

BIOACTIVE GLASS IMPLANTATION OF MANDIBULAR DEFECTS A DIGITAL RADIOGRAPHICAL, HISTOLOGICAL AND HISTOCHEMICAL EVALUATION

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ABSTRACT

Purpose: This study was undertaken to evaluate the tissue response histologically, histochemically and by digital radiography to bioactive glass particulate to determine the optimum time for delayed dental implantation.

Materials and Methods: On both sides of the mandible of eighteen mongrel dogs, the two lateral incisors were extracted. The left sockets were immediately filled with bioactive glass particles. While the right sockets were left empty as control. Six animals were sacrificed at 4, 8 and 16 weeks postoperatively. The samples were then harvested and evaluated clinically, histologically, histochemically and by digital radiography.

Results: The bone densities in control and implanted sockets showed significant increase throughout the study intervals. While, no significant difference was found between the bone densities of both sockets. Histologically, the implanted sockets showed intensive osteoblastic activity. The newly formed bone in the implanted sockets was more organized than that of the control ones. In addition, the observed osteoclastic activity in the control sockets was not found in the implanted ones. Histochemical findings confirmed the histologic ones.

Conclusions: Based on our findings, it could be concluded that dental implantation could be performed after 8 weeks of bioactive glass implantation and that the bioactive glass particles do not only enhance osteogenesis but also organize its architecture.

INTRODUCTION

Implantology has become an established treatment modality for rehabilitation of dental arch. Intimate contact between dental implant and bone at the time of its placement is the main success-determining factor for its osseointegration. To achieve this objective, various types of bone grafts and alloplastic implants have been used to promote bone formation in osseous defects, either before or in conjunction with endosseous implant place-

ment.⁽¹⁻³⁾ The choice of the graft materials for this purpose is still empirical. However, there seems to be universal agreement that bone graft is by far the best grafting material.⁽¹⁻³⁾ Autografts and allografts are the most commonly used forms of bone grafts. However, the donor site morbidity as well as the limited supply are the major drawbacks of bone autografts. On the other hand, the slow revascularization, incorporation, and remodeling of the freeze-dried allografts has led to instances of

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