Regenerative capacity of Local Intraoral Adipose Stem Cell with Demineralized Bone Matrix versus Autologous Bone Harvesting in Canine Alveolar Bone Defects

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Abstract

Background: The limitations and morbidity associated with autogenous bone grafting have driven the search for predictable bone substitutes and bioimplants. Stem cells offer an interesting tool for tissue engineering, thus the purpose of this study was to observe and compare the regenerative capacity of artificial alveolar bone defect after autogenous bone grafting versus seeding of Adipose Tissue-Derived Stem cells (ADSCs) either alone or in combination with demineralized bone matrix (DBM).

Methodology: Standardized bilateral buccal dehiscence defects (4 × 3 × 3 mm) were surgically created in 24 healthy dogs and divided into 6 groups, Control group, Autogenous bone graft group, ADSCs group, ADSCs together with autogenous bone grafting, DBM group and finally ADSCs and DBM group. All animals were subjected to histological and histomorphometric analysis.

Results: Histologic and histomorphometric analysis within the same group revealed that the coronal mean values were higher in control, ADSCs with DBM and DBM groups and the apical values were higher in the three other groups.

Conclusion: This study demonstrated that the adipose derived stem cells with DBM have potential as a suitable alternative to autogenous bone in the treatment of alveolar bone defect.

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