



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

∞∞∞∞

تم رفع هذه الرسالة بواسطة /صفاء محمود عبد الشافي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون

أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد



**The Effect of Early Versus Delayed
Loading on the Stability of Implants
Placed by Transalveolar
Augmentation Using PRGF in Partially
Edentulous Maxilla**

*A Thesis Submitted to the prosthodontics department
Faculty of Dentistry
Ain Shams University in Partial Fulfilment
of the Requirements for the Master Degree
in Oral and Maxillofacial Prosthodontics*

By

Mahmoud Anwar Eltaweel

B.D.S, Alexandria University (2012)

Faculty of Dentistry
Ain Shams University

2022

Under Supervisors

Prof. Dr. Marwa Ezzat Sabet

*Professor of Oral and Maxillofacial Prosthodontics
Faculty of Dentistry, Ain Shams University*

Dr. Marwa Kothayer

*Associate Professor of Oral and Maxillofacial Prosthodontics
Faculty of Dentistry, Ain Shams University*

Dr. Ahmed Mostafa

*Lecturer of Oral and Maxillofacial Prosthodontics
Faculty of Dentistry, Ain Shams University*

2022

Dedication

*To my beloved family for
their endless help and
support.*

*My little family : Rana and
Yahia .*



Acknowledgement

*I would like to express my most sincere gratitude and appreciation to **Dr. Marwa Ezzat Sabet**, Professor of the Oral and Maxillofacial Prosthodontics Department, Faculty of Dentistry, Ain Shams University, for her generous support, faithful supervision and valuable guidance throughout the whole study.*

*I would also like to thank **Dr. Marwa Kothayer**, Associate Professor of Oral and Maxillofacial Prosthodontics, Faculty of Dentistry, Ain Shams University, for her remarkable help, valuable advice, constant support and encouragement during the course of this study.*

*I am greatly honored to express my deepest gratitude to **Dr. Ahmed Mostafa**, Lecturer of Oral and Maxillofacial Prosthodontics, Faculty of Dentistry, Ain Shams University, for his continuous encouragement, humanity, patience, time, endless support and guidance. His valuable experience and honorable supervision will always be remembered with a lot of gratitude.*

Last but not least, I would like to express my gratitude to all my friends . For dr Yara Mahdy , I will always be grateful for your endless support and enthusiasm .

✍ **Mahmoud Eltaweel**

The Effect of Early Versus Delayed Loading on the Stability of Implants Placed by Transalveolar Augmentation Using PRGF in Partially Edentulous Maxilla

Abstract

Abstract: Purpose :to assess the effect of custom made fiber post for restoring himesected lower first molar and the most post system have fracture resistance to mastication load among cast metal post and and a customized fiber post (EVERSTICK POST) after restoration by 3units FPD. **Methods:** A total of sound fourty extracted lower molars and fourty sound extracted lower premolar will be collected. Extracted human lower molars were hemisected and restored with a everstick post) with composite core and SECOND group with cast metallic post-core. Each group was subdivided into two subgroups. In supgroups 1, the posts were cemented with total etch resin cement .In subgroup 2 , the posts were cemented by self adhesive resin cement. The distal root of molars and premolar were prepared by C.N.C milling machine. Metal full coverage bridges fabricated for restoring the resected mesial root on the distal root and premolar as abutments. A 90-degree vertical was applied to the restored teeth with a crosshead speed of 0.5 mm/min,with spherical tip had a diameter of 5.8 mm. and the fracture loads and mode of fracture were recorded **Results:.** Under the condition of vertical loading, the fracture load of teeth restored with the ever stick post-with composite was greatest among the groups (two-factor factorial ANOVA and $P<0.05$). All fractures in teeth restored with metallic post of post-core systems propagated in the middle portions of roots, including the apices of the posts. The fracture load of teeth restored with pre-fabricated metallic posts was significantly smaller than that in other groups. Most of fractures in the fiber post group propagated within the cervical area, while most fractures in other groups extended beyond the middle of the roots. **Significance.** From the results of the present investigations, it was concluded that under the conditions of vertical loadings, the combination of a custom made fiber post and composite resin core with a full cast bridges is most protective restoration of the hemisected lower molar.

Keywords: Early, Delayed Loading, Transalveolar Augmentation, PRGF.

Table of Contents

Subject	Page No.
List of Abbreviations	I
List of Figures	III
List of Tables	IV
Introduction.....	1
Review of Literature.....	3
Aim of the Study	38
Materials and Methods.....	39
Results	60
Discussion	66
Summary	72
Conclusion	74
Recommendation.....	75
References	76
Arabic Summary.....	---

List of Abbreviations

Abb.	Full Term
BAOSFE	Bone-added osteotome sinus floor elevation
BFGF	Basic fibroblast growth factor
BIC	Bone implant contact
CBCT	Cone beam computed tomography
EGF	Epithelial cell growth factor
FPD	Fixed partial denture
GBR	Guided bone regeneration
HA	Hydroxi apatite
ISQ	Implant stability quotient
IT	Insertion torque
LPRP	Leukocyte and Platelet Rich Plasma
MMC	Maxillary major connector
MSFA	Maxillary sinus floor augmentation
OMSFE	Osteotome maxillary sinus floor elevation
PAF-4	Platelet activating factor-4
PDGF	Platelet-derived growth factor
PPP	Platelet-poor plasma
P-PRP	Pure Platelet-rich plasma
PRF	Platelet-rich fibrin
PRGF	Plasma Rich in Growth Factors
PRP	Platelet-rich plasma
RBC	Red blood cells
RFA	Resonance frequency analysis

Abb.	Full Term
RPD	Removable partial denture
SFE	Sinus floor elevation
TCP	Tricalcium phosphates
TGF-β	Transforming growth factors
VEGF	Vascular endothelial growth factor
WBC	White blood cells

List of Tables

Table	Title	Page
I	Mean, standard deviation, P value of Anova test for the effect of time on implant stability in early loading group (Group I)	60
II	Mean, standard deviation and P value of Anova test for the effect of time on implant stability in delayed loading (Group II)	61
III	Mean, standard deviation and P value of Anova test for the implant stability in both groups at different time intervals	63

List of Figures

Figure	Title	Page
1	Pre-operative CBCT	43
2	Extraction of blood sample	
3	TD5 centrifuge and incubator	44
4	Blood sample in sodium citrate tubes	44
5	Blood sample in centrifuge	45
6	Blood sample after centrifuge preparation	46
7	Sample after aspiration of superficial layer of plasma	46
8	Preoperative view	47
9	Flap retraction	48
10	Osteotomy was done using sequential drills below the sinus floor about 2 mm	49
11	PRGF plug	49
12	PRGF plug mixed with bone graft	49
13	The implant was introduced into the osteotomy and screwed with finger driver	50
14	Smart peg was screwed to the implant then ostell probe was used to record the readings	51
15	Readings from the screen of the ostell	51
16	The smart peg was unscrewed and replaced by cover screw	52
17	Suturing was done	52
18	Post-operative panorama	
19	Primary Impression	54

20	Study cast obtained from primary impression	55
21	Special tray construction	55
22	Secondary impression	55
23	Metal framework on master cast	57
24	Record block	57
25	Heat cured acrylic resin denture	57
26	Rubber sheet to block the undercut found in the neck of the ball head	58
27	Curing of auto polymerizing acrylic resin while patient teeth in occlusion	58
28	Metal housing in the fitting surface of denture	58
29	Bar chart shows Effect of time on implant stability in early loading (Group I)	61
30	Bar chart shows Effect of time on implant stability in delayed loading (Group II)	62
31	Difference in implant stability between both groups at the time of implant insertion, at time of loading (6 weeks for group I and 24 weeks in group II), 3 months after loading and 6 months after loading	65

Introduction

Loss of teeth compromises lifestyle and leads to several clinical challenges. Drifting and tilting of adjacent teeth, changes in facial appearance, altered speech, supra eruption of the opposing teeth and tempo-mandibular joint disorders are all results of partial edentulism. The continuous loss of bone, as well as movement of adjacent and opposing teeth makes the restoration of the edentulous area with a proper restoration difficult.

Fixed partial dentures (FPDs), removable partial dentures (RPDs), over dentures and implant prosthesis are all options for replacing missing teeth and supporting structures in partially edentulous patients.

Implant placement in posterior maxilla encountered some limitation. Sinus pneumatization and bone resorption after teeth extraction result in decrease in available bone and this lead to limited length of implant. Sinus lifting in two ways by transcrestal approach or lateral approach is usually the method to follow to create adequate space for the implant.

A combination of autogenous particles and graft material are added through the osteotomy in floor augmentation. These materials are osteogenic, osteoconductive, osteoinductive or have combination of these properties. One of these materials is the plasma rich in growth factors (PRGF).

The loading for the final prosthesis is done after six months to allow the osseointegration to occur between implant and bone and

this is known as delayed loading protocol. On the other hand there are two main different protocols aiming to decrease the time till loading of the final prosthesis. Immediate loading within the first two weeks after surgery or early loading after at least one month and before the six months period. Thus this thesis is promoted to answer the debate related to the effect of addition of PRGF material with transalveolar sinus lifting on implant stability and whether it promotes early loading or not.