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Introduction. In the study, we attempted to assess features of bone growth after implantation of hydroxyapatite material OK-015 into the tibia.

Materials and methods. 126 rats with initial mass of 130-135 grams were divided into 3 groups: 1st group – intact animals, 2nd group – rats with 2.2 mm defect formed on the border between proximal metaphysis and diaphysis of the tibia. In the 3rd group, the bone defect was filled with 2.2 mm hydroxyapatite implants that contained vitreous phase up to 6,6%.
The observations terms were 7, 15, 30, 60, 90 and 180 days. The humeri, hipbones and the 3rd lumbar vertebrae were excised

for osteometry, and Simon index calculation.

Results and discussion. The intact animals exhibited intensive longitudinal and appositional bone growth. The 2nd group exhibited retarded bone growth evident in decrease of humerus length by 2.44%-5.43% in the period from the 30th till the 90th days compared to the controls. Length of the vertebral body by the 30th day of observation was less than that of the controls by 3.05%. Here we may assume that the experimental conditions influenced primarily epiphyseal cartilages because only the humerus features two epiphyseal cartilages unlike the rest of the studied bones. In the period from the 7th day to the 90th day antero-posterior diameter of the humerus was less than in the control group by 5.42%-8.83%. Vertebral body width in the same period decreased by 2.76%-5.49% and transverse diameter of the diaphysis of humerus decreased by 4.11%-7.10%. By the 180th day of observation, all values returned to baseline. Bone loss was confirmed by dynamics changes of obturator foramen size: its longitudinal size increased by 2.03%-5.61% compared to the controls. In the 3rd group growth rate also decreased yet to smaller extent than in the 2nd group and was observed mostly in humerus. The length of the humerus was less than in 1st group, by the 7, 30, 60 and 90 days by 2.69%-4.20%. Hipbone length and vertebral body length were not different to those of controls. Antero-posterior diameter of the humerus, was less than in group 1st on the 3,31%-7,22% respectively, in time from 15 day to 60 days. The transverse size of the vertebral body was not different to that of the control group. Simon index under such conditions increased similarly to the 2nd group.

Conclusions. The defect in tibia results in decrease of bone growth rate. Bone growth rate depended on regeneration activity degree in bone defect zone. Implantation of hydroxyapatite also resulted in retarded bones growth though less expressed than in the 2nd group. Probably, we can influence regeneration processes in the defect zone by implanting hydroxyapatite and systemic skeletal reactions by changing composition of implants.