Immediate Full Occlusal Loading of Dental Implants using Intra-oral Welding Technique Versus Conventional Immediate Loading.

A Comparative Split mouth Prospective Clinical Trial

Thesis

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By

Hebatallah Abdou El-said Abouelata Mattar

B.D.S.
Faculty of Dentistry
Misr International University (2011)

Faculty of Dentistry
Ain Shams University
2019

SUPERVISORS

Prof. Dr.Salah Abdel Fattah Ahmed Metwally

Professor of Oral and Maxillofacial Surgery

Faculty of Dentistry

Ain Shams University

Dr.Karim Mohamed Mahmoud AbdelMohsen

Lecturer of Oral and Maxillofacial Surgery

Faculty of Dentistry

Ain Shams University

بسم الله الرحمن الرحيم

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In the name of Allah, the Most Gracious and the Most Merciful

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Dedication

I dedicate this thesis to

My loving family and friends, my parents,
sister and brothers, her husband, their wives and children,
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LIST OF ABBREVIATIONS

BC : Before Christ

Dr : Doctor

IMZ : Intramobile Zylinder Implants

ITI : International Team for Implantology

ADA : American Dental Association

ICOI : International Congress of Oral Implantology

PES : Pink Esthetic Score

WES : White Esthetic Score

TPS :Titanium Plasma Spray

PIT : Peak Insertion Torque

RFA : Resonance Frequency Analysis

ISQ : Implant Stability Quotient

BIC : Bone to Implant Contact

MBL : Marginal Bone Levels

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INTRODUCTION

The rehabilitation of the partially edentulous arches with immediately loaded dental implants in cases when there are suitable bone volume and quality has been proposed by many authors [1, 2, 3.] Severe occlusal loads from the normal or paranormal chewing process have long threatened this treatment option and were always the fear of the surgeons choosing to work with this technique and were reported to be a main causative factor for implant failure[4].

However, to overcome the problem of early occlusal overload in immediate loading some authors suggested the modification of the immediate temporary restoration to avoid occlusal contact in centric and lateral excursions, thereby having a restoration to aid in chewing but with less mechanical stresses [1,5,6,7,8,9].

Using this modification, a study by Galli et al concluded that there were no statistically significant differences between immediate loading and conventional loading of dental implants taking into consideration peri-implant bone level and soft tissue measurements [3].

Yet another study by Degidi et al compared between immediate loading defined as full occlusal loading and immediate restoration defined as having the temporary prosthesis out of function in posterior partial edentulism providing the abutments were welded and found out that there was no statistically significant difference between the two groups [9].

One technique to achieve the temporary rehabilitation of the immediately loaded implants can be the surgical indexing technique which relies on having an index prepared from the study cast to be used to transfer the position of the implant, hence creating a master cast fabricated from the

study cast made before surgery. Followed by modifying it by indexing the proper position of the implant then transferring its relation to this cast for chair side construction of the temporary prosthesis [10].

Another technique of constructing the temporary restoration, also relying on indexing is to fabricate a stent and fill it with composite or acrylic based material after implant placement and abutment insertion and modifying the temporary restoration chair side[11].

Immediate full occlusal loading seems to be exceptionally appealing because it is nonnegotiable that if a patient was given a choice between receiving a restoration that is out of occlusion or given a restoration that provides for full occlusal loading, no doubt the patients would prefer to have their teeth and restorations in full occlusion since the first day of chewing after surgery. And so According to a recent study, a technique that may provide this treatment option with no statistically significant difference between it and conventional non occlusal loading is: using the intra-oral welding system, to splint immediately the implants placed, that allows for fabrication of full occlusal loading restorations [9].

For this reason, the use of intra-oral welding after immediate implant placement has been suggested in the literature for immediately splinting placed implants thus reducing mechanical stresses placed over the implants and allowing the provision of a full occlusal loaded restoration with comparable results as regards to soft and hard tissue values[12-21].

REVIEW OF LITERATURE

History:

When a natural tooth is lost for one reason or another the patient becomes in a stressful situation due to having insecurities as a result of poor aesthetics or deficient function or speech. Hence the sensible inevitable solution should be to replace this lost tooth or teeth. The idea of replacing missing natural dentition as part of Oral Rehabilitation is not a recent one. Since there was life on earth many trials have been attempted, some of which were very primitive, and others led the way to the innovation of dental implants.

As far as history can recall several attempts were made to try to preserve the natural dentition. According to Abraham CM in 2014, to begin with, our ancestors of Ancient Egypt, back in 2500 BC (before Christ) made one of the first attempts ever to stabilize periodontally hopeless teeth by utilizing gold ligature wires [22]. They were followed shortly after that at 500 BC by the Etruscans who created "soldered Gold Bands" out of animal sources to rehabilitate the dental arches. Later at 300 BC the Phoenicians stabilized loose teeth using gold wires and even used these wires to stabilize a tooth carved out of ivory as if making a fixed bridge when a natural tooth was missing. However, the creation of dental implants can be first attributed to the "Mayan Population" not before 600BC were they made dental implants out of sea shells to replace mandibular teeth, and in the 1970's radiographs of these "Mayan Mandibles" amazingly revealed compact bone around these sea shell Dental implants that resembled very much that seen around modern dental implants as what was elaborated also by Pal TK in 2015 [23].

Not only that, but according to Gaviria et al in 2014, after the Mayan population, later around 800AD a similar attempt was made by the "Honduran