

# TOOTH TRANSFORMER



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## RESEARCH ARTICLE

### A New Tooth Processing Apparatus Allowing to Obtain Dentin Grafts for Bone Augmentation: The Tooth Transformer

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#### Abstract

##### Introduction:

Human dentin matrix could be considered an excellent alternative to autologous or heterologous bone graft. Autologous tooth graft has been proposed since 1967 when the osteoinduction properties of autogenous demineralized dentin matrix were discovered.

##### Methods:

The preparation technique to transform autogenous teeth in suitable grafting material still represents the fundamental step of the whole procedure.

##### Aim:

The aim of the present study was to test an innovative medical device that could obtain tooth graft materials starting from the whole tooth of the patient. 15 consecutive cases of tooth grafting procedures were performed with a mean follow up period of 18 months.

##### Results:

In all cases, after 6 months of healing, the defects were almost completely filled by newly formed hard tissue. The new tissue was examined after 6 months, both from a radiological point of view by CBCT scans and from a clinical observation. It showed a compactness similar to the medium-density bone. No signs of inflammation were observed. No infective complications were recorded during the post-operative healing. No graft particles or granules were visible in the regenerated bone structure that appeared homogeneous and uniform.

##### Discussion:

The results of the present study showed favorable bony healing in guided regenerative surgery procedures using autogenous tooth graft. Future studies with long follow up period are needed in order to better evaluate the potential of demineralized dentin autografts.

**Keywords:** Bone regeneration, Tooth graft, Dentin matrix, Oral implantology, Dentin graft, CBCT.

#### Article History

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## 1. INTRODUCTION

Grafting materials are widely used for pre and peri-implant bone augmentation procedures from more than 35 years [1, 2]. The most commonly used graft materials are from animal origin, synthetic or human. In these cases, bone regeneration stimulation derives from the host organism and never from the donor, slowing or decreasing the regenerative potential. Autogenous bone graft is considered the gold standard for the

repair of alveolar bone defects, but it is associated with donor complications and morbidity and also suffers from a limited supply.

Formant tooth graft has been proposed since 1967, when Yonemasa and Urist [3] and Baig and Urist [4] demonstrated osteoinduction properties of autogenous demineralized dentin matrix: some years later, Kawanishi and Urist partially purified bone morphogenetic proteins of bovine dentin matrix [5].

The idea to use autogenous tooth as bone substitute in grafting procedure started from similar chemical composition between bone and dentin. Both of them consist, in fact, of 18% collagen, 2% proteins, 70% inorganic portion (hydroxyapatite),

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