

7. Summary

Histological, immunohistological and histomorphometrical studies on the regeneration of osteochondral defects in a sheep model.

Comparison between osteochondral transfer, crushed spongiosa and empty defects.

Subject of this study was to compare the clinically established method of osteochondral autografts with the treatment of crushed spongiosa as cartilage defectfilling. The aim of the study was to assess the cartilage healing in the group of the osteochondral transfer, the crushed spongiosa and a non-treated defect in a histological and mainly an immunohistochemical way. In particular it was the intention to assess the dependence of cartilage healing on the regeneration of the subchondral bone as a mechanical support.

A total of 24 two year old merino-mix sheep were used. Osteochondral defects were created in both condyles in the left knee. The defect was filled either at the lateral or the medial side with the osteochondral transfer or the crushed spongiosa. The harvesting defect remained empty and served as a control with natural healing. Two postoperative observation periods of three and six months were chosen. Histological evaluation of the cartilage bone regeneration products was carried out after staining with Safranin O as well as immunhistologic staining of collagen type I and collagen type II.

The results of the study showed, that the applied crushed spongiosa was not able to withstand the results of the osteochondral transfer group and improve the cartilage regeneration. The implant was not able to provide the expected mechanical support until completion of bone regeneration. Histologically, there was a significant debased bony support of the defect as well as a lack of cartilage. The operationmethod of crushed spongiosa could not improve the cartilage regeneration.

A positive influence of good bony support on the quality of the regenerated cartilage was demonstrated in the OCT-group after three month. A good bony ingrowth correlated with high ratings in the score system.

The conclusion is that despite of beginning degenerative evidence, the osteochondral transfer was superior to the other operationmethods.