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PATHOMORPHOLOGY OF PULMONARY EMBOLISM AFTER SURGERY FOR CONGENITAL HEART DEFECTS

Sadiev Erali Samievich
BukhSMI, Republican Scientific Center for
Emergency Medical Care, Bukhara branch

Summary
A big problem remains the problem of the occurrence of complications from the bronchopulmonary system, risk factors, immediate causes and clinical and morphological manifestations that develop after cardiac surgery. Among the causes of death in patients after heart surgery, along with heart failure, respiratory diseases occupy the main place [A. Atasever et al., 2006]. This study examines the pathological anatomy of pulmonary embolism that develops after surgery for congenital heart defects.

Keywords: heart, congenital defects, surgery, complications, thromboembolism, lung tissue.

YURAK TUG‘MA NUQSONLARI JARROHLIGIDAN KEYIN YUZAGA KELADIGAN O‘PKA ARTERIYASI TROMBOEMBOLIYASI PATOMORFOLOGIYASI

Sadiyev Erali Samiyevich
BuxDTI, RSHTYOIM Bux.filiali

Annotatsiya
Kardioxirurgiya amaliyoti o‘tkazilgandan keyin rivojlanadigan bronx-o‘pka tizimidagi asoratlarning uchrash darajasi, xavfli omillari, bevosita sabablari va klinik-morfologik namoyon bo‘lishi masalasi katta muammoligicha qolmoqda. Yurak jarrohligidan keyin kasallarning o‘lim sabablari orasida yurak yetishmovchiligi bilan bir qatorda nafas tizimi kasalliklari asosiy o‘rinni egallaydi [A. Atasever et al., 2006]. Ushbu tadqiqotda yurak tug‘ma nuqsonlari jarrohligidan so‘ng rivojlanadigan o‘pka arteriyasi tromboemboliyasining patologik anatomiyasi o‘rganilgan.

Kalit so‘zlar: yurak, tug‘ma nuqsonlar, jarrohlik, asoratlar, tromboemboliya, o‘pka to‘qimasi**.**

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ПАТОМОРФОЛОГИЯ ТРОМБОЭМБОЛИИ ЛЕГОЧНОЙ АРТЕРИИ ПОСЛЕ ОПЕРАЦИИ ВРОЖДЕННЫХ ПОРОКАХ СЕРДЦА

Садиев Эрали Самиевич
БухГосМИ, РНЦЭМП Бух.филиал

Резюме
Большой проблемой остается возникновения осложнений со стороны бронхолегочной системы, факторов риска, непосредственных причин и клинико-морфологических проявлений, развивающихся после кардиохирургических вмешательств. Среди причин смерти больных после операций на сердце наряду с сердечной недостаточностью основное место занимают заболевания органов дыхания [А. Атасевер и др., 2006]. В данном исследовании исследуется патологическая анатомия тромбоэмболии легочной артерии, развивающейся после операций по поводу врожденных пороков сердца.

Ключевые слова: сердце, врожденные пороки, хирургия, осложнения, тромбоэмболия, легочная ткань.

Relevance of the Topic

Congenital heart defects are the most common, accounting for 30% of all birth defects, and are the third most common after musculoskeletal and central nervous system defects (6). The most common congenital heart defects include: ventricular septal defect - 15-23%; transposition of trunk vessels - 9-20%; Tetrad of Fallo - 8-14%; aortic coarctation - 6-15%; patency of arterial flow - 6-18%; septal wall defect - 2.5-16%; narrowing of the aorta - 2-7%; pulmonary artery narrowing – 6.8-9%.
Children with congenital heart defects actually develop one or another pathology in the respiratory system. Respiratory system diseases are detected in 87.0% of all patients with congenital heart defects. Pulmonary artery thromboembolism is the next most common, and is found in 03% to 9.5% (5, 6, 8). At the same time, the mechanisms of pulmonary artery thromboembolism, which develop during surgical treatment of congenital heart defects, and pathomorphological characteristics have not been fully studied.

Material and Methods

As the material of this scientific research, the data of the autopsy examination of 51 children's corpses, which were carried out at the Center of Pathological Anatomy of

the Republic of Uzbekistan SSV during the years 2020-2021, were taken. First, the clinical-anamnestic and laboratory-surgical data in the history of the disease were analyzed. Here, the types of congenital heart disease were determined based on clinical diagnosis and divided into groups according to the international classification. Complications, consequences, especially bronchopulmonary complications developed in the children's organism after the type of surgical procedures performed in the clinic, i.e. radical, palliative, physiological methods, were studied and put into a single system. Pulmonary artery thromboembolism was detected in 21 of the total 72 cases, i.e., after surgery to correct congenital heart defects. At autopsy, the large branch, small branches, and arterioles of the thromboembolized pulmonary artery were excised together with the lung tissue. These sections were frozen in 10% formalin dissolved in phosphate buffer for 48 hours. After washing in running water for 3-4 hours, they were dehydrated in alcohols and chloroform, paraffin with wax was poured, and bricks were prepared. Sections of 5-7 μm thickness were taken from paraffin blocks and stained with hematoxylin and eosin. NLCD-307B brand light microscope was studied under 10, 20, 40 lenses, and data-rich areas were photographed.

