TOOTH TRANSFORMER

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Case Report

Comparison between the Bone Regeneration Using Tooth Graft with or without Tooth Transformer in Sheep

Elio Minetti[1]* and Andrea Palermo[2]

[1]University of Bari "Aldo Moro" Private Practice, Milano, Italy

[2]University of Bari "Aldo Moro" Associate Professor College of Medicine and Dentistry Birmingham, EnglandPrivate Practice, Lecce, Italy

Abstract

Introduction

Human dentin matrix can be successfully used for bone grafting procedure. It is well known that dentin grafts can induce osteoblasts proliferation. An innovative preparation method, using the dedicated automated device Tooth Transformer, which is able to transform autologous teeth in suitable grafting material, has been recently introduced. The aim of the present paper is to analyze the histologic outcomes in four hollow titanium cylinders 4.0-mm internal diameter and 8-mm length, termed "bone growing chambers" (BGC). BGC were inserted in two sheep mandibles: in the right side the BGC was filled by the tooth graft treated using a Tooth Transformer device while in the left side BGC was filled with tooth graft without any treatment (control group). After 2 months of healing the BGC were retrieved and histological analysis were performed.

Results

All titanium chambers were well osseointegrated after 2 months of healing. In the test group, newly formed bone mixed with tooth graft granules appeared incorporated in the new trabeculae and revealed no inflammatory or infective reactions against tooth graft. In the control group the tooth graft granules were not covered by new bone. This fact testified that the treatment using a new device (TT TOOTH TRANSFORMER SRL, Via Washington, 59 – Milan, Italy) is safe and increases the optimal bone response.

Discussion

Results from the present histological evaluation reveal that there are big differences between tooth grafts and they depend from the treatment performed. The success of the tooth graft treatment is established from the treatment performed.

Key Words: Tooth; Dentin Graft; Bone Regeneration

Introduction

The tooth grafting procedure has been introduced by Urist et al. more than 50 years ago, when they discovered the osteoinduction potential of demineralized dentin matrix [1-2].

It is clear that both bone and dentin matrix contained fundamental growth factors for bone regeneration. Dentin represent an efficient reserve of BMPs, bioactive growth factors (GFs), and transforming growth factor-B (TGF-B), which are well known to be involved in bone repairing processes [3]. Some authors theorized that the demineralization process allows better bone augmentation than non-demineralized dentin [4].

Demineralization is a required process to free growth factors and proteins, because the release of growth factors is blocked from the hydroxyapatite crystals [5].

The tooth graft without any treatment is contaminated and is not safe to use it in surgical procedure.

***Corresponding Author:** Elio Minetti, University of Bari "Aldo Moro" Private Practice, Milano,DDS, Viale Pisa 10, 20146 Milano, Italy, Tel/Fax: +3902404740; E-Mail: elio.minetti@gmail.com

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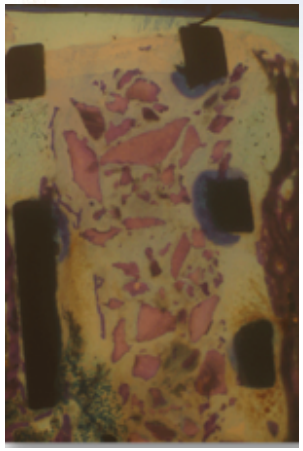

Fig. 1

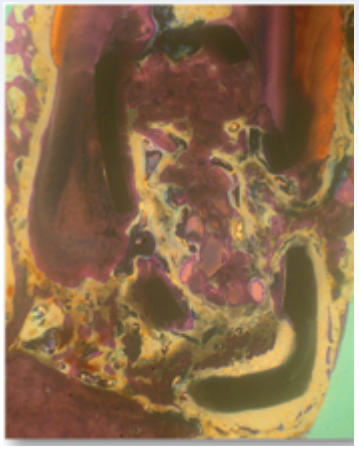

Fig. 2