C-3. Ectopic bone formation associated with recombinant human bone morphogenetic proteins -2 using absorbable collagen sponge and beta tricalcium phosphate as carriers.

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Background

The ectopic bone formation of recombinant human bone morphogenetic protein-2(rhBMP-2) was evaluated using absorbable collagen sponges (ACS) and beta tricalcium phosphate (β-TCP) as carriers in a rat subcutaneous assay model.

Materials and Methods

Subcutaneous pockets were created on the back of rats. The pockets were implanted with rhBMP-2/ACS, rhBMP-2/-TCP, ACS alone, and -TCP alone. The rats were sacrificed at 2 or 8 weeks for histological and immunohistochemical evaluation.

Results and Conclusion

At 2 weeks, bone formation was evident in both the rhBMP-2/ACS and rhBMP-2/ β--TCP sites. At 8 weeks, the quantity of the new bone with a more advanced stage of remodeling had increased further in the rhBMP-2/ β-TCP sites. However, the newly formed bone observed at 2 weeks was not found in the rhBMP-2/ACS sites. On immunohistochemical observation, osteopontin staining was observed on both the rhBMP-2/ACS (2 weeks) and rhBMP-2/ β--TCP (2 and 8 weeks) sites. Osteocalcin was not detected in any of the samples. The lack of space-providing capacity of ACS may be one of the major factors responsible for its failure to maintain the newly-induced bone. Therefore, a carrier for BMPs should provide space for bone formation and maturation during the more advanced healing stages.

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