PR-I-8. Ectopic bone formation associated with rhBMP-2 using biphasic calcium phosphate block as a carrier in a rat subcutaneous assay model

Joon-il Kim*, Gyung-Joon Chae, Chang-Sung Kim, Seong-Ho Choi, Kyoo-Sung Cho

Graduate School Yonsei University Department of Dental Science Department of Periodontology, Research Institute for Periodontal Regeneration, College of Dentistry, Yonsei University

Background

The carrier for the delivery of BMPs should serve as a scaffold for new bone. In addition, predictable bone formation in terms of volume and shape should be guaranteed. The purpose of this study is to evaluate the ectopic bone formation of recombinant human bone morphogenetic protein-2(rhBMP-2) using micro macro-porous biphasic calcium phosphate (MBCP: mixture of β-TCP and HA) block as a carrier in a rat subcutaneous assay model.

Materials and methods

Subcutaneous pockets were created on the back in 40 male Sprague-Dawley rats. In the pockets rhBMP-2/MBCP and MBCP alone were implanted. Blockswere evaluated by histological and histometric parameters following a 2 weeks(each 10 rats; MBCP and rhBMP-2/MBCP) or 8 weeks (each 10 rats; MBCP and rhBMP-2/MBCP) healing interval.

Results

Shape and volume of the block were maintained stable over the healing time. Histologic bone forming activity could not found in the MBCP alone sites at 2 weeks. At 8 weeks show minimal new bone formation. New bone formation in the macropores of the block was evident in the rhBMP-2/MBCP sites. The new bone area of the 8 weeks was greater than the 2 weeks . The quantity of the new bone with a more advanced stage of remodeling had increased further.

Conclusion

These results implicated that MBCP block could serve as a carrier system for predictiable bone tissue engineering using rhBMPs.