

THE RESULTS OF DEMINERALIZATION OF BONE GRAFTS

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Actuality. Nowadays, after the blood, the bone is the most frequently transplanted tissue. Demineralized allograft have a better effect of osteointegration and are replaced faster by native bone tissue. At the same time being a cell-free bone tissue which can be used to obtain tissue engineered structures for regenerative medicine. There is enormous necessary in biotransplants for orthopedy, dentistry, skeletal oncology, neurosurgery etc.

The aim of the study was to develop a fast method of demineralization of cancellous and cortical bone grafts, in various sizes, for use in restoring bone defects and implement this method in practice of Human Tissue Bank.

Materials and methods. for the study were used cortical bovine bones (tibia and femur). The bones were cut with saws, excluding their heating, bones were deperiostated, washed under running water, dried and degreased. We obtained different shapes of the bones by cutting: circular shape, semilunar shape (used for control), plate and cubic shaped bones. Grafts were distributed into groups according to the methods of demineralization, dimensions and type of bone. We got nine transplants - bone rings with Ø 4 cm and thickness 5 mm ± 0, 2 mm, 3 specimens for demineralization in acid and 3 by electrolysis. Other three grafts were used as control. Each graft weighed 0.75g ± 0.05g. Two plate-shaped (70x20 mm) and two cubic-shaped (2 cm²) grafts were demineralized by electrolysis in acid and by electrolysis. The acid solution was changed over every 24 hours. The demineralization was determined by X-ray and by mechanical method.

Results: complete demineralization of the circular-shaped grafts through the electrolytic solution was obtained on the 4th day, and in the samples demineralized just only by acid solution the complete demineralization was obtained on the 7th day. The superficial demineralization of the plate-shaped cortical graft was obtained on the 3rd day, but final demineralization on the 7th day. Partial demineralization of cancellous cubic-shaped graft was obtained on the 2nd day, but total demineralization was obtained on the 5th day.

Conclusions: the obtained results showed that electrolysis could be a method for accelerating the bone tissue demineralization for both cortical and cancellous bone. The speed of demineralization depends on the dimensions of the grafts, and type of bones. Cancellous bone demineralize faster than cortical one.