

Elemental composition of the bone structures of the head and neck of the femur with dysplastic coxarthrosis studied by X-ray analysis with ion excitation

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The characteristic X-ray spectra of the bony tissue section, taken from patients during a surgery with hip arthroplasty, were measured. As study samples the slices of degraded bone tissue of the upper pole of the femoral head and relatively healthy areas of lateral departments of the femoral neck were used. The results of elements analysis of degraded bone tissue of the femoral head in deforming arthrosis of the hip joint of the 3rd degree are presented and discussed

A spectrometer of characteristic X-ray excited by ion bombardment was designed and created on the basis of ion electrostatic accelerator AN-2500. The energy resolution of spectrometer, which measured at 5.9 keV line of the ⁵⁵Fe spectrometric source, amounts to 151 eV.

It is show that the intensity of P and Ca spectral line in the sick tissue is reduced by 20% and 30%, respectively. Meanwhile, the amount of chlorine increases by almost five times. It is indicating on the accumulation of salts in the sick tissue and the impoverishment of the bony tissue with calcium and phosphorus.