

R-14. THE EFFECTS OF TETRACYCLINE BLENDED CHITOSAN MEMBRANES ON PERIODONTAL HEALING OF ONE-WALL INTRABONY DEFECTS IN BEAGLE DOG

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Backgrounds

Guided tissue regeneration (GTR) is regarded as the effective method in the treatment of periodontal defects. Successful results following GTR have been reported with nonresorbable and bioabsorbable membranes. Chitosan (poly-N-acetylglucosaminoglycan), the derivative of chitin is a bioabsorbable nontoxic biopolymer. Due to its physical availability, chitosan can be fabricated into fibers, solutions, gels, sponges, and membranes for regenerative therapy. Tetracyclines (TC) have been used extensively in periodontal treatment. In addition to its antibacterial effect, TC agents have been known to have the ability to inhibit neutrophils, osteoclasts, and matrix metalloprotenases that appear to be involved in the destruction of the periodontium. TC can also inhibit extracellular conversion of latent pro-MMP into activated MMP. The aim of this study was to evaluate the regenerative effects of tetracycline-containing chitosan membranes applied to surgically created one-wall intrabony defects in beagle dogs.

Materials and Methods

Four male beagle dogs, 18-24-month-old and weighting about 15kg were used. 4*4 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. The surgical control group received a flap operation only. The chitosan group was treated with chitosan membrane. The chitosan/0.5%TC group was treated with chitosan/0.5%TC membrane. The chitosan/1.0%TC group was treated with chitosan/1.0%TC membrane. The dogs were sacrificed 8 weeks after the experimental surgery, and a comparative histological examination was done. The data was used to test for differences among the experimental group using the

Kruskal–Wallis test. The Mann–Whitney U test was used for the comparison between the groups.

Result and conclusion

The apical migration of junctional epithelium was observed and in almost case The amount of junctional epithelium migration and connective tissue adhesion did not show any statistical significant differences among the groups. The amount of cementum regeneration was 1.53 ± 0.52 , 1.75 ± 0.27 , 1.99 ± 0.41 , and 2.09 ± 0.25 mm for the surgical control group, the chitosan group, the chitosan/0.5%TC group, and the chitosan/1.0%TC group, respectively, with a significant difference between the surgical control group and the chitosan/1.0%TC group ($p < 0.05$). The amount of new alveolar bone formation was 1.19 ± 0.68 , 1.53 ± 0.17 , 1.77 ± 0.45 , and 1.82 ± 0.23 mm for the surgical control group, the chitosan group, the chitosan/0.5%TC group, and the chitosan/1.0%TC group, respectively, with a significant difference exhibited between the surgical control group and the chitosan/1.0%TC group ($p < 0.05$). The results suggest that chitosan/1.0%TC membrane may have a beneficial effect on the regeneration of alveolar bone and cementum in intrabony periodontal defects. The results suggest that chitosan/1.0%TC membrane may have a beneficial effect on the regeneration of alveolar bone and cementum in intrabony periodontal defects.