بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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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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2020

Acknowledgments

I would like to express my sincere gratitude to my advisor Dr. ***Heba Abdelzwahed Sleem*** *Associate Professor of Oral and Maxillofacial Surgery Faculty of Dentistry Ain Shams University for the continuous support of my research, for her patience, motivation, enthusiasm, and immense knowledge. Her guidance and encouragement helped me in all the time during this research.*

I would also like to acknowledge Dr. ***Moustafa Mohammed Taha*** *Lecturer of Oral and Maxillofacial Surgery Faculty of Dentistry Ain Shams University as the second reader of this thesis. I am gratefully indebted to him for his very valuable comments on this thesis, his incredible help and his great suggestions.*

With many thanks to Dr. ***Karim Abdelmohsen****, Lecturer of Oral and Maxillofacial Surgery at the Faculty of Dentistry, Ain Shams University for his guidance during this research. He was the founder of this research idea and he was always willing and enthusiastic to assist in any way he could throughout the research project.*

Last but not least, my countless thanks and appreciation to Prof. ***Faisal Abdel Samad Mohamed Torad*** *Professor of Surgery, Anesthesiology and Radiology Faculty of Veterinary Medicine Cairo University for his patience with me and his generosity and constructive guidance to make this work well. I can hardly express my thanks for all what he did throughout the work.*

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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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.