Research Results and their Discussion

Autopsy examination of the corpses of those who died of complications after surgical procedures for various variants of congenital heart defects were performed at UzR SSV RPAM, and when analyzed clinically and morphologically, it was found that pulmonary artery thromboembolism developed in 21 cases out of a total of 72 cases.

The study of advanced pathomorphological changes in the lung tissue showed that in cases where the thromboembolism is located in the main branches of the pulmonary artery, the lung is suddenly enlarged and heavy due to scattered edema and hemorrhage, and the tissue has a different color. it is determined that it is pale-gray in color only due to the development of swelling. Thromboembolism, which is located in the main branch of the pulmonary artery entering the lung, often fills the vessel cavity, obturates it and penetrates into the branches like a pan. The external appearance of the thromboembolus is dark red (Fig. 1), and in some places, it is found that there are foci of a lighter appearance, and the outer surface is uneven and bumpy. When the thromboembolus is removed from the pulmonary artery and the inner surface of the vessel is examined, it is determined that there are numerous and almost diffuse hemorrhages. It is found that the connective and adipose tissue around the vein is severely swollen. In cases where the thromboembolism is located in the branches of the pulmonary artery entering the lung lobes, it is observed that dark red

infarct foci appeared in the central part of the lobes of the lung tissue, and only the swelling process developed in the peripheral parts of the lobes. In the cases of thromboembolism of lung tissue arterioles and precapillaries, it is determined that a large number of red infarcts with small foci have appeared in the lung tissue, in some cases they are located separately, in other cases they are combined with each other. The following changes were found when the vessels and lung tissue affected by thromboembolism were studied at the microscopic level. It is determined that the thromboembolic body in the relatively large branches of the pulmonary artery almost fills the vessel cavity (Fig. 1), its composition consists mainly of fibrin fibers, and among the fibrin fibers there are clusters of erythrocytes and leukocytes. In this case, it is observed that the vessel wall is stretched and thinned, and in some places the tissue and cell elements of the vessel wall are torn and fragmented. It is observed that the lung tissue located around the vessel is severely swollen and disorganized. Microscopically, a thromboembolus located in an arteriole of a lung tissue is characterized by the granular appearance of fibrin fibers, and hemoglobinogenic pigment granules, leukocytes, and macrophages occupy a place among the fibers. It is determined that the thromboembolus is firmly attached to the endothelium of the vessel wall on both sides, and blood is poured into the vessel wall in these areas. It is observed that the cells of the arteriole wall are somewhat chaotically located, and an infiltrate of lymphoid cells has appeared in the surrounding area. In the surrounding alveolar tissue of the lung, small foci of hemorrhages, foci of hemasiderosis have appeared.

If thromboembolism develops in the branches and arterioles of the pulmonary artery, the necrosis process develops due to ischemia in the areas of the lung tissue that are supplied with blood by these arteries, and because they are located in the alveolar tissue of the lung tissue that is not connected to the bronchi, it is called an infarct. These infarct foci are considered red infarcts because they are almost always saturated with blood coming from the bronchial artery. In this case, microscopically, the alveolar tissue, which has undergone necrosis, enters a state without a complete structure. As the tissue and cell structures of the alveolar space are completely necrotic, their nuclei disappear, the tissue structures disintegrate, become structureless and are completely filled with blood elements (Fig. 2).

