Bone regeneration capacity of different macroporous biphasic calcium materials in rabbit calvarial defect

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Key words: hydroxyapatite; beta tricalcium phosphate; calvarial defect

[Aims] Synthetic bone products such as biphasic calcium phosphate (BCP) are mixtures of hydroxyapatite (HA) and beta-tricalcium phosphate (β-TCP). However, the optimal ratio of HA/β-TCP is still not determined. The purpose of this study was to evaluate bone regeneration capacity of two commercially available BCP products with different HA/β-TCP ratios.

[Materials and Methods] Calvarial defects were prepared in 16 New Zealand White male rabbits. Osteon® (HA/β-TCP ratio = 70:30) and Bonemedik-DM® (Si-HA/β-TCP ratio = 60:40) particles were filled in each defect and animals were sacrificed at 4 and 8 week postoperatively.

[Results and Conclusion] Augmented area in Osteon® 8 weeks group and Bonemedik-DM® 4 and 8 weeks groups showed statistically significant increase (p<0.001) compared to control group. Newly formed bone area was similar among all the groups. Residual materials were slightly more evident in Osteon® 8 weeks group. Based on histological results, Osteon® and Bonemedik-DM® appears to demonstrate acceptable space maintaining capacity and bone regeneration when compared to natural bone healing in 4 and 8 week periods.