THE TREATMENT OF ACUTE AND CHRONIC OSTEOCHONDRAL DEFECTS WITH AUTOLOGOUS OSTEOPERIOSTEAL GRAFTING. (AN EXPERIMENTAL STUDY IN RABBITS.)

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Introduction:
The treatment of articular cartilage injuries, particularly in young adults continues to be a big challenge despite numerous experimental and clinical studies. The healing pattern of untreated osteochondral defects and the effect of osteoperiosteal grafting as a treatment modality in white rabbits were investigated by macroscopic, histological and biochemical parameters.

Material and Methods:
This study was approved by the Ethics Committee of Ege University, Turkey. A 3.5x4mm tubular osteochondral defect was created on the right medial femoral condyle of 51 adult white rabbits. There were 3 groups. In control group (CG) (18 rabbits) the defects were left alone. In early grafting group (EGG), (15 rabbits) defects were treated by an osteoperiosteal graft harvested from anteromedial tibia, 7 to 15 days after index procedure. Osteoperiosteal graft was harvested in block without separating the periosteum from underlying bone. In late grafting group (LGG) (18 rabbits) defects were grafted at 12th weeks. The rabbits were followed-up to 24 weeks and sacrificed in regular intervals. Histological results were evaluated with a 21 points scale. Synovial fluid samples were also collected regularly and biochemical Evaluation: In CG, synovial fluid PF and TC levels were significantly higher than the preoperative levels and reached their maximum at 24 weeks. In LGG, a less prominent decrease was observed after grafting and returned to preoperative levels at 24 weeks. In EGG, a less prominent decrease was observed after grafting. Contralateral (control) knee synovial fluid levels were parallel to the operated ones.

Comparison of Histological and Biochemical result: In CG; there was a negative correlation between total histological scores and proteoglycan or collagen levels. That means even if histological improvement has progressed; the increased catabolic activity in the knee joint could not be stopped. In EGG; PF and TC levels decreased significantly after grafting and returned to preoperative levels at 24 weeks. In LGG, a less prominent decrease was observed after grafting. Contralateral (control) knee synovial fluid levels were parallel to the operated ones.

Conclusions:
Osteoperiosteal grafting is a method of value for treating of focal cartilage defects. This easy and inexpensive method does not require any sophisticated technique and instrumentation and can be carried out in the same surgical area. The results of the same treatment protocol in acute and chronic defects are different. This should be considered in research designs. Synovial fluid studies can give valuable information about the determination of the patients-at-risk for early osteoarthritis, disease activity and the treatment results.

References:
7. Taşkran, D; Taşkran, E; Özsoy, H; Lök, V: Effects of surgical trauma on articular cartilage. Turkish J Medical Sciences, 29; 177-180: 1999

Figure 1: Synovial fluid proteoglycan fragment levels.