



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكرو فيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



MONA MAGHRABY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغييرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



MONA MAGHRABY



COMPARISON OF THE EFFECT OF DIFFERENT IMPLANT CONNECTIONS ON STRESS DISTRIBUTION AROUND DENTAL IMPLANTS (IN VITRO STUDY)

A Thesis submitted to department of oral Medicine,
Periodontology, Oral Diagnosis and Radiology for partial
fulfillment of the requirements for the master's degree in
Periodontology

Submitted by
Moustafa Mahmoud Soliman

B.D.S Faculty of Dentistry, Alexandria University, 2012

SUPERVISORS

Prof. Dr. Nevine Hassan Kheir El Din
Professor of Oral Medicine, Periodontology and Oral Diagnosis
Faculty of Dentistry, Ain Shams University

Dr. Mohamed Wagdy Bissar
Lecturer of Oral Medicine, Periodontology and Oral Diagnosis
Faculty of Dentistry, Ain Shams University

Faculty of Dentistry, Ain Shams University

2020

ACKNOWLEDGEMENT

*I wish to express my sincere admiration and awe to **Prof. Dr. Nevine Hassan Kheir El Din**; Professor of Oral Medicine, Periodontology and Oral Diagnosis, Faculty of Dentistry, Ain Shams University, for her patience, motivation, enthusiasm, and immense knowledge. Her guidance helped me throughout the writing of this thesis. I could not have imagined having a better advisor and mentor for my Master's study. And for the chance she gave me to approach this research. Also, for her devoting much of her time and effort in the supervision of the thesis.*

*A special thanks goes to **Dr. Mohamed Wagdy Bissar**; Lecturer of Oral Medicine, Periodontology and Oral Diagnosis, Faculty of Dentistry, Ain Shams University, for his remarkable help, advice and precious time spent reviewing my papers.*

I would also like to express my gratitude to all the staff of Oral Medicine, Periodontology and Oral Diagnosis and Radiology department, for their assistance and guidance.

*My deepest gratitude to **Kamal Ghamry Metwally**; Associate Professor, Civil Engineering Department, Faculty of Engineering, Beni-Suef University for his sincere efforts. We could not have completed our research without his efforts.*

*I would also like to acknowledge my friends and colleagues the unknown soldiers behind this thesis, on the top of the list: **Dr. Doaa Adel, Dr. Heba Youssef, Dr. Rania Ehab and Dr. Hussien Ezz**. I could not have done it without their support.*

Last but not least, my lovely wife and supportive Family.

List of Contents

Title	Page No.
List of Tables.....	iii
List of Figures	iv
List of Abbreviations.....	vii
I. Introduction.....	1
II. Review of Literature	2
III. Aim of the Study	31
IV. Materials and Methods.....	32
V. Results	41
VI. Discussion	53
VII. Summary.....	62
VIII. Conclusions.....	64
IX. Recommendations.....	65
X. References.....	66
Arabic Summary	

LIST OF TABLES

Table	Title	Page
1	Nodes and elements of each component	36
2	The properties of the different materials used throughout this study	37

LIST OF FIGURES

Figure no.	Title	Page no.
1	Different colors indicate the amount of stress around the peri-implant region and prosthetic structure.	20
2	Internal Hex versus Morse taper.	32
3	1st configuration, no bone defect.	33
4	2nd configuration, vertical bone defect.	34
5	The screw inserted into the bone (1st configuration).	34
6	The screw inserted into the bone (2nd configuration).	35
7	Oblique direction of forces.	38
8	Axial direction of forces.	38
9	Axial and oblique direction of forces.	39
10	Stress distribution on the abutment from low to high.	40
11	Stress level on the bone.	42
12	ANSYS stress distribution on bone map with a color scale where (a)Axial force on Morse taper in bone defect model, (b) Combination of oblique and axial forces on Morse taper in bone defect model, (c) Oblique force on Morse taper model in bone defect model, (d) Axial force on internal hex model in bone defect model, (e) Combination of oblique and axial forces on internal hex modelin bone defect, (f) Oblique force on internal hex model in bone defect, (g) Axial force on Morse taper without bone defect model, (h) Combination of oblique and axial forces on Morse taper without bone defect model, (i) Oblique force on Morse taper model without bone defect model, (j) Axial force on internal hex model without bone defect model, (k) Combination of oblique and axial forces on internal hex model without bone	43

Figure no.	Title	Page no.
	defect (l) Oblique force on internal hex model without bone defect.	
13	stress levels on the abutments.	45
14	ANSYS stress distribution on abutment with a color scale where (a) Axial force on Morse taper in bone defect model, (b) Combination of oblique and axial forces on Morse taper in bone defect model, (c) Oblique force on Morse taper model in bone defect model, (d) Axial force on internal hex model in bone defect model, (e) Combination of oblique and axial forces on internal hex model in bone defect, (f) Oblique force on internal hex model in bone defect, (g) Axial force on Morse taper without bone defect model, (h) Combination of oblique and axial forces on Morse taper without bone defect model, (i) Oblique force on Morse taper model without bone defect model, (j) Axial force on internal hex model without bone defect model, (k) Combination of oblique and axial forces on internal hex model without bone defect (l) Oblique force on internal hex model without bone defect.	46
15	stress levels on fixture.	48
16	ANSYS stress distribution on fixture with a color scale where (a) Axial force on Morse taper in bone defect model, (b) Combination of oblique and axial forces on Morse taper in bone defect model, (c) Oblique force on Morse taper model in bone defect model, (d) Axial force on internal hex model in bone defect model, (e) Combination of oblique and axial forces on internal hex model in bone defect, (f) Oblique force on internal hex model in bone defect, (g) Axial force on Morse taper without bone defect model, (h) Combination of oblique and axial forces on Morse taper without bone defect model, (i) Oblique force on Morse taper model without bone defect model, (j) Axial force on internal hex model without bone defect model, (k) Combination of	49

Figure no.	Title	Page no.
	oblique and axial forces on internal hex model without bone defect (l) Oblique force on internal hex model without bone defect.	
17	Stress levels on the screw.	51
18	ANSYS stress distribution on screw map with a color scale where (a) Axial force on Morse taper in bone defect model, (b) Combination of oblique and axial forces on Morse taper in bone defect model, (c) Oblique force on Morse taper model in bone defect model, (d) Axial force on internal hex model in bone defect model, (e) Combination of oblique and axial forces on internal hex model in bone defect, (f) Oblique force on internal hex model in bone defect, (g) Axial force on Morse taper without bone defect model, (h) Combination of oblique and axial forces on Morse taper without bone defect model, (i) Oblique force on Morse taper model without bone defect model, (j) Axial force on internal hex model without bone defect model, (k) Combination of oblique and axial forces on internal hex model without bone defect (l) Oblique force on internal hex model without bone defect.	52

