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Research Article

# MORPHOLOGICAL FEATURES OF THE BRONCHUS OF THE LUNG IN CHILDREN FROM 8 TO 12 YEARS OF AGE

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## ABSTRACT

The pulmonary vessels and their endothelium plays the role of a physiological barrier for numerous biologically active substances, then the epithelium and connective tissue basis of the airways perform a barrier-protective function in relation to various environmental factors [1]. The bronchial secret produced by the mucous membrane is the result of the complex integration of the transudation of the plasma components of the blood, the secretory activity of the bronchial epithelium, glands, the cells of the connective tissue and blood cells (neutrophils, fat cells, eosinophils, macrophages, etc.). From the presented few literature presented, it becomes obvious that the structure of the lung function is closely integrated with the lymphatic system. Located in the immediate vicinity of both peribronchial and alveolar blood capillaries, the flow of lymph goes along the bronchial tree and along the subpleural tissue, in its most lungs and the lymph nodes located here, as well as tangential along the plane of the pleura [2.3] .

Based on the foregoing, the purpose of this work is to establish in posttal ontogenesis the laws of the formation and involution of bronchial vascular and lymphatic systems in a person, epithelial connective tissue relationships in the air and respiratory parts of the lung (1.4).

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KEYWORDS

Light bronchi, morphology, morphometry.

## INTRODUCTION

**Purpose:** to evaluate the morphometric structure of the bronchus of the lungs in children aged 8 to 12 years

**Tasks:** to study the dynamics of morphometric parameters and the structure of the lung bronchus at the second childhood.

## METHODS

experiments and research were conducted at the Republican Center for Pathological Anatomy.

The study of the extra- and intraorgan vessels of the bronchus of the lungs and histological features was carried out on 20 troupes of children aged 8 years of birth to 12 years old, who died from injuries or diseases not associated with the pathology of the lung or heart. In the protocols, the cause of death was established on the basis of the results of forensic openings and protocols of pathological studies. Given the location of the main bronchi outside the parenchyma of the lungs, as well as the initial branches and final mergers, respectively, the pulmonary arteries and veins, the lymph vessels and nodes, the lung was prepared after its isolation together with the heart. A histological and morphometric examination of the pathological material obtained from parts of all patients (lungs, bronchi, heart, kidneys, liver, brain) was carried out.

To study morphology, the relationship of epithelial connective and muscle formations, branches of the bronchi, the lung fixation was carried out by 10%formalin, which was introduced into the main (right, left) bronchus and pulmonary artery, under a pressure of 25-30 mm Hg. Art. After that, the lung plunged into the same formalin solution for 5-7 days. After washing in running water, the main, shared, segmental and subsequent branches of the bronchi was prepared. Pieces for the study were cut out throughout the above bronchi, as well as their division areas into subsequent generations. After wiring on alcohols of increasing concentration and pouring into paraffin, sections 5-7 μm thick were stained with Toluidin blue, hematoxylin-eosin, fuchsiline in van gizon, and chic-reaction was carried out. Based on the viewing of drugs painted with the above methods, the morphology of the connective tissue and the muscles of the mucous membrane and submucosal

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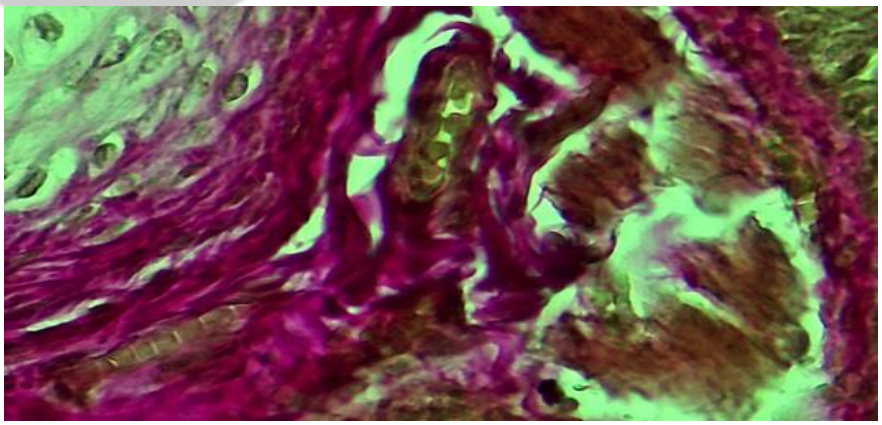
membranes, their changes in the dynamics of age, and local changes in the bronchial tree were studied.

