شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

HANAA ALY

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 تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Marginal Integrity and Fracture Resistance of Endocrowns Restoring Maxillary Premolars using Different Materials
(An In Vitro Study)

Thesis

Submitted to Fixed Prosthodontics Department Ain Shams University for the Partial Fulfillment of the Requirements of the Master Degree of Science in Fixed Prosthodontics

By

Omar Tarek Farouk Abd El-Hady

BDS Faculty of Dentistry, Mansoura University (2014)

Email: otaikot@gmail.com

Phone number: 01094422611

Faculty of Dentistry
Ain Shams University

2021

Supervisors

Dr. Marwa Mohamed Wahsh
Assistant Professor of Fixed Prosthodontics
Faculty of Dentistry, Ain Shams University

Dr. Ahmed Khaled Aboelfadl
Assistant Professor of Fixed Prosthodontics
Faculty of Dentistry, Ain Shams University

Acknowledgments

First and foremost, I feel always indebted to ***Allah*** *the Most Beneficent and Merciful.*

No words can express my deepest thanks and sincere gratitude as well as appreciation to ***Dr. Marwa Mohamed Wahsh,*** *Professor of Fixed Prosthodontics, Ain Shams University, who provided me with every support and helped me through every part in my clinical and academic career and gave me all the help and support*

I want to express my profoundest gratitude to ***Dr. Ahmad Khaled Abo El-Fadl****, Assistant Professor of Fixed prosthodontics, Faculty of Dentistry, Ain Shams University. From finding an appropriate subject in the beginning, to the process of writing the thesis, Dr. Ahmed offered his unreserved help, guidance, good advice, support and friendship.*

Finally, Words cannot express enough thanks to whole staff members in department of fixed Prosthodontics for helping me from the beginning of this project and throughout my work in the department.

Special thanks to ***Mr. Mahmoud Rashed*** *and* ***Alaqsa dental lab and technology*** *for their efforts and help in the practical steps in this thesis.*

Omar Tarek Farouk Abd El-Hady

Dedication

This work is dedicated to

My dear grandparents,

Precious parents and sister and

My Beloved uncles

List of Contents

List of Tables

List of Figures

List of Figures cont...

List of Figures cont...

INTRODUCTION

The conventional restoration protocol for endodontically treated teeth with excessive coronal loss has been metal post and core followed by a complete crown. [(1)] Initially, the post was thought to reinforce the remaining tooth structure.[(2)] Previous studies have reported adequate clinical post adhesion to tooth structure, [(3)] whereas others have shown variable results with high incidences of root fracture, indicating that excessive removal of tooth structure to place a post further weakens the root.[(4)]

Teeth with excessive coronal loss can be restored with the use of the endocrown [(5)]. The advances in adhesion, made endocrowns a good treatment alternative for teeth with short clinical crowns and calcified, short, or curved root canals that make post and core restorations impossible.[(6)] The monoblock nature of endocrowns would support more stress loading than the multi-interfacial nature of conventional restorations. [(7)] In addition, Endocrowns can also be used in patients with limited interocclusal space, which prevents adequate thickness for both the ceramic veneer and the metal or ceramic framework. [(8)]

Previous studies suggested that endocrowns may perform similarly or better than the conventional treatments using intra-radicular posts, direct composite resin or inlay/onlay restorations. [(9)] However, the question that remains to be answered is the suitability of endocrowns to restore endodontically treated maxillary premolars, due to the decreased surface of adhesion together with the unfavourable ratio between crown base and crown height which might cause high moment of force.[(10)]

Maxillary premolars play a very important role in esthetic appearance due to their strategic location in oral cavity[11], so that matching color between indirect restorations and remaining premolar structure play an important role in esthetic appearance of the patient.

The materials of choice for the fabrication of endocrowns have been reinforced, acid etchable monolithic ceramics because they provide mechanical strength enough to withstand occlusal tooth load and adequate bond strength to tooth structure. [12] In patient with high esthetic demand bilayered systems are commonly used with an inner layer of high-strength core ceramic and an outer layer of esthetic veneering ceramic. The load-bearing ability of a bilayered ceramic crown is widely assumed to be lower than monolithic ceramic ones.[14]

The addition of veneering porcelain to lithium disilcate cores was supposed to decrease the fatigue strength, however recent theoretical work suggests that it is actually the total ceramic thickness and not the core thickness only that is the significant determinant of load-bearing ability. This implies that if a constant total thickness of ceramic is maintained, the ratio of the esthetic porcelain instead of the stronger core porcelain can be increased without reducing the load-bearing ability of the ceramic crown.[15] Furthermore, the addition of veneering porcelain over lithium disilicate core can increase overall strength of bilayered lithium disilicate ceramics.[16]

BioHPP is a biopolymer material containing 20% ceramic fillers was introduced with good mechanical properties and excellent biocompatibility.[17] The major advantage of this modified PEEK material