	1400±120мкм	980± 27 мкм	340 ± 8 мкм

Conclusion: From one month of infancy, all layers of the trachea and bronchial wall are composed of immature tissue, up to six months of the epithelium is multilayered, proved.
At one month of age, the walls of the terminal bronchioles are hemispherical, with a single layer of cylindrical epithelium on one side and alveoli on the other side.

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