R-19. The Effect of Recombinant Human Bone Morphogenetic Protein-4 with Fibrin-Fibronectin Sealing System(Tisseel®) on Bone Formation in Rat Calvarial Defect

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연구 배경

Reconstruction of supporting structure is the major goal of periodontal therapy. Various procedures and materials have been used to reconstruct and regenerate of periodontal supporting structure. The BMPs have a wide range of effects in numerous tissues, both during development and in the adult. Therefore BMPs are expected to promote healing on periodontal bone defect. But, the ideal delivery system has not yet been found. Human plasma is consist of two major components,which are fibrinogen and thrombin. Fibrin-fibronenctin sealant systems(FFSS) of high concentration of fibrinogen are currently used in oral and maxillofacial sugery. The beneficial aspects of fibrin-fibronectin sealant systems for soft tissues are well documented, yet their contribution to bone surgery and to oral and periodontal surgery remains controversial. The objective of this study was to evaluate the osteogenic effect of rhBMP-4 delivered with fibirn-fibronectin sealant system(Tisseel®) in the rat calvarial defect model.

연구방법 및 재료

Calvarial, 8-mm , critical-size osteotomy defects were created in 30 male Sprague-Dawley rats. Three groups of 10 animals each received either rhBMP-4(0.025mg/ml) in a FFSS(Tisseel®) carrier, FFSS carrier control, negative surgery control and were evaluated by histologic and histometric parameters following a 2 and 8 weeks healing interval (10 animals/group/healing interval).

연구결과

All defects of surgical control group were a minimal amount of new bone formation originating from the defect margins. The defect center was collapsed. Total augmented area of FFSS control group was marked formed, but new bone area was not. Surgical implantation of rhBMP-4/FFSS resulted in enhanced augmented area and new bone formation at both 2 and 8 weeks.

결론

Result of this controlled animal study indicated that FFSS served as scaffold that maintained room for new bone formation and released rhBMP-4 in the proper way. Therefore, FFSS was a suitable delivery system for rhBMP-4.

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