Using an eyepiece-micrometer of MOV X15, the diameter of the bronchi, the thickness of the shells was measured, the development coefficient of muscle plate and elastic structures in the own plate of the mucous membrane was calculated.

## RESULTS

During the second childhood, the diameter of the main bronchus increases to 4430 ± 67 microns with a thickness of 1475 ± 41 microns. The mucous membrane consisting of epithelium, its own and muscle records, is 215 ± 7.5 microns. A multi -row attendant epithelium with a height of 29.7 ± 0.9 microns, which is essential compared to the previous juice of research changes. Own plate with the thickness of MKM is formed by a loose connective tissue, where together with fibroblasts, obese, plasma cells, lymphocytes are detected longitudinally and obliquely oriented bundles of elastic and collagen fibers. In the membranous part where the folds are formed, powerful bundles of longitudinal elastic fibers are found. The muscle plate, as in the previous periods, is thin almost throughout the entire perimeter of the bronchus (105 ± 8.6 microns) significantly increased into its membranous parts, where longitudinal and circular bundles are located. The composition of the longitudinal bundles detected in the central part of the mere bundles has a relatively powerful longitudinal fibrous-elastic weight.

The submucosal membrane throughout consists of loose connective tissue, consisting of collagen and elastic fibers, fibroblasts, a network of blood and lymph vessels and alveolar-tubular glands (Fig. 1.).



Rice. 1. A fragment of the main bronchus consisting of a multi -row ciliated epithelium, bundles of elastic fibers, muscles, alveolar azinuses in a child during a second childhood period. Coloring: Fuxelin + Van Hizon.

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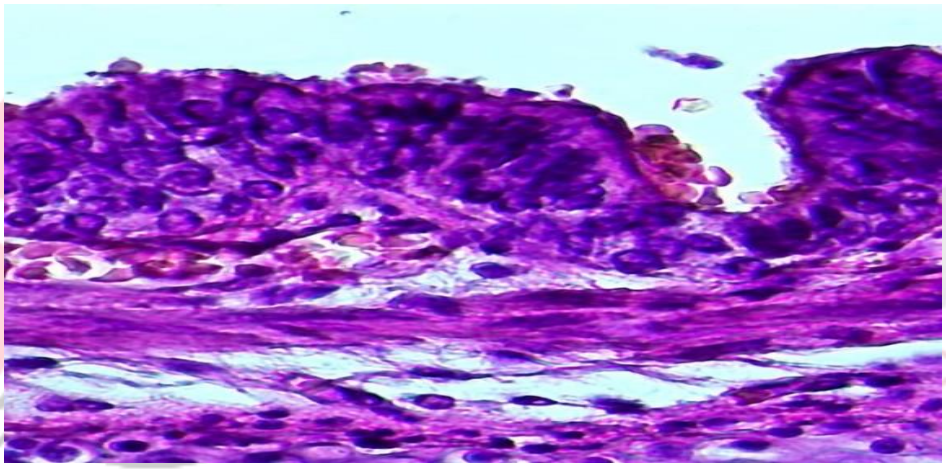
The fibrous-chorn shell consists of unmarked rings of the hyalin cartilage and a relatively dense fibrous plate formed by coarse bundles of collagen fibers. Elastic fibers are relatively small, rarely found among collagen fibers.

The adventitic shell consists of loose connective tissue that passes to the surrounding tissue contains mainly bundles of collagen fibers, fibroblasts, single macrophages and other connective tissue cells.

During the branching of the main bronchus, two almost the same diameter of the shared bronchus of the upper and lower and lower -eleum are formed 3150 ± 55 and 3210 ± 55 μm (P> 0.05), respectively. With an almost equal value of the height of the epithelial lining (27.0 ± 1.6 and 26.3 ± 1.3 microns), its own and muscle plates in the upper -oral bronchi are significantly thinner than in the lower -nor (63.0 ± 7.4 and 83, 2 ± 5.1;



Rice. 2. Pronounced longitudinal folds of the mucous membrane of the shared bronchus, consisting of a multi -row ciliated epithelium of bundles of elastic fibers in its own plate and circularly located muscles during the second childhood period.Coloring: Fuxelin + Van Hizon.

