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CHEMICAL STRUCTURE OF BREAST CANCER CONCREMENTS

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The process of pathological biomineralization plays an important role in tumor growth morphogenesis. The role of heavy metal salts in pathological mineralization of breast cancer tissue should not be ruled out taking into consideration their ability to enter in covalent bonds with calcium salt molecules.

Objectives. To study microelement composition of breast cancer calcifications and find out heavy metals participation in their formation process.

Material and Methods. Materials for research were 20 specimen of breast cancer tissue where calcifications were found out by histological study (hematoxylin-eozin and alizarin red S staining). Chemical composition was studied by scanning electron microscope with energy-dispersion spectrometer.

Results. Alizarin red S staining detected the presence of concernments in tumor tissue and a ring of calcification around these deposits. Microelement composition of bio mineralizes, studied with energy dispersive spectrometry, showed that along with calcium and phosphorus its structure contains such microelements as iron, zinc, copper, chromium and nickel. They can substitute calcium ions in exterior part of the hydroxyapatite molecule. It will cause hydroxyapatite molecule’s molar weight increase, its solubility decreases and increases the chances to deposit in tumor tissue. This implies an increased intake of heavy metal's salts in organisms and can lead to pathological mineralization of breast cancer tissue.

Conclusions. Excessive amount of heavy metal salts ingression in women’s body causes their involvement into progression of pathological breast cancer mineralization. It happens due to their bonding to hydroxyapatite molecules, direct sedimentation of proteins and increasing degenerative-necrotic changes in breast cancer tissue with their further petrifaction.