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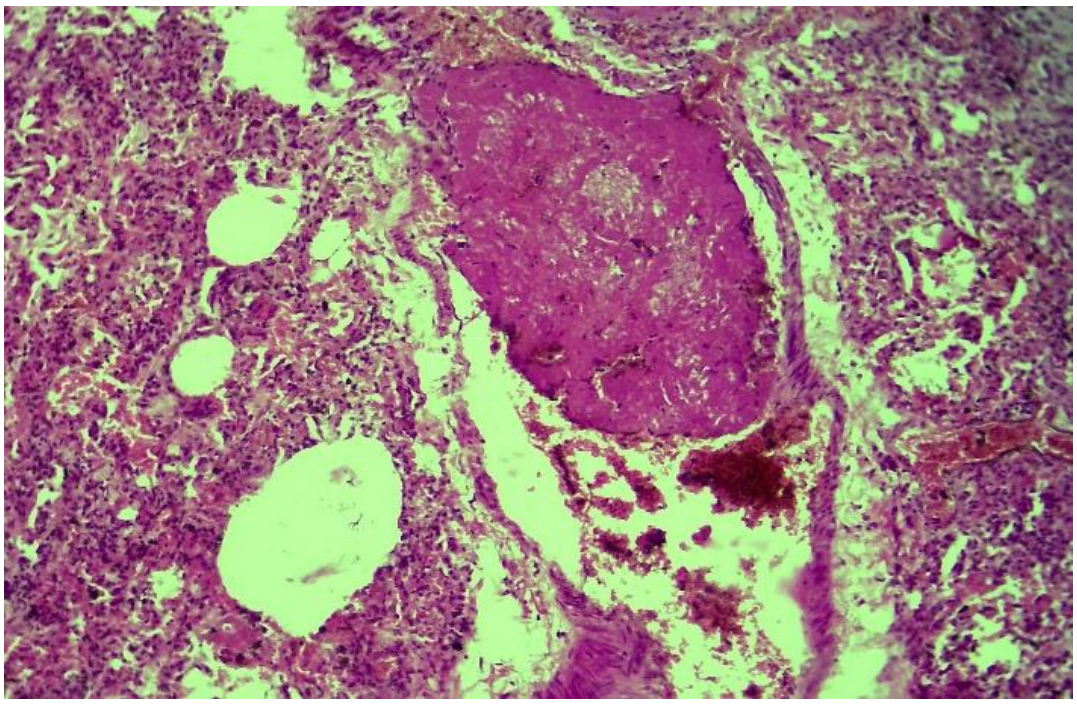

Figure 1. Thromboembolism in the large branch of the pulmonary artery, the composition of which consists mainly of fibrin fibers. Paint: G-E. Floor: 10x40.

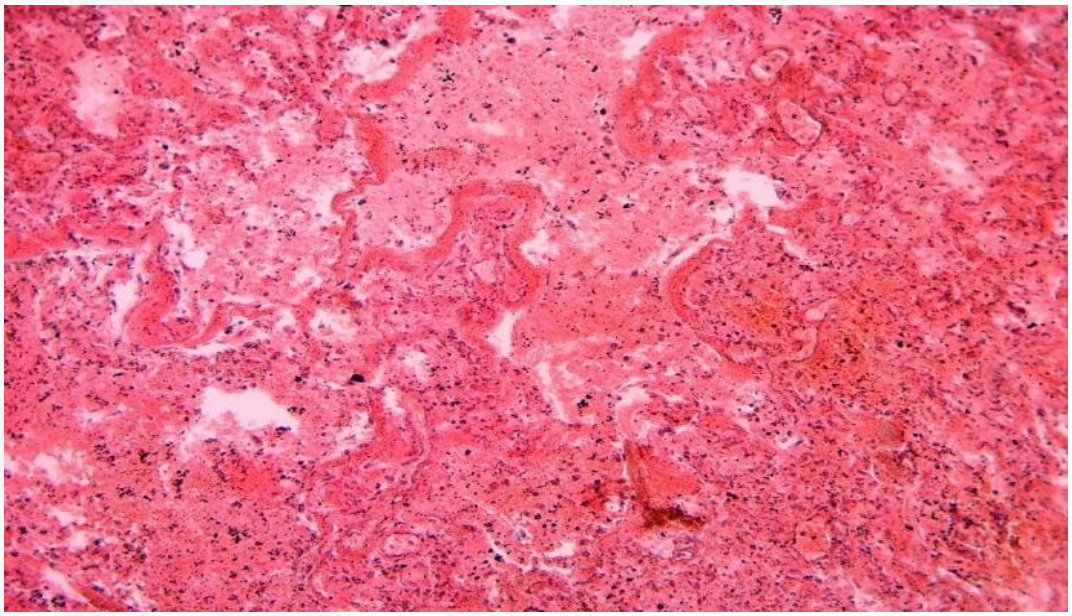

Figure 2. Hemorrhagic infarction in the lung tissue, tissue necrosis of the alveolar space, filling of the cavity with blood elements. Paint: G-E. Floor: 10x40.

Conclusions

Pulmonary artery thromboembolism, regardless of its location, microscopically, it was found to have a histological structure of mainly fibrin fibers, with a small amount of leukocytes, macrophages and hemoglobinogenic pigment granules between the fibers.

If thromboembolism develops in the branches and arterioles of the pulmonary artery, the process of necrosis develops due to ischemia in the areas of the lung tissue supplied with blood by these arteries, and microscopically, the necrotic alveolar tissue becomes completely structureless, completely filled with blood elements.

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