R-11. Enhancement of bone regeneration with synthetic oligopeptide coated bovine bone mineral in beagle dogs

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Background

A synthetic peptide sequence of corresponding to the cell binding was demonstrated to be involved in binding of cells particularly fibroblasts and osteoblasts. Incorporation of these peptides into the microstructure of anorganic bone grafting material can be expected to facilitate and expedite the ingrowth of bone by promoting the immigration of reparative cells from the surrounding tissues. The osteopromotive effect of peptide-coated bone in a rabbit calvarial defect model showed accelerated new bone formation was observed within the peptide-coated group at both two and four weeks, as compared with uncoated group.

Object

The purpose of this study is to evaluate the guided bone regeneration effect of peptide-coated bone in a beagle-3-wall defect model.

Method

Two adult beagle dogs, weighting approximately 15 kg each, were used in this study. The madibular premolars were extracted and the extraction sites were allowed to heal for 2 months in one beagle dog. After two months, 3-wall defect was prepared at the central part of the extraction sites with a round bur and low speed engine. The peptide-coated bovine bone were implanted on one side and the peptide-uncoated bone mineral on the other side. The membrane was tucked underneath the mobilized lingual flap. The same procedure was done simultaneously with

extraction. The average percentage of new bone formation for the test and the control sites was determined at 4 weeks.

Results

No specimen revealed any evidence of infection or foreign body reaction, and all wounds showed a good healing response. Sites augmented with peptide-coated bone mineral and peptide-uncoated mineral exhibited excellent maintenance of ridge contour.

The quantity of new bone of peptide-coated sites was greater than that of peptide-uncoated sites in simultaneous and staged groups. The new bone was evenly deposited around the graft material in peptide-coated sites of simultaneous and staged approach, and the bone mineral was fully integrated with the new bone.

There were significant differences in the regenerated areas between peptide-coated and peptide-uncoated sites in both groups.

Conclusion

The use of deproteinized cancellous bovine bone combined with a synthetic appears to be a more beneficial material for guided bone regeneration in beagle-3-wall defect model.