

# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني 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 تغيرات



## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار





# بعض الوثائق الأصلية تالفة







بالرسالة صفحات  
لم ترد بالأصل



B I A . C C

**Supervisors**

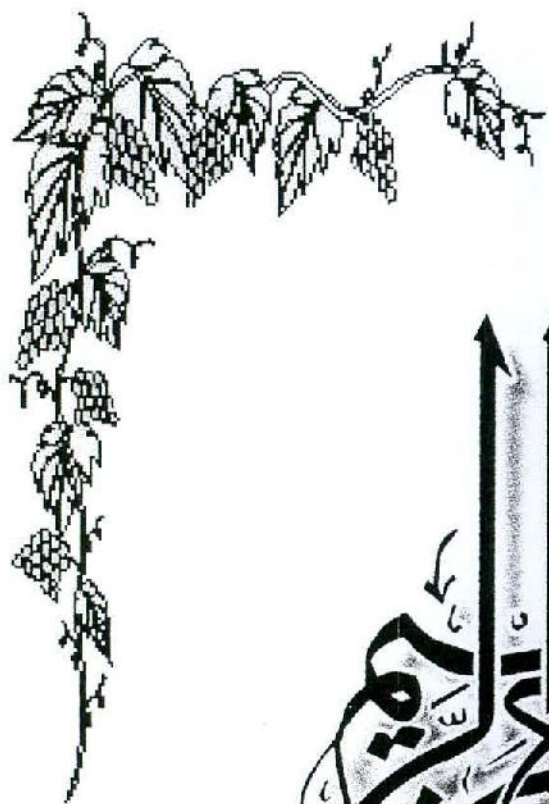
***Prof. Dr. Samira Ibrahim Ibrahim***

Professor of Prosthodontics  
Faculty of Oral & Dental Medicine  
Cairo University

***Dr. Khaled Taymour Shaker***

Lecturer of Prosthodontics  
Faculty of Oral & Dental Medicine  
Cairo University

For No  
Signature



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَقُلْ هُوَ اللَّهُ أَحَدٌ  
لَا إِلَهَ إِلَّا هُوَ  
الْحَيُّ الْقَيُّومُ  
لَا يَظُنُّ غَيْبٌ شَيْئًا  
عِنْدَ اللَّهِ إِلَّا بِمَا هُوَ  
بِشَرِّهِ يَوْمَ تَكُونُ  
السَّمَاوَاتُ دُخَانًا  
وَتَكُونُ الْجِبَالُ كَالْعِهْنِ  
الْمَنْقُوشِ





Dedicated To



*The Soul of My Father  
&  
to My Family*



## Acknowledgement

Words will never be enough to express how I am deeply thankful to ALLAH. It was his blessings that made this work be accomplished.

I would like to express my most sincere gratitude and grateful appreciation to Prof. Dr. Samira Ibrahim, Department of Prosthodontics, Faculty of Oral and Dental Medicine, Cairo University. I was fortunate to conduct this work under her valuable supervision. Her sincere support, guidance, continuous encouragement and constructive comments will always be remembered.

Words can never express how grateful I am to Prof. Dr. Zeinab Abd El Salam, Head of Radiology Department, Faculty of Oral and Dental Medicine, Cairo University, who guided me in a very generous manner throughout the radiographic evaluation. I can never forget her great co-operation, sincere help and valuable effort. Without her, I would have never accomplished a very important section in this study.

I am greatly indebted to lecturer, Dr. Khaled Taymour, Department of Prosthodontics, Faculty of Oral and Dental Medicine, Cairo University for the time he devoted and for his precious help, endless encouragement, guidance and ample cooperation.

I would like to thank Dr. Amany Rabah for her valuable efforts in carrying out the statistical analysis of this study.

Many thanks are also extended to Mr. Mohammed Gawish and Mr. Mohammed Abd El-Gayed, for their great co-operation and kind help during the laboratory part of this study.

I would like to thank my colleagues and all the staff members of the Prosthodontic Department, Faculty of Oral and Dental Medicine, Cairo University, who continuously encouraged me throughout this study.

Last but not least, I wish to express my gratitude to my patients. Without their willing co-operation, this work would not have been possible.

*Amal*

## Contents

	<i>Page</i>
* <b>Introduction</b> .....	1
* <b>Review of Literature</b> .....	3
* <b>Aim of the Study</b> .....	48
* <b>Materials &amp; Methods</b> .....	49
* <b>Results</b> .....	83
* <b>Discussion</b> .....	102
* <b>Summary &amp; Conclusions</b> .....	111
* <b>References</b> .....	114
* <b>Appendices</b>	
* <b>Arabic Summary</b>	



## List of Tables

	<i>Page</i>
Table 1 : Effects of group and time on gingival index scores .....	85
Table 2 : Effects of group and time on probing depth .....	88
Table 3 : Effects of group and time interval on bone height .....	91
Table 4 : Effect of site of measurement on bone height .....	94
Table 5 : Effects of group and time interval on bone density .....	97
Table 6 : Effect of site of measurement on bone density .....	100

