



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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MONA MAGHRABY

Influence of Osseodensification Implant Site Preparation Method on the Resonance Frequency Analysis & Insertion Torque Values for Dental Implants

An Experimental Study in Dogs

Thesis submitted to the Faculty of Oral and Dental Medicine, Ain Shams University. In partial fulfillment of the requirements for Master Degree in Oral and Maxillofacial Surgery

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Dedication

*I wish to express my very profound gratitude to
my beloved family for providing me with
unfailing support and continuous
encouragement throughout my years of study
and through the process of researching and
writing this thesis*

Disclosure

This research is a part of a major research project that aimed to study the outcomes of osseodensification at both the biomechanical and histological levels.

This project has two arms; the first is purposed to evaluate the osseodensification effect of densah® burs on implant stability using peak insertion torque and resonance frequency analysis which will be thoroughly illustrated in this thesis.

The second arm of the project was aimed to evaluate the osseodensification effect of densah® burs on the osteotomy site via histological analysis of bone density and bone-implant contact of the osteotomy.

The second study was conducted by Mina William under the supervision of both Professor Dr. Heba Sleem and Dr. Karim Abdelmohsen, at the Faculty of Dentistry, Ain Shams University, and it is titled as "Histological Analysis of Bone Density and Bone Implant Contact Following Osseodensification Implant Site Preparation Method (An Experimental Study in Dogs)".

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List of Abbreviations

OD	Osseodensification
PIT	Peak Insertion Torque
RFA	Resonance Frequency Analysis
ISQ	Implant stability quotient
BIC%	Bone-Implant contact percentage
IV	Intravascular

Introduction

Introduction

In the last few decades, dental implants have been considered one of the most critical treatment lines for prosthodontic purposes and have recorded from a 90-95% success rate. Achievement of initial stability of the implant fixtures play the main role in obtaining long term clinical successful osseointegrated prosthesis. ⁽¹⁾

Quality and quantity of the osteotomy bone, surgical techniques, implant geometry, surface treatment, and implant dimensions are different factors that have a direct impact on implant primary stability. ⁽²⁾ Primary stability depends mainly on the increase in the frictional surface between the implant fixture and bone osteotomy site by enhancing the quality of bone in addition to the increasing amount of bone minerals. Therefore, increasing primary stability is usually followed by an acceleration of the osseointegration process. ⁽³⁾

Preparation of the osteotomy site is applied by different surgical techniques such as cutting drilling, osteotome, undersized drilling, and expander drills. These techniques are purposed to create sufficient room for the implant with maximum mechanical stability. Nevertheless, each of them has its limitations such as excavating bone during drilling. This could lead to decrease the bulk of bone or inducing fractures of the trabeculae with resultant long remodeling time and delayed secondary implant stability.

Osseodensification is a new non-extraction drilling technique that was introduced by Huwais in 2013 ^(4, 5) with specially designed burs to increase bone density. They expand the osteotomy site in addition to condense the bone minerals and matrix along the osteotomy walls. It is claimed that these burs

have advantages of bone condensation of osteotomes as well as the adequate control of the drilling procedures.

The purpose of the study is to validate the effect of osseodensification implant site preparation technique on the implant stability in comparison with conventional drilling preparation method.