# R-13. THE EFFECT OF CALCIUM PHOSPHATE-CHITOSAN BLOCK BONE GRAFT ON THE PERIODONTAL REGENERATION IN THE ONE WALL INTRABONY DEFECT IN THE BEAGLE DOGS

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## Backgrounds

The regeneration of bone has long been the critical issue in periodontal and implant surgery. Many procedures have been developed for the purporse of promoting regeneration., including guided tissue regeneration and bone graft, but all of them have limitations. Recently, a tissue engineering strategy has been suggested as a possible alternative to conventional regenerative therapy. Chemical mediators or substances that enhance bone formation are thought to be conductive to periodontal regeneration. Among these materials, the influence of chitosan on bone regeneration is a particular interest. Chitosan takes an increasing interest for its non-toxic, immune enhancing, antimicrobial, and wound healing properties. However, chitosan has a low physical property leading to an improper use in the areas where it receives a lot of force. The aim of this study was to evaluate the regenerative effects of a chitosan membrane and/or calcium phosphate-chitosan block bone applied to preclinical one wall defects surgically created in beagle dogs.

## Materials and Methods

Six male beagle dogs were used. 4X4 mm one-wall intrabony periodontal defects were surgically created bilaterally at the distal sides of the mandibular second premolars and mesial sides of the fourth premolars. Only the surgical control group received a flap operation only. The first group was treated with chitosan membrane. The second group was treated with calcium phosphate-chitosan block bone. The third group was treated with calcium phosphate-chitosan block bone and chitosan membrane. Calcium phosphate-chitosan block bone was produced by frozen-drying methods. The dogs were sacrificed 8 weeks after the experimental surgery, and a comparative histological examination was done.

Results and Conclusion

Surgical procedures were uneventful and without any complication. In the control group, the apical migration of junctional epithelium was observed. The periodontal ligament fibers were generally oriented in a direction parallel to the root surface. No ankylosis was noted. In chitosan membrane group, the orientation of fibers was similar to that of the control group. Residual chitosan membrane remnants were observed at connective tissue area.The amount of newly formed bone and cementum was greater than that of the control group. In the calcium phosphate-chitosan block bone group, all the block bone was resorbed and dense connective tissue was shown. The fiber orientation was similar to that of the chitosan membrane group. The amount of new alveolar bone and cementum formation was greater than the control group, but there was no significant difference between the group with membrane alone and the block bone group. Chitosan membrane and block bone group revelaed similar results to that of the membrane or block bone alone. The results of the present study appear to support the potential of chitosan to enhance bone formation, but still show low load bearing capacity. Therefore, the additional study to enhance the mechanical properties appear to be necessary.