## List of Figures

	<i>Page</i>
Fig. 1a : Flexi-overdenture Post .....	32
Fig. 1b : ParaPost-XP Post .....	32
Fig. 2 : Prepared abutments (group I) .....	53
Fig. 3 : Lower secondary impression .....	53
Fig. 4 : Flexi-overdenture attachment kit (6 No. 1 overdenture posts, 6 attachment caps, 1 primary reamer, 1 OVD countersink drill) .....	55
Fig. 5 : Flexi-overdenture post and nylon cap, primary reamer, countersink drill and the Flexi-overdenture wrench (from left to right).....	56
Fig. 6 : The Flexi-overdenture primary reamer that was used to prepare the full length of the post hole .....	58
Fig. 7 : The countersink drill that was used to prepare the coronal portion of the post preparation .....	58
Fig. 8 : Cemented Flexi-overdenture posts .....	59
Fig. 9 : Blocked out undercuts under the post heads .....	59
Fig. 10 : Mandibular overdenture fully seated in the patient's mouth after preparation of the holes .....	61

Fig. 11	:	Self curing acrylic resin applied in the dry holes of the denture base .....	61
Fig. 12	:	The fitting surface of the overdenture showing the picked up nylon caps .....	62
Fig. 13	:	The finished and polished overdenture in the patient's mouth .....	62
Fig. 14	:	Prepared abutments (group III) .....	63
Fig. 15	:	ParaPost XP system P-781, casting technique kit [impression posts (25 pcs), temporary posts (25 pcs), burnout posts (25 pcs) and ParaPost X drills (7 pcs)] .....	64
Fig. 16	:	Prepared abutments after preparation of the postholes and the two retention slots .....	66
Fig. 17	:	Post impression .....	66
Fig. 18	:	OT-cap attachment castable ball pattern kit (4 nylon liners, 2 positioning rings, 4 housings and 4 castable ball patterns) .....	67
Fig. 19	:	Close-up of the OT-cap attachment (from top to bottom: metallic housings, nylon caps and castable balls) .....	67
Fig. 20	:	Try-in of the post and coping assembly in the patient's mouth .....	69
Fig. 21	:	Cemented post and coping assemblies .....	69
Fig. 22	:	Fitting surface of the overdenture showing the picked up metal housings and the nylon caps .....	73
Fig. 23	:	Probing depth measurements using Williams graduated probe .....	73
Fig. 24	:	The DIGORA computerized system .....	74
Fig. 25	:	The Rinn XCP periapical film holder .....	74
Fig. 26	:	Radiographic acrylic template on the cast .....	77
Fig. 27	:	Linear measurement of bone height .....	79
Fig. 28	:	Close-up of bone height measurements .....	79
Fig. 29	:	Linear bone density measurement .....	80
Fig. 30	:	Close-up of bone density measurements.....	80



Fig. 31	:	Changes in gingival index scores (effects of group and time) .....	86
Fig. 32	:	Changes in probing depth (effects of group and time) .....	89
Fig. 33	:	Changes in bone height after 6 months (effects of group and site) .....	92
Fig. 34	:	Changes in bone height after 9 months (effects of group and site) .....	92
Fig. 35	:	Changes in bone height in group I (effects of time and site) .....	95
Fig. 36	:	Changes in bone height in group II (effects of time and site) .....	95
Fig. 37	:	Changes in bone height in group III (effects of time and site) .....	95
Fig. 38	:	Changes in bone density after 3 months (effects of group and site) .....	98
Fig. 39	:	Changes in bone density after 6 months (effects of group and site) .....	98
Fig. 40	:	Changes in bone density after 9 months (effects of group and site) .....	98
Fig. 41	:	Changes in bone density in group I (effects of time and site) .....	101
Fig. 42	:	Changes in bone density in group II (effects of time and site) .....	101
Fig. 43	:	Changes in bone density in group III (effects of time and site) .....	101



# *Introduction*



## **Introduction**

Overdenture treatment is considered a valuable and valid approach to preventive prosthodontics. Overdentures help to decrease the rate of alveolar bone resorption, improve vertical support, retention and stability. They also maintain the proprioceptive guidance by the retained roots. All these advantages are reflected on the psychological condition of the patient <sup>(1)</sup>.

Overdentures may be of the conventional type (with no mechanical means of retention) or of the retentive type (with attachments)<sup>(2)</sup>. Attachments are mechanical interlocking devices of different designs. Stud attachments are snap fasteners that are mainly used for overdenture support, retention and stability <sup>(3)</sup>.

Despite their advantages, it has been proved that incorporating attachments in a prosthesis induces more stresses to the supporting structures <sup>(4)</sup>. Several stud attachments are available, however, the resilient ball and socket type appears to transfer the stresses in a more favourable manner to the remaining structures <sup>(1)</sup>.

Several studies compared different designs of stud attachments regarding the amount of stresses they transmit to the supporting structures of the abutments. However, these studies concentrated on the extraradicular portion of the male component <sup>(4, 5)</sup>.

Recently, with the advent of different post designs, it was necessary to cast light on the effect of the intraradicular portion of the male component (post) on the supporting structures of the abutment teeth.