It must be assumed that both bronchi are characterized by functional features: on the one hand, the air, constantly making movements in both directions, on the other, is the vascular system of a small circle of blood and lymph circulation, moving regardless of the excursion of the lung. Own plate, as noted earlier, is formed by loose connective tissue, rich in fibroblasts, lymphocytes, plasmocytes, and macrophages are occasionally found. Powerful bundles of elastic fibers are intertwined with bunches of collagen fibers, which are oriented longitudinally.

The muscle plate around the entire perimeter of the bronchi is located in 2-3 layers, circular. Only in the inter

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-chrysha spaces are they oriented longitudinally. In the submucosal membrane of the connective-tissue cells relatively smaller, blood and lymph vessels, collagen and elastic beams of fibers, slices of mucous and white alveolar-puffy glands are clearly detected. The fibrous-chryashny layer in structure was not much different from that in the main bronchi.

It should be noted that the formation of lymph nodules is not rarely noted in the formation zone of the upper and lower bronchi.

The upper -eleic bronchus, branching, forms several segmental, the diameter of which ranges from 980 to 1400 microns, making up an average of 1120 ± 28 microns. The thickness of the layers varied from 700 to 1200 microns. At the same time, the epithelium, its own, muscle plates of the mucous membrane were 21.0+1.1, 54.2 ± 4.3 and 72.1 ± 6.2 microns. Compared to the previous period of research, as can be seen from the results, the muscle plate is reliably increased, other structures of reliable changes do not undergo.

Histologically visible restructuring in the epithelial layer and its own plate is not noted. The muscle plate becomes more powerful, consisting of several layers of smooth muscles.

In the fibrous-chryshy shell, the cartilage is located in the form of plates and a half-eyed, the fibrous membrane is formed by collagen and elastic fibers. The adventive shell, as before, contains loose connective tissue.

With the same structure, the lower -eater segmental bronchi have a relatively large diameter: its values range from 2300 to 2550 microns (on average 2410 ± 41.2 μm). Epithelium, own and muscle records are less than similar layers in the upper native segments by 20.5; 45.8 and 37.4%.

Thus, with the same microscopic structure of the layers of the upper and lower and lower segmental bronchi, the thickness of each of the layers is larger in the upper novel, which, apparently, is due to the features of gas exchange and microcirculatory channel.

Subseggmentary bronchi formed from the corresponding upper and lower segmental bronchus, in the second childhood, also have the same type of histological structure. However, their diameter is larger, the epithelium, its own plate and muscle plate are thicker in the lower lobe. In subsigmental bronchi, folding, bunches of longitudinal collagen and elastic fibers in their own plate are expressed. The muscles are circularly located, more developed than in larger bronchi. In the course of the muscles, there are circular elastic fibers. The glands are tubular-alveolar, poorly developed. Occasionally there are small clusters of lymphoid tissue.

Membranose bronchi, both in the upper and in the lower lobe, have almost the same structure and

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morphometric parameters of the mucous membrane. The diameter of their clearance ranges from 300 to 450 microns. The epithelium is thinner to 10-11 microns, has a cubic shape. The own plate is sharply thinned, the muscle plate is formed by the circular beams of smooth muscles and has a thickness of 1-32 µm.

Thus, during the second childhood (8-12 years), with moderate growth of the bronchial tree, no significant structural restructuring was noted. With morphometric differences in shared, segmental and subsigmental bronchi, their membranous department has no differences. In the lower -eater bronchi, the epithelium, its own plate and muscle plates are more pronounced than in the upper -oral. The elastic and muscle frame become more developed than in the previous period of research.

## CONCLUSIONS

1. In the period of the second childhood, in the Nizhnedovo bronchus - the epithelium, its own plate and muscle plates are more pronounced than in the upper novel. The elastic and muscle frame become more developed than in the previous period of research

2. From 8 to 12 years of life, with the same microscopic structure of the layers of the upper and lower and lower segmental bronchi, the thickness of each of the layers is larger in the upper novel, which, apparently, is due to the features of gas exchange and microcirculatory channel.

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