S4-1.4

The Cartilaginous Tissue Regeneration on Weight Bearing and Non-weight Bearing Surfaces of the Knee

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Regeneration of articular cartilage is a major problem in the field of orthopedic surgery and regenerative medicine. Most research on cartilage regeneration performed on rabbits, tests the possibilities of cartilage regeneration on the non-weight bearing surfaces of the distal femur - in the trochlear groove of the femur, giving less importance to the weight bearing surfaces, the areas where the joint surface is subjected to various high forces. The study was performed on 4 month old domestic rabbits in which type I collagen sponges combined with bone marrow mesenchymal stem cells (MSC) were transplanted. For comparison, the combined grafts were transplanted at 2 levels - in a defect on the weight bearing articular surface of the medial femoral condyle (n = 3) and in 2 defects made in the trochlear groove of the femur (n = 3). As a negative control served the experimental defects (n=2) made in the the trochlear groove of the rabbits femurs (n=6). The results were evaluated using the Unified Histological Score of Regenerated Cartilage (UHSRC) after removing the animals from the experiment at 12 weeks, and the last 3 from the control group at 52 weeks. As a result, at 12 weeks no difference was determined between the control group and the combined grafts transplanted into the defects from trochlear groove ($p>0.8$), but, a significant difference was found between results obtained after transplantation of combined grafts in the weight-bearing and non-weight-bearing areas ($p = 0.002$). The control group removed from the experiment from the experiment at 52 weeks has better results comparing to those removed at 12 weeks ($p<0.1$).