

**HISTOLOGICAL APPEARANCE OF TISSUE ARCHITECTURE CHANGES IN
ONCOLOGICAL PROCESSES**

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Annotation: This article discusses the histological aspects of architectural changes in tissues resulting from oncological processes. Pathological changes such as inflammation, cell proliferation, atypia, necrosis, and stromal reactions are analyzed on the basis of histological sections. Particular attention is paid to the structure of benign and malignant tumors, their cellular composition, differential diagnostic capabilities, and specific microscopic features.

The study identified the structural features of tumor tissues using histochemical and immunohistochemical methods. This article serves as an important theoretical basis for pathologists-histologists, oncologists, and medical professionals in clinical diagnostic practice.

Key words: oncological processes, histological appearance, tissue architecture, cellular atypia, tumor tissues, differential diagnosis, histochemistry, immunohistochemistry.

Introduction:

In modern medicine, oncological diseases are a global problem that poses a serious threat to human health, and their early detection and correct diagnosis are one of the main factors determining the effectiveness of treatment. Oncological processes radically change not only the morphological structure of cells, but also the general architecture and functional state of tissues. A deep study of these changes, especially in determining the characteristics of tumors through histological examinations, is of great importance in the differential diagnosis of benign and malignant neoplasms. Histological preparations are used to determine criteria such as tissue architecture, cell differentiation, mitotic activity, necrosis, and invasiveness. This article analyzes the morphological and histological changes that occur in oncological processes and highlights diagnostic possibilities based on them.

The main part Oncological processes disrupt the normal architecture of tissues in the body, altering the ability of cells to grow, divide, and perform their functions. This condition is histologically determined by varying degrees of atypia, anisocytosis, polymorphism, and mitotic activity. In particular, in the development of a malignant tumor, abnormal tissue structure - disorganization, changes in the nuclear-cytoplasmic ratio, coarsening of nuclear chromatin, and increased nuclear division are observed. Benign (good-quality) tumors usually squeeze the surrounding tissues, but do not invade them. Malignant (bad-quality) tumors have the property of invasive growth and metastasize through the blood and lymphatic vessels. These changes are visible in histological sections by the deep penetration of tumor cells into the surrounding tissues, the absence or disruption of the capsule. Histological examinations can reveal different tumor types, such as adenocarcinoma, squamous cell carcinoma, sarcoma. Each tumor type has a unique architecture and cell shape. For example, adenocarcinomas grow while maintaining a glandular structure, but these

glands are irregular and abnormal in shape. Squamous cell carcinoma is characterized by a cluster of cells that are keratinized and form keratin “pearls”. Immunohistochemical methods detect cell markers (e.g. Ki-67, p53, HER2/neu, etc.), which are used to assess tumor activity and the likelihood of metastasis. These methods clearly distinguish between tumors with the same histological appearance but different clinical manifestations. Stromal changes, i.e. the reactive response of the connective tissue and blood vessels surrounding the tumor, are also diagnostically important. In many cases, angiogenesis (formation of new blood vessels), foci of necrosis, lymphocytic infiltration and fibroblastic proliferation are observed. These signs help to assess the stage of the oncological process and the behavior of the tumor. In general, histological analysis not only confirms the presence of a tumor, but also allows to determine its degree of spread, degree of differentiation and prognosis. Therefore, histological manifestations are one of the most reliable and basic tools in oncological diagnosis.

Conclusion:

Oncological processes cause profound and complex changes in tissue architecture. These changes are histologically manifested by cellular atypia, degree of differentiation, invasiveness, and stromal reactions. Malignant tumors are characterized by irregular cell proliferation, lack of a capsule, the ability to metastasize, and high mitotic activity. Histological analysis and modern immunohistochemical methods make it possible to determine the type, stage, and prognosis of the tumor, which plays an important role in choosing a diagnostic and treatment strategy. Therefore, the correct assessment of histological manifestations is one of the main scientific and practical directions in the fight against oncological diseases.

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