

PR-II-18. The effect of maintenance period of non-resorbable membrane on bone regeneration in rabbit calvarial defects

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Background

To compare the effect of maintenance period of PTFE membrane on bone regeneration in rabbit calvarial defects.

Materials and Methods

Eight rabbits were used in this study. Three defects were surgically made in their calvaria. Using a trephine bur(outer diameter: 8mm, 3i, USA), 3 'through and through' defects were created and 3 groups were classified as control group(no graft), experimental group 1(milled autogenous bone) and experimental group 2(deproteinized bovine bone; OCS-B[®]; NIBEC, Korea). The defects were covered with PTFE membrane(Cytoplast[®]; ACE, USA). Membranes were removed after 1, 2, 4 and 8 weeks post-GBR procedure in 2 rabbits respectively. All rabbits were sacrificed after 8 week post-GBR procedure. Specimens were harvested and observed histologically.

Results

Control group After 1 week, any new bone formation was not evident. After 2 weeks, minimum of bridge-shaped new bone was formed. After 4 weeks, the defect was filled with new bone, though the thickness of regenerated bone less than that of adjacent bone. After 8 weeks, the new bone formation appeared incompletely in the bony cavity, with connective tissue invaded on the superficial surface.

Experimental group 1 After 1 and 2 weeks, the defects were filled with new bone as much as the adjacent bone in thickness with connective tissue invaded on superficial surface. After 4 and 8 weeks, the new bone formation appeared completely in the bone cavity without connective tissue invaded.

Experimental group 2 After 1,2 and 4 weeks, the defects were filled with new bone as thick as the adjacent bone. It showed the invasion of connective tissue. After 8 weeks, the new bone formation appeared completely in the bone cavity

without connective tissue.

Conclusion

- 1) When PTFE membranes are removed early, the most favorable bone re-generation is revealed in experimental group 1, followed by experimental group 2 and control group.
- 2) On GBR, it is recommended that membrane should be maintained for at least 4 weeks with autogenous graft. As well, the use of xenograft needs longer maintenance period than autogenous bone.