B-8 Guided bone regeneration of calvarial defects using bioabsorbable membrane and demineralized freeze-dried bone : An experimental study in rats

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The purpose of this investigation was to evaluate new bone formation in rat calvarial defects using bioabsorbable membrane alone or demineralized freeze-dried bone(DFDB) alone or in combination with a membrane and DFDB. In 48 rats, divided equally into 4 groups, 1 control and 3 experimental, standardized transosseous circular calvarial defects(critical size defects: 8mm in diameter) were made midparietally. In the control group, the defect was only covered by the soft tissue flap. Experimental group 1 was coverd with bioabsorbable membrane, group 2 was filled DFDB, group 3 was filled DFDB and covered with bioabsorbable membrane. Histologic analysis after healing period of 1, 2, 4, 8 weeks.

Compared to the control and group 1, group 2, 3 showed significantly more bone regeneration at all times as attested by histology and measured by histomorphometric analysis ($P<0.001$ ANOVA). At 8 weeks, Bone gain was 4.35 ± 2.27 for control group, 8.75 ± 3.89 for group 1, 33.99 ± 6.30 for group 2, 49.53 ± 23.70 for group 3(1 unit=$0.063mm^2$). Group 3 showed statistically significant greater bone formation than the other group ($P<0.001$). Although the bone gain increase with time, the control and experimental 1 group showed minimal bone formation.

The result suggest a beneficial effect with the use of bioabsorbable membrane in combination with DFDB for the treatment of bone defect.