

OSSEOUS RESPONSE TO BOVINE HYDROXYAPATITE AND COLLAGEN SPONGE IN MEMBRANE PROTECTED DEFECTS

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ABSTRACT

The aim of this study was to assess the clinical and histologic response to bovine hydroxyapatite (osteograf/N 300) and collagen sponge in membrane protected calvarial defects as regards preserving the contour of the defects, quality and rate of bone formation. Twelve adult male rabbits were divided into two equal groups. Two osseous defects (right and left) of 10 mm diameter were made in the frontal bones of each rabbit. In group I, the left side defect was filled with osteograf/N and the right side defect served as a control. In group II, the left side defect was filled with collagen sponge and the right defect acted as a control. All defects were covered with absorbable collagen membranes (Biomend). Four animals (2 from each group) were euthanized after 3, 5 and 9 weeks and specimens were prepared and sent for histologic examination. Clinically, all animals healed uneventfully without complications, the defect in control sites showed partial collapse being filled only with blood, while group II showed partial collapse later due to resorption of the collagen sponge. On the other hand, group I showed stability of the defect surface throughout the experiment. Histologically, although osteograf/N had slow bone formation yet it was of good quality. Collagen sponge showed faster bone formation of low quality with large amount of woven bone until the ninth week. Particles of osteograf/N were seen throughout the experiment. The biocompatibility of both materials was confirmed, osteograf/N formed bone of better quality and maintained the restored defect dimensions. Osteograf/N may have potential for use in the reconstruction of oral and craniofaciomaxillary defects. Collagen sponge being biocompatible, with no deleterious effect on bone healing, has recently been used as a carrier for hr-BMP-2 to reconstruct bone defects and to restore osseous contours.

INTRODUCTION AND REVIEW OF LITERATURE:

Healing of bone defects depends on the osteogenic potential and the vascularity of the host bone, but is often limited by the size of the defect⁽⁷⁾. The critical size defect has been defined as the smallest intraosseous wound in a particular bone and species of animal that will not heal spontaneously during the life time of the animal⁽⁴⁵⁾. The ex-

act size of such a defect varies among authors for the calvaria of the adult rabbits, with a range from 7-15 mm in diameter^(1,16,27,34,35,36), the dimensions vary considerably not only between different species but also between different bones and their segments⁽⁷⁾.

Measures to promote bone formation such as osteoinduction, osteoconduction, callus distraction, and the utilization of barrier membranes all aim to

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