# MORPHOLOGICAL CHANGES IN LUNG TISSUE DURING CHEMOTHERAPY FOR BREAST CANCER

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***Annotation.*** *According to statistics, breast cancer is the leading cause of cancer in women. Chemotherapy is a chemical method, a method of treatment with drugs that have an anti-malignant effect. Drugs used in chemotherapy cause various changes in the lungs. Lung damage in chemotherapy is one of the most urgent problems of oncology in cancer patients. Therefore, this study investigated the morphological changes that occur in lung tissue as a result of chemotherapy for breast cancer.*

***Keywords:*** *lung, morphology, breast cancer, cell proliferation, proliferation index.*

# SUT BEZI SARATONI KIMYOTERAPIYASIDA O'PKA TO'QIMASI MORFOLOGIK O'ZGARISHLARI

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***Annotatsiya.*** *Statistik ma'lumotlarga ko'ra, ko'krak bezi saratoni ayollarning xavfli kasalliklari orasida birinchi o'rinda turadi. Kimyoterapiya kimyoviy usul bo'lib, xavfli o'smalarga qarshi ta'sir etish xususiyatiga ega*

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*dori vositalari bilan davolash usulidir. Kimyoterapiyada qo'llaniladigan dori vositalari o'pkada turli xil o'zgarishlar olib keladi. Kimyoterapiyada o'pka shikastlanishi saraton kasalliklarida onkologiyaning eng dolzarb muammolaridan biridir. Shu sababli ushbu tadqiqotda sut bezi saratoni kimyoterapiyasi natijasida o'pka to'qimasida yuzaga keladigan morfologik o'zgarishlar o'rganildi.*

***Kalit so'zlar:*** *o'pka, morfologiya, sut bezi saratoni, hujayra proliferatsiyasi, proliferatsiya indeksi.*

## МОРФОЛОГИЧЕСКИЕ ИЗМЕНЕНИЯ ЛЕГКИХ ПРИ ХИМИОТЕРАПИИ РАКА МОЛОЧНОЙ ЖЕЛЕЗЫ

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***Аннотация.*** *Согласно статистике, рак молочной железы является ведущей причиной рака у женщин. Химиотерапия — это химический метод, метод лечения препаратами, обладающими противоопухолевым действием. Препараты, используемые в химиотерапии, вызывают различные изменения в легких. Повреждение легких при химиотерапии является одной из наиболее актуальных проблем онкологии у онкологических больных. Поэтому в данном исследовании изучались морфологические изменения, происходящие в легочной ткани в результате химиотерапии рака молочной железы.*

***Ключевые слова****: легкие, морфология, рак молочной железы, пролиферация клеток, индекс пролиферации.*

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Research objective: To determine morphological changes in lung tissue as a result of chemotherapy for breast cancer

Materials and methods: Morphometric studies were conducted in the laboratory of the Bukhara State Medical Institute based on regulatory and methodological documents. Rats were divided into 3 large main groups (n=30): Group 1 - healthy experimental animals in standard vivarium conditions, white non-breed rats in the control group (n=10); Group 2 - the group in which mammary cancer was induced by administering the carcinogen 7,12-dimethylbenzanthracene (n=10); Group 3 - the group in which rats with cancer were intragastrically administered 0.7 ml of distilled water through a gastric metal probe for 21 days, and in the following days, cisplatin was administered intravenously at a dose of 0.4 mg/kg (n=10);

In our experiment, we used the carcinogenic substance 7,12-dimethylbenzanthracene (DMBA), an oncogenic polycyclic aromatic hydrocarbon (S20N16), to induce cancer. It is a colorless crystal with a yellowish tinge, soluble in fats, practically insoluble in water. It is not found in natural conditions.

A single subcutaneous injection of 0.1 mg of dimethylbenzanthracene into the chest area of group 2 white outbred rats stimulated the formation of sarcomas, and application to the skin led to the formation of papillomas and skin cancer in rats. The use of dimethylbenzanthracene caused the appearance of local and distant tumors more often than other substances in this group. During the research process, observations were made on the dynamics of growth and development of rats, their general condition and behavior. It was found that there were no changes in the general condition and behavior of the animals. Then, the experimental animals were weighed at the appropriate time in the morning, decapitated under ether anesthesia on an empty stomach and subjected to experiments. Animal killing was carried out in accordance with international recommendations for medical and biological research using

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laboratory animals. The main objects of the study were 0.5 × 5 cm sections taken from the lungs of white outbred rats, and micropreparations were examined using hematoxylin-eosin and Van Gieson methods.

Results and conclusions

Externally, the lungs of 6-month-old white outbred rats were covered with a serous membrane consisting of a flat mesothelium (height 4.13±0.19 μm) with hyperchromatic oval-elongated and rod-shaped nuclei and a layer of subepithelial connective tissue, penetrated by a dense network of capillaries. The connective tissue layer, in turn, is formed by numerous cellular elements with oval hyperchromic nuclei, as well as fibers in some places, which are directed along the surface of the organ and are characterized by a wavy arrangement. The total thickness of the serous membrane of the lung is 19.2±1.1 μm.

In the form of one field of the microscope (about 20, ob. 40), closer to the periphery of the organ, the number of alveoli is on average 6.73±0.26, closer to the center of the organ - 7.66±0.33. Alveoli are separated from each other by thin alveolar septa, through which capillaries pass.

The inter-alveolar septa consist of densely packed cell elements (with round and oval nuclei, in which the nucleus and chromatin fragments are clearly visible), as well as thin connective tissue fibers. Closer to the periphery of the lung, the thickness of the inter-alveolar septa is 9.75±0.49 μm, closer to the center of the organ - 8.73±0.43 μm.

The bronchi (regardless of their size) are accompanied by blood vessels. The media of the arteries is characterized by the development of smooth muscle elements. In large vessels (in those with valves), the proportion of smooth muscle elements is much lower than in arteries of similar size. In small veins, smooth muscle elements are not detected, therefore it is often difficult to distinguish them from the alveoli. In the walls of the bronchi with a lumen diameter of 800-1000 microns, cartilage plates with a thickness of 54.05±3.06

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microns are found. Within the plates, there are densely located chondrocytes of oval and irregular shape with clearly visible boundaries and a diameter of 15.44±0.8 μm. The nuclei of chondrocytes (diameter 5.38±0.21 μm) are oval or round in shape, contain clearly visible nucleoli and chromatin fragments. The plates are very clearly delimited from the surrounding smooth muscle tissue. In this case, the bundles of smooth muscle cells adjacent to the plates are oriented along their surface. In the experiment, in areas of focal infiltration of lung tissue after chemotherapy for breast cancer, morphological manifestations of a typical hemorrhagic-edema syndrome were observed. Interalveolar septa are unevenly thickened due to prebronchial infiltration. Diapedetic microhemorrhages are rare. Adventitia edema is shown around the arterioles. Some vessels and small bronchi are adjacent to polymorphic cellular infiltrates with a predominance of granulocytes. Areas of complete infiltrative compression alternate with incomplete atelectasis and normal alveoli. Alveolar emphysematous areas are abundant and interalveolar septa are ruptured. In individual bronchi, keratinized epithelium and pale pink threads (phlegm) are noticeable.

Conclusion. After chemotherapy for breast cancer in rats, changes in lung tissue became more pronounced, affecting all structures of the bronchial tree and the respiratory parts of the lungs. The presence of keratinized epithelial cells and macrophages was detected in the bronchial cavities. The volume of infiltrates increased. The average area of peribronchial infiltrates in the lung root region significantly increased compared to the control group of animals: the average area of infiltrates around medium-sized bronchi increased from 326600.0 to 336356.0 μm² in 6-month-old rats. It was found that large-area infiltrates often consisted of multinucleated macrophages, lymphocytes, neutrophils, a few eosinophils and plasma cells. The main cells in the infiltrate were, of course, macrophages and lymphocytes. When stained by the Van

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Gieson method, fibrous structures (fibrosis) were found to grow along the periphery of the infiltrates.

## REFERENCES

1. Shomurodova Mukhayo Rakhmonovna, (May 6, 2023). Morphological Features and Morphometric Parameters of the Lungs after Correction with an Immunomodulator Under the Conditions of Experimental Chemotherapy. Journal of Natural and Medical Education (pp. 55-60).

2. Shomurodova Mukhayo Rakhmonovna, (05, 2023) Mastopatiya. Yosh Patmorfolog Nigohida. Amaliy va tibbiyot fanlari ilmiy jurnali (193-197) https://sciencebox.uz

3. Shomurodova Muxayyo Raxmonovna (05, 2023) Morfometricheskie Pokazateli Legkix Posle Korreksii Immunomodulyatorom V Usloviyax Eksperimentalnoy Ximioterapii Amaliy va tibbiyot fanlari ilmiy jurnali (198-202) https://sciencebox.uz

**4.** Shomurodova M. R. (2023). Morphological Changes in Lungs Caused by Chemotherapy in Breast Cancer. American Journal of Pediatric Medicine and Health Sciences (2993-2149), 1(10), 341–344. Retrieved from http://grnjournal.us/index.php/AJPMHS/article/view/2088

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