

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ  
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»**



## **МАТЕРІАЛИ**

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## **DEVELOPMENT OF PULMONARY ARTERIES IN HUMAN EMBRYOS**

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**Introduction.** One of the important directions of the morphological research is the study of the peculiarities of development and the formation dynamics of separate structures of the organs of the respiratory system in the process of human ontogenesis. Therefore, it is an urgent task to solve the basis of establishing mechanisms, causes of occurrence, methods of diagnosis, treatment and prevention of acquired diseases and congenital pathologies of respiratory organs.

**The aim of the study.** Therefore, the purpose of this study was to investigate the peculiarities of intrauterine formation of pulmonary arteries in human embryos.

**Material and methods.** The study was performed on human embryos of 42, 45, 48, 54 and 56 mm parietal-coccygeal length (PCL).

**Results.** On the preparations, the posterior segmental artery departs directly from the posterior semicircle of the pulmonary artery 2.0-3.0 mm distal to the upper lobe and is the only vessel supplying the indicated segment. It goes backwards and laterally, dividing into two or three subsegmental branches, which are located dorsally of the bronchial trunks of the same name. Quite often, the posterior segment, even in the presence of the segmental artery of the same name, is entered by an additional arterial branch departing from the middle lobe (anterior zonal) or directly from the pulmonary artery. The diameter of segmental arteries varies from 0.7 to 1.0 mm, subsegmental – from 0.4 to 0.5 mm. The middle lobe artery departs from the pulmonary artery above the bronchus of the same name, is directed laterally, forming a sharply defined arc with a convexity facing back, and is divided into two segmental branches - lateral and medial, which go dorsally and slightly above the bronchus of the same name. The length of the medial lobe artery varies from 2.2 to 2.5 mm, the diameter – from 1.2 to 1.5 mm, the diameter of its segmental branches is 0.7-0.9 mm.

Distal 1.0-1.5 mm from the point of departure of the middle lobe artery, the pulmonary artery gives off the posterior zonal artery, which is directed back and is located above, and then dorsal to the bronchus of the same name, dividing into 2-3 branches that have 0.4-0.6 mm in diameter. The length of the posterior zonal artery varies from 1.2 to 1.7 mm, the diameter – from 0.7 to 0.9 mm.

The lower zonal artery is 2.0-2.5 mm long (diameter 1.7-2.0 mm) downwards and, similarly to the bronchus of the same name, divides into two or three branches. More often, the lateral and posterior-basal segmental arteries depart through a common trunk, the named vessels depart separately much less often, and the medial- and anterior-basal arteries have a common trunk, and only in one case the inferior zonal artery branches according to the loose type into four segmental arteries - medial, anterior, lateral- and posterobasal. The left pulmonary artery has a length of 2.4-2.8 mm (diameter 1.2-1.6 mm), goes laterally and backwards, lying on the upper semicircle of the main bronchus of the same name, and there it divides into two trunks – upper and lower.

The upper trunk of the pulmonary artery, according to the distribution area of its branches, corresponds to the upper lobar (superior zonal) artery of the right lung and is divided into three segmental arteries – apical, posterior and anterior, the diameter of which ranges from 0.6 to 0.8 mm. The diameter of segmental arteries ranges from 0.9 to 1.0 mm. Further branching of blood vessels and complication of their wall structure is also observed.

**Conclusions.** As a result, during this period the wall of the pulmonary artery, its partial, segmental and subsegmental branches consist of well-defined three membranes – inner, middle and outer – characteristic of vessels of definite organs; intralobular arteries still have a primitive structure and their wall is represented by endothelium and several layers of cells (type smooth muscle), located circularly; the outer membrane passes into the surrounding connective tissue of the lung without a sharp demarcation.