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Short communication: collagenated cortico-cancellous porcine bone grafts. A study in rabbit maxillary defects

EXPERIMENTAL STUDIES

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U Nannmark[1]
I Azarmehr[1]

1 | Institute of Biomedicine, Sahlgrenska Academy, Gothenburg University, Gothenburg, Sweden

ABSTRACT

In a previous study, the Authors evaluated the bone tissue responses to collagenated porcine bone (CPB), with and without prehydration, finding that CPB exhibits good biocompatibility, osteoconductive properties, and that the material was resorbed by surface osteoclasts as well as part of the remodeling with the formation of osteons. Moreover, they found that the dehydration process made the graft material sticky, facilitating clinical handling. As the influence of different ratios between bone particles and collagen on bone response is not known yet, the aim of this short communication was to evaluate the bone tissue response to CPB, with different collagen gel content, when placed in defects in the rabbit maxilla. In this study, bilateral bone defects, 5x8x3 mm, were created in the maxilla of 8 rabbits. The defects were filled with prehydrated (20% collagen I/III) collagenated cortico-cancellous porcine bone mix (OsteoBiol® *Putty*, Tecnoss®, Giaveno, Italy – granulometry up to 300 μm) (A) or prehydrated (40% collagen I/III) collagenated cortico-cancellous porcine bone mix (OsteoBiol® *Gel 40*, Tecnoss® - granulometry up to 300 μm). Animals were killed after 8 weeks for histological and morphometrical evaluations that evidenced that both materials showed a high degree of new bone formation, 42% and 46%, respectively, and clear signs of resorption at the time of animals sacrifice.

CONCLUSIONS

The present study clearly demonstrates that CPB with different collagen gel content induces bone formation in defects in rabbit bone and that resorption of the porcine bone particles takes place. The high presence of collagen might induce adhesion of both mesenchymal cells and osteoclasts to the surface of the material because these cells are shown to link to different proteins. Also, collagen has been shown to have a chemotactic and differentiation effect on mesenchymal stem cells.

On the basis of the findings of this study, the Authors concluded that *"CPB with different ratios of collagen exhibits good biocompatibility and osteoconductive properties. In this model, the two materials were equal with respect to both bone formation and resorption which had started at the endpoint at 8 weeks"*.

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