



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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MONA MAGHRABY

**STRESS ANALYSIS OF TWO DIFFERENT ATTACHMENTS
FOR A SINGLE IMPLANT RETAINED MANDIBULAR
OVERDENTURES IN THE MIDLINE**

(Invitro Study)

A thesis submitted to the Faculty of Dentistry at Cairo University in partial fulfillment of the requirements for the degree of masters in Oral Implantology

Ahmed Hasanin Mohammed Rashad

(Al Azhar University) B.D.S 2009

Faculty of Dentistry

Cairo University

2020

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We certify that we have read the present work and that in our opinion it is fully adequate in scope and quality as thesis towards the partial fulfillment of the **(Master Degree)** requirements in **(Oral Implantology)**. From

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DECLARATION

I, Ahmed Hasanin Mohamed Rashad

Declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

“Stress analysis of Two Different Attachments for a Single Implant Retained Mandibular Overdenturs in the Midline”

I confirm that:

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Ahmed Hasanin Mohamed Rashad

ABSTRACT

Ahmed Hasanin Mohamed Rashad; Stress Analysis of Two Different Attachments for a Single Implant Retained Mandibular Overdenture in the Midline

Under supervision of:

Hamdy Abo Elfotouh Hamed,

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Aim: The aim of this in vitro study is to record the induced micro-strain around one installed implant in the midline of a completely edentulous mandible using strain gauges utilizing an implant retained overdenture with two different types of attachments Ball and CMLOC attachment.

Methodology : An acrylic resin test resin test model representing a completely edentulous lower arch was used The distal part of the residual ridge was covered with silicon based soft liner to stimulate the mucopcriostcum. Steps of complete denture fabrication was followed in conventional manner .Duplication of the finished denture was carried out to be used as a surgical stent .A single implant installed in the midline.After the implant was installed in the acrylic resin cast, the ball attachment was screwed to the implant. The denture was prepared for the direct pick up procedure, the same procedure repeated for CM IOC attachment. Four strain gauges around were installed on all surfaces of implant (Buccal. Lingual. Mesial .Distal) to monitor the effect of the applied loads vertical on the two types of attachments. A vertically load applied of 100 N static load was applied by using universal testing machine at three different sites (unilateral right first molar central fossa, left first molar and bilaterally.

Results : When the load applied on the right side and left side ,it was shown that the single implant retained overcdenture with ball the attachment has shown higher microstrain than the CMLOC ,average microstrain for CMLOC (222.23) N ,and for Ball (394.64) N for right side, for left side average, microstrain for Ball (391.26) N , and for CMLOC (223.22) N . When the load applied bilaterally, the single implant retained overcdenturc with the CMLOC (269.05)N attachment has shown higher microstrain than the Ball (106.79).

Conclasion: It can be concluded from this invitro study that the newly introduced attachment the CMLOC lends to show a better performance with regards to the micro-strains induced around the implants and also regarding improving the stability of the denture . On the other hand the ball attachments tends to show more micro-strain around the implants.

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Ahmed Hasanin Mohamed Rashad

Dedication

This thesis is dedicated to my beloved family, especially spirit of my father, my mother, my wife, my daughters my brothers and my sisters. I couldn't have carried out this work without their love, affection and prayers.

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