A-6. Transforming Growth Factor-1 Accelerates Resorption of a Calcium Carbonate Biomaterial in Periodontal Defects

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BACKGROUND

In a previous study, recombinant human TGF-1 (rhTGF-1) in a calcium carbonate carrier was implanted into critical-size, supraalveolar periodontal defects under conditions for guided tissue regeneration (GTR) to study whether rhTGF-1would enhance or accelerate periodontal regeneration. The results showed minimal benefits of rhTGF-1 and a clear account for this could not be offered. One potential cause may be that the rhTGF-1 formulation was biologically inactive. Several growth or differentiation factors have been suggested to accelerate degradation of biomaterials used as carriers. The objective of this study was to evaluate possible activity of rhTGF-1on biodegradation of the calcium carbonate carrier.

METHODS

rhTGF-1 in a putty-formulated particulate calcium carbonate carrier was implanted into critical-size, supraalveolar periodontal defects under conditions for GTR in five Beagle dogs.Contralateral defects received the calcium carbonate carrier combined with GTR without rhTGF-1 (control).The animals were euthanized at week 4 week postsurgery when block-biopsies of the defect sites were collected for histologic and histometric analysis. Radiographs were obtained at defect creation, week 2 and week 4.

RESULTS

No statistically significant differences were observed in new bone formation (bone

height and area) among the treatments. However, total residual carrier was significantly reduced in sites receiving rhTGF-1 compared to control ($p=0.04$). Similarly, carrier density was considerably reduced in sites receiving rhTGF-1 compared to control, the difference being borderline statistically significant ($p=0.06$).

CONCLUSIONS

Within the limitations of the study, it may be concluded that rhTGF-1 accelerates biodegradation of a particulate calcium carbonate biomaterial indicating a biologic activity of the rhTGF-1 formulation apparently not encompassing enhanced or accelerated periodontal